GOVERNMENT POLYTECHNIC NASHIK

(AN ACADEMICALLY AUTONOMOUS INSTITUTE OF GOVT. OF MAHARASHTRA)

CURRICULUM 2016

DIPLOMA PROGRAMME
IN
INFORMATION TECHNOLOGY

INDEX

PREFACE

Government Polytechnic, Nashik is established in 1980. The institute has been conferred an academic autonomous status in 1995 by Government of Maharashtra because of excellent performance.

The vision of the institute is to be a premier technical training and development institute catering to the skill and professional development in multi-domain for successful employment / self-employment by offering certified and accredited NSQF compliant programmes. The institute shall be the center for excellence in skill development and community development through different training programmes, business incubation and entrepreneurship development. For this the institute is committed to provide education for skill development, engineering diploma and continuing education programmes for enhancement of employability skills of the aspirants in the job/self-employment through continually developing quality learning systems. The institute aims at holistic and student centric education in collaboration with business, industry and having practice based education. To achieve this continuous efforts are made to design the curriculum considering the latest development in the industrial sector and technology.

The three year Diploma Programme in Information Technology is being offered since 2001 under academic autonomy, first curriculum was implemented in 2001 and subsequently it was revised and implemented in 2007 and 2011. The curriculum revision is a regular activity and outcome based education approach is adopted for designing the curriculum. The revised outcome based curriculum is designated as "Curriculum 2016". The implementation of Curriculum 2016 will be effective from the academic year 2016- 17.

For designing the curriculum, the various domains have been identified. For Information Technology Programme these domains are Software Development (Programming), Operating System and PC Architecture and Maintenance, Software Testing and Engineering, Database Management System and Data Mining, Information Security, Data Communication Network and Communication Technology and Multimedia and Animation. The questionnaire has been designed to get the responses from these domain areas from different stake holders i.e. industries, teachers and students. The feedback from different stake holders has been analysed and roles, functions, activities, tasks and attitudes necessary for Diploma Engineer in Information Technology have been identified. The programme structure is finalised and the content detailing of individual course has been carried out by group of experts, and approved by Programme Wise Committee (PWC), Board of Studies (BOS) and Governing Body (GB).

In this Curriculum-2016, the student has to acquire 200 credits for successful completion of Diploma Programme. The courses of curriculum are structured at different 5 levels i.e. Foundation Courses, Basic Technology Courses, Allied Courses, Applied Technology Courses and Diversified Courses.

The minimum entry level is 10th. However, the curriculum provides "Multi Point Entry and

Credit system (MPEC)" for the students opting admission after passing 12th, ITI, MCVC. At higher entry level, the students will get exemptions in certain courses as per the rules.

There is a flexibility for opting the courses as per the choice of students. The curriculum provides "Sample Path" as a guide line for selection of courses in each term for entry level as 10th. The List of Courses for Award of Class after completion of Diploma Programme is prescribed separately in this curriculum.

The fulfilment of programme outcome as stated in the Curriculum-2016 will depend on its effective implementation. The teachers who are implementing the curriculum were also involved in the design process of curriculum, hence, I hope that the Curriculum-2016 will be implemented in effective way and the passouts will acquire the requisite knowledge and skills to satisfy the industrial needs.

(Prof. DNYANDEO PUNDALIKRAO NATHE)
Principal
Government Polytechnic, Nashik

GOVERNMENT POLYTECHNIC NASHIK

VISION

To be a premier technical training and development institute catering to the skill and professional development in multi-domain for successful employment/self-employment by offering certified and accredited NSQF compliant programmes. The institute shall be the center for excellence in skill development and community development through different training programmes, business incubation and entrepreneurship development.

MISSION

The Government Polytechnic Nashik, an autonomous institute of Government of Maharashtra has the mission to provide education for skill development, engineering diploma and continuing education programmes for enhancement of employability skills of the aspirants in the job/self-employment through continually developing quality learning systems. The institute aims at holistic and student centric education in collaboration with business, industry and having practice based education.

INFORMATION TECHNOLOGY DEPARTMENT

VISION

To emerge as a center of excellence in the domain of information technology and be the player in Digital India, having capability of producing technically proficient manpower which is competent of making significant contributions as entrepreneurs or professionals to the industry and society.

MISSION

Department of Information Technology is committed

M1. To impart quality engineering education and enhance problem solving skills.
M2. To develop innovative skills
M3. To encourage student for employable, entrepreneurial, and life- long learning skill.
M4. To mold student for integrity and ethics.
M5. To provide leadership with social sensitivity for the betterment of the society, humanity and country as a whole.

JOB PROFILE FOR INFORMATION TECHNOLOGY PASSOUTS

A Diploma Engineer in Information Technology has to carry out various activities in various areas during his implementation of engineering knowledge.

Information Technology job opportunities are available in following domains:

 a. Software Development (Programming),
 b. Operating System and PC Architecture and Maintenance,
 c. Software Testing and Engineering,
 d. Database Management System and Data Mining,
 e. Information Security,
 f. Data Communication Network and Communication Technology
 g. Multimedia and Animation

In above domain areas Diploma Engineer in Information Technology has to perform following duties.

 a. As a programmer in government, commercial and Industrial sectors.
 b. As a Computer aided designer.
 c. Software developer.
 d. Systems analyst.
 e. Technical Assistant
 f. Database Administrator.
 g. As a Computer graphics designer.
 h. Application developer
 i. Web application developer in e-business
 j. Network administration specialist in networking and security
 k. Marketing, sales, pre-sales or post-sales support staff
 l. Customer support
 m. Computer tutor
 n. Entrepreneur

DIPLOMA PROGRAMME IN NFORMATION TECHNOLOGY

RATIONALE

Information Technology has great influence on all aspects of life and it is rapidly changing discipline that affects many aspects of modern industry, almost all work places and living environment. These are being computerized. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of Information Technology such as understanding the concept of Information Technology and its scope; operating a computer; use of various tools of application softwares; using internet etc. This exposure will enable the students to enter their professions with confidence, live in a harmonious way, and contribute to the productivity.

PROGRAMME EDUCATION OBJECTIVES (PEOs)

I. To educate learners for successful job career and self-employment.
II. Students will be able to lead a multi-disciplinary team with good communication skills, leadership virtues and professional ethics.
III. Students will have the capability to identify social issues or crisis or problems or calamities and will be able to find solutions by applying concepts of information technology.
IV. Students will able to apply mathematics and scientific concepts for formulating analyzing and solving real world problems of engineering.

PROGRAMME OUTCOMES (POs)

On Successful Completion of Diploma Programme in Information Technology, the passouts will be able to,

a. **Basic knowledge:** An ability to apply knowledge of mathematics, science and engineering fundamentals to solve real world problems using IT technology.

b. **Discipline knowledge:** An ability to indentify, formulate, and solve real world problems by applying fundamentals of IT technologies.

c. **Experiments & Practice:** Ability to undertake, analyze, interpret and solve a specific real world problem by applying various domains like database, Networking, programming methodologies and Operating System principles.

d. **Engineering Tools:** An ability to identify and use various programming Frameworks, IDE's, Plugin's, Networking tools, Web platform tools for development and maintenance of software's and network.

e. **The Engineer & Society:** Ability to understand society troubles and resolve them by applying IT technologies.

f. **Environment & Sustainability:** Understand the impact of professional engineering solutions in societal and environmental context, and demonstrate the knowledge of, and need for sustainable development.

g. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of IT engineering practices in managing information technology resources and in providing IT solutions and services.

h. **Individual & Team Work:** Function effectively, individually and in multidisciplinary team to accomplish common goals with leadership qualities.

i. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

j. **Project Management & Finance:** Demonstrate knowledge and understanding engineering and management principles to manage projects in multidisciplinary environment.

k. **Lifelong Learning:** Recognize the need and be adaptable for independent and life-long learning in the context of technological changes.

PROGRAM SPECIFIC OUTCOME (PSO's)

On successful completion of Diploma Programme in Information Technology, the student will be able to,

PSO 1. Apply the basic concepts in various domains of Information Technology Programme such as Software Development (Programming), Operating System and PC Architecture and Maintenance, Software Testing and Engineering, Database Management System and Data Mining, Information Security, Data Communication Network and Communication Technology and Multimedia and Animation.

PSO 2. Apply and upgrade the knowledge and skills for the development, operation and maintenance of software.

PSO 3. Work effectively on various technical projects to satisfy the stakeholder needs.

PSO 4. Provide effective and efficient real time solution using engineering practices with professional ethics for social and environmental welfare

MAPPING OF MISSION AND PROGRAMME EDUCATIONAL OBJECTIVES

Sr. No.	Mission	Component of Mission Statement	PEO/s
1	M1	To impart quality engineering education and enhance problem solving skills.	III, IV
2	M2	To develop innovative skills	I, IV
3	M3	To encourage student for employable, entrepreneurial, and life-long learning skill.	I,II,
4	M4	To mold student for integrity and ethics.	II
5	M5	To provide leadership with social sensitivity for the betterment of the society, humanity and country as a whole.	II, III, IV

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES AND PROGRAMME OUTCOMES

Sr. No.	Programme Educational Objectives (PEOs)	Programme Outcomes (POs)
1	I. To educate learners for successful job career and self-employment;	a, b, j, i
2	II. Students will be able to lead a multi-disciplinary team with good communication skills, leadership virtues and professional ethics.	e, f, g, h, j
3	III. Students will have the capability to identify social issues or crisis or problems or calamities and will be able to find solutions by applying concepts of information technology.	c, d, e, i, k, h,
4	IV. Students will able to apply mathematics and scientific concepts for formulating analyzing and solving real world problems of engineering.	a, b, c, d, i

MAPPING OF PROGRAMME SPECIFIC OUTCOMES AND PROGRAMME OUTCOMES

Sr. No.	Programme Specific Outcomes (PSOs)	Programme Outcomes (POs)
1	I. Apply the basic concepts in various domains of Information Technology Programme such as Software Development (Programming), Operating System and PC Architecture and Maintenance, Software Testing and Engineering, Database Management System and Data Mining, Information Security, Data Communication Network and Communication Technology and Multimedia and Animation.	a, b, c, d, g.
2	II. Apply and upgrade the knowledge and skills for the development, operation and maintenance of software.	b, c, e, f, g, h, k.
3	III. Work effectively on various technical projects to satisfy the stakeholder needs.	c, d, e, f, g, h, i, j.
4	IV. Provide effective and efficient real time solution using engineering practices with professional ethics for social and environmental welfare	d, e, f, g, h, i, j.

MAPPING OF PROGRAMME OUTCOME AND COURSES

PO's No.	Programme Outcome (POs)	Course Name
a	**Basic knowledge:** An ability to apply knowledge of mathematics, science and engineering fundamentals to solve real world problems using IT technology.	Basic Mathematics Engineering Mathematics Applied Physics Applied Chemistry Engineering Graphics Applied Mathematics
b	**Discipline knowledge:** An ability to indentify, formulate, and solve real world problems by applying fundamentals of IT technologies.	Computer Fundamentals and Organization Elements of Electronics Fundamentals of Electrical Technology Programming in C Database Management Systems Microprocessor Data Structure Using 'C' PC Architecture and Maintenance
c	**Experiments & Practice:** Ability to undertake, analyze, interpret and solve a specific real world problem by applying various domains like database, Networking, programming methodologies and Operating System principles.	Java Programming Advanced Java ASP.NET Advance Database Management Systems PHP Programming Object Oriented Programming Data Mining and Big Data Linux Operating System Mobile Computing and Application Development
d	**Engineering Tools:** An ability to identify and use various programming Frameworks, IDE's, Plugin's, Networking tools, Web platform tools for development and maintenance of software's and network.	Software Engineering Object Oriented Modeling and Design Network Administration and Management Data Communication and Networking Software Testing Web Page Designing Scripting Technology VB.NET
e	**The Engineer & Society:** Ability to understand society troubles and resolve them by applying IT technologies.	Software Engineering Object Oriented Modeling and Design Software Testing Multimedia Technology Information Security Project Seminar Operating System Communication Technology

PO's No.	Programme Outcome (POs)	Course Name
		Digital Technique
f	**Environment & Sustainability:** Understand the impact of professional engineering solutions in societal and environmental context, and demonstrate the knowledge of, and need for sustainable development.	Environmental Studies Software Testing
g	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of IT engineering practices in managing information technology resources and in providing IT solutions and services.	Professional Practices Industrial Organization and Management
h	**Individual & Team Work:** Function effectively, individually and in multidisciplinary team to accomplish common goals with leadership qualities.	Professional Practices Entrepreneurship Development Project Seminar
i	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.	Communication Skills Development of Life Skills Computer Fundamentals and Organization Seminar
j	**Project Management & Finance:** Demonstrate knowledge and understanding engineering and management principles to manage projects in multidisciplinary environment.	Project E-Commerce Industrial Organization and Management Marketing Management
k	**Lifelong Learning:** Recognize the need and be adaptable for independent and life-long learning in the context of technological changes.	Professional Practices Seminar and Project Synopsis Entrepreneurship Development Project

PROGRAMME - DIPLOMA IN INFORMATION TECHNOLOGY
PROGRAMME STRUCTURE

SCHEME AT A GLANCE

Level	Name of Level	Total Number of Courses offered	Number of Courses to be completed	TH	TU	PR	Total Credits	Marks
Level-1	Foundation courses	11	11 Compulsory	30	02	24	56	1150
Level-2	Basic Technology Courses	09	09 Compulsory	26	--	28	54	1300
Level-3	Allied courses	07	05 (03 Compulsory +02 Electives)	10	--	04	14	400
Level-4	Applied Technology Courses	09	09 Compulsory	17	--	22	39	850
Level-5	Diversified Courses	12	06 Electives	17	--	20	37	800
TOTAL		**48**	**32 Compulsory +08 Electives -- 40**	**100**	**02**	**98**	**200**	**4500**

Abbreviations:

TH: Theory, TU: Tutorial, PR: Practical.

PROGRAMME - DIPLOMA IN INFORMATION TECHNOLOGY
PROGRAMME STRUCTURE
LEVEL – 1
FOUNDATION COURSES

Sr No	Course Code	Course Title	Course Abbr	TEACHING SCHEME				EXAMINATION SCHEME						
				TH	TU	PR	Total Credits	Theory Paper		Test	PR	OR	TW	Total
								Hrs	Mark					
01	6101	Communication Skills	CMS	03	--	02	05	03	80	20	--	--	50	150
02	6102	Development of Life Skills	DLS	01	--	02	03	--	--	--	--	--	50	50
03	6103	Basic Mathematics	BMT	03	01	--	04	03	80	20	--	--	--	100
04	6104	Engineering Mathematics	EMT	03	01	--	04	03	80	20	--	--	--	100
05	6105	Applied Physics	PHY	04	--	02	06	02#	80#	20#	--	--	50	150
06	6106	Applied Chemistry	CHY	04	--	02	06	02#	80#	20#	--	--	50	150
07	6107	Engineering Graphics	EGR	02	--	04	06	--	--	--	25	--	25	50
08	6113	Fundamentals of Electrical Technology	FET	04	--	02	06	03	80	20	--	--	50	150
09	6117	Computer Fundamentals and Organization	CFO	02	--	04	06	--	--	--	--	--	50	50
10	6118	Elements of Electronics	EOE	04	--	02	06	03	80	20	--	--	50	150
11	6119	Computer Workshop Practice	CWP	--	--	04	04	--	--	--	--	--	50	50
TOTAL			--	30	02	24	56	--	560	140	25	--	425	1150

Level: 1

    Total Courses   : 11
    Total Credits   : 56
    Total Marks   : 1150

Abbreviations:

    Abbr : Course Abbreviation, TH: Theory, TU: Tutorial, PR: Practical, OR: Oral, TW: Term Work.

Course code Indication :

    Example   : 6101
    First digit   : 6 : Indicates last digit of Year of Implementation of Curriculum
    Second digit   : 1 : Indicates Level.
    Third & Fourth digit   : 01 : Indicates Course Number.

Assessment of PR / OR / TW :
    1)   All orals & practicals are to be assessed by external & internal examiners.
    2)   * Indicates TW to be assessed by external & internal examiners.
    3)   Other TW are to be assessed by internal examiners.
    4)   # indicates Online theory Examination

PROGRAMME - DIPLOMA IN INFORMATION TECHNOLOGY
PROGRAMME STRUCTURE
LEVEL – 2
BASIC TECHNOLOGY COURSES

Sr No	Course Code	Course Title	Course Abbr	TEACHING SCHEME				EXAMINATION SCHEME						
				TH	TU	PR	Total Credits	Theory Paper		Test	PR	OR	TW	Total
								Hrs	Mark					
01	6234	Microprocessor	MPO	04	--	02	06	03	80	20	--	--	25	125
02	6235	Data Structures using 'C'	DST	03	--	04	07	03	80	20	50	--	25	175
03	6236	Database Management Systems	DBM	03	--	04	07	03	80	20	25	--	25	150
04	6237	Programming in C	PIC	03	--	04	07	03	80	20	25	--	25	150
05	6238	Object Oriented Programming	OOP	03	--	04	07	03	80	20	50	--	25	175
06	6239	PC Architecture and Maintenance	PCM	03	--	02	05	03	80	20	--	25	25	150
07	6240	Data Communication and Networking	DCN	03	--	02	05	03	80	20	--	25	25	150
08	6241	Web Page Designing	WPD	01	--	04	05	--	--	--	50	--	50	100
09	6242	Operating System	OPS	03	--	02	05	03	80	20	--	--	25	125
TOTAL			--	26	--	28	54	--	640	160	200	50	250	1300

Level: 2

Total Courses   : 09
Total Credits   : 54
Total Marks   : 1300

Assessment of PR / OR / TW:
1) All orals & practical's are to be assessed by external & internal examiners.
2) * Indicates TW to be assessed by external & internal examiners.
3) Other TW are to be assessed by internal examiners.

PROGRAMME - DIPLOMA IN INFORMATION TECHNOLOGY
PROGRAMME STRUCTURE
LEVEL – 3
ALLIED COURSES

Sr No	Course Code	Course Title	Course Abbr	TEACHING SCHEME				EXAMINATION SCHEME						
				TH	TU	PR	Total Credits	Theory Paper		Test	PR	OR	TW	Total
								Hrs	Mark					
01	6301	Applied Mathematics	AMT	03	--	--	03	03	80	20	--	--	--	100
02	6302	Environmental Studies	EVS	--	--	02	02	--	--	--	--	--	50	50
03	6303	Industrial Organization and Management	IOM	03	--	--	03	03	80	20	--	--	--	100
Elective I : Any **ONE** of the following														
04	6305	Supervisory Skills	SSL	03	--	--	03	03	80	20	--	--	--	100
	6306	Marketing Management	MKM	03	--	--	03	03	80	20	--	--	--	100
Elective II : Any **ONE** of the following														
05	6309	Entrepreneurship Development	EDP	01	--	02	03	--	--	--	--	--	50	50
	6315	E-Commerce	ECM	01	--	02	03	--	--	--	--	--	50	50
TOTAL			--	**10**	--	**04**	**14**	**--**	**240**	**60**	--	--	**100**	**400**

Level: 3

    Total Courses   : 05
    Total Credits   : 14
    Total Marks   : 400

Assessment of PR / OR / TW:
1) All orals & practical's are to be assessed by external & internal examiners.
2) * Indicates TW to be assessed by external & internal examiners.
3) Other TW are to be assessed by internal examiners.

PROGRAMME - DIPLOMA IN INFORMATION TECHNOLOGY
PROGRAMME STRUCTURE
LEVEL – 4
APPLIED TECHNOLOGY COURSES

Sr No	Course Code	Course Title	Course Abbr	TEACHING SCHEME				EXAMINATION SCHEME						
				TH	TU	PR	Total Credits	Theory Paper		Test	PR	OR	TW	Total
								Hrs	Mark					
01	6410	Professional Practices	PPR	--	--	04	04	--	--	--	--	--	50	50
02	6411	Seminar	SEM	--	--	02	02	--	--	--	--	--	50	50
03	6412	Project	PRO	--	--	04	04	--	--	--	--	50	50*	100
04	6434	Software Engineering	SWE	03	--	--	03	03	80	20	--	--	--	100
05	6435	Communication Technology	CMT	03	--	--	03	03	80	20	--	--	--	100
06	6436	Digital Techniques	DTE	03	--	02	05	03	80	20	--	--	25	125
07	6437	Java Programming	JPR	03	--	04	07	03	80	20	25	--	25	150
08	6438	Software Testing	STG	03	--	02	05	03	80	20	--	--	25	125
09	6439	Scripting Technology	SPT	02	--	04	06	--	--	--	25	--	25	50
TOTAL				--	17	--	22	39	--	400	100	50	50	250	850

Level: 4

Total Courses   : 09
Total Credits   : 39
Total Marks   : 850

Assessment of PR / OR / TW :
1) All orals & practical's are to be assessed by external & internal examiners.
2) Other TW are to be assessed by internal examiners.
3) * Indicates TW to be assessed by external & internal examiners.

PROGRAMME - DIPLOMA IN INFORMATION TECHNOLOGY
PROGRAMME STRUCTURE
LEVEL – 5
DIVERSIFIED COURSES

Sr No	Course Code	Course Title	Course Abbr	TEACHING SCHEME				EXAMINATION SCHEME						
				TH	TU	PR	Total Credits	Theory Paper		Test	PR	OR	TW	Total
								Hrs	Mark					
Elective III : Any **ONE** of the following														
01	6537	Object Oriented Modeling and Design	OOM	03	--	02	05	3	80	20	--	25	25	150
	6538	Information Security	IFS	03	--	02	05	3	80	20	--	25	25	150
	6539	Advance Database Management	ADM	03	--	02	05	3	80	20	--	25	25	150
Elective IV : Any **FOUR** of the following														
02	6540	ASP.NET Technology	ASP	03	--	04	07	3	80	20	--	25	25	150
	6541	PHP Programming	PHP	03	--	04	07	3	80	20	--	25	25	150
03	6542	Mobile Computing and Application Development	MCD	03	--	04	07	3	80	20	--	25	25	150
04	6543	Data Mining and Big Data	DMB	03	--	04	07	3	80	20	--	25	25	150
05	6544	Advanced Java	ADJ	03	--	04	07	3	80	20	--	25	25	150
	6545	Linux Operating System	LOS	03	--	04	07	3	80	20	--	25	25	150
Elective V : Any **ONE** of the following														
06	6546	Network Administration and Management	NAM	02	--	02	04	--	--	--	--	25	25	50
	6547	Multimedia Technology	MLT	02	--	02	04	--	--	--	--	25	25	50
	6548	VB. NET Technology	VBN	02	--	02	04	--	--	--	--	25	25	50
TOTAL			**--**	**17**	**--**	**20**	**37**	**--**	**400**	**100**	**--**	**150**	**150**	**800**

Level: 5

Total Courses : 06
Total Credits : 37
Total Marks : 800

Assessment of PR / OR / TW:
1) All orals & practical's are to be assessed by external & internal examiners.
2) * Indicates TW to be assessed by external & internal examiners.
3) Other TW are to be assessed by internal examiners.

PROGRAMME - DIPLOMA IN INFORMATION TECHNOLOGY
Courses for Award of Class

Sr No	Course Code	Course Title	Course Abbr	TH	TU	PR	Total Credits	Theory Paper Hrs	Theory Paper Mark	Test	PR	OR	TW	Total
01	6235	Data Structures using 'C'	DST	03	--	04	07	07	80	20	50	--	25	175
02	6236	Database Management Systems	DBM	03	--	04	07	03	80	20	25	--	25	150
03	6240	Data Communication and Networking	DCN	03	--	02	05	03	80	20	--	25	25	150
04	6303	Industrial Organization and Management	IOM	03	--	--	03	03	80	20	--	--	--	100
05	6411	Seminar	SEM	--	--	02	02	--	--	--	--	--	50	50
06	6412	Project	PRO	--	--	04	04	--	--	--	--	50	50*	100
07	6437	Java Programming	JPR	03	--	04	07	03	80	20	25	--	25	150
08	6438	Software Testing	STG	03	--	02	05	03	80	20	--	--	25	125
Any **FOUR** from **Elective IV**														
09	6540	ASP.NET Technology	ASP	03	--	04	07	03	80	20		25	25	150
	6541	PHP Programming	PHP	03	--	04	07	03	80	20		25	25	150
10	6542	Mobile Computing and Application Development	MCD	03	--	04	07	03	80	20		25	25	150
11	6543	Data Mining and Big Data	DMB	03	--	04	07	3	80	20		25	25	150
12	6544	Advanced Java	ADJ	03	--	04	07	3	80	20		25	25	150
	6545	Linux Operating System	LOS	03	--	04	07	3	80	20		25	25	150
TOTAL				--	30	--	38	68	--	800	200	100	175	325	1600

Total Courses   :   12
Total Credits   :   68
Total Marks   :   1600

Assessment of PR / OR / TW :
1) All orals & practicals are to be assessed by external & internal examiners.
2) * Indicates TW to be assessed by external & internal examiners.
3) Other TW are to be assessed by internal examiners.

PROGRAMME - DIPLOMA IN INFORMATION TECHNOLOGY
SAMPLE PATH
ENTRY LEVEL 10+

Nature of Course	First Year		Second Year		Third Year		Total
	Odd Term	Even Term	Odd Term	Even Term	Odd Term	Even Term	
Compulsory	6102 (03) DLS	6101 (05) CMS	6235 (07) DST	6234 (06) MPO	6242 (05) OPS	6412 (04) PRO	
	6103 (04) BMT	6104 (04) EMT	6236 (07) DBM	6238 (07) OOP	6411 (02) SEM		
	6105 (06) PHY	6106 (06) CHY	6241 (05) WPD	6301 (03) AMT	6435 (03) CMT		
	6107 (06) EGR	6113 (06) FET	6239 (05) PCM	6240 (05) DCN	6437 (07) JPR		
	6117 (06) CFO	6118 (06) EOE	6410 (04) PPR	6303 (03) IOM	6438 (05) STG		
	6119 (04) CWP	6237 (07) PIC	6436 (05) DTE	6434 (03) SWE			
	6302 (02) EVS			6439 (06) SPT			
Total credits	31	34	33	33	22	04	157
Elective	--	--	Any **one** from Elective: I: 1. 6305 SSL (3) 2. 6306 MKM (3) **:(03)**	--	Any **one** from Elective: III: 1. 6537 OOM (5) 2. 6538 IFS (5) 3. 6539 ADM (5) **:(05)** Any **one** from Elective: V: 1. 6546 NAM (4) 2. 6547 MLT (4) 3. 6548 VBN (4) **:(04)**	Any **one** from Elective: II: 1. 6309 EDP (3) 2. 6315 ECM (3) **:(03)** Any **Four** from Elective : IV : 1. 6540 ASP (7) 2. 6541 PHP (7) 3. 6542 MCD (7) 4. 6543 DMB (7) 5. 6544 ADJ (7) 6. 6545 LOS (7) **:(28)**	
Total Credits (Elect.)	--	--	03	--	09	31	43
Total Courses	07	06	07	07	07	06	40
Total Credits (Comp+Elect.)	31	34	36	33	31	35	200
Grand Total of Credits							200

Note: Figures in bracket indicates total credits.

PROGRAMME : Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE / DD / ID
COURSE : Communication Skills (CMS)   **COURSE CODE :** 6101

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	02	05	03	Max.	80	20	100	--	--	50	150
					Min.	32	--	40	--	--	20	--

1.0 RATIONALE:

Proficiency in English is one of the basic needs of technical students hence this curriculum aims at developing the functional and communicative abilities of the students. As Communication skills play a decisive role in the career development and entrepreneurship this course will guide and direct to develop a good personality and effective communication too. This course is compiled with an aim of shaping minds of engineering students while catering to their needs.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Understand & use basic concepts of Communication in an organisation and social context.
2. Use reasonably and grammatically correct English language with reading competency.
3. Utilise the skills to be a competent communicator.
4. Develop comprehension skills, improve vocabulary and acquire writing skills.
5. Overcome language and communication barriers with the help of effective communication techniques.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Apply the process and identify types of Communication for being an effective communicator
2. Identify the barriers in the communication process and apply ways to overcome them
3. Interpret graphical information precisely
4. Use formal written skills for business correspondence.
5. Exhibit listening & reading skills for improving competencies in communication.
6. Pronounce English sounds with correct stress and intonation in day to day conversations.
7. Construct correct grammatical sentences in oral and written communication.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Communication**	1a. Define communication & objectives 1b. Describe the process of Communication 1c. Differentiate between types of communication	1.1 Meaning of communication: definition, objectives and Importance of communication 1.2 Elements/Process of communication 1.3 Types of communication: Formal, Informal, Verbal, Nonverbal, vertical, Horizontal, Diagonal	04

Unit-II
 	
Communicatio
	2a. Explain types of barriers
	2b. Describe the
		2.1 Barriers to Communication
		  a) Physical Barrier
		    • Environmental(time, noise,
			04

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
n Barriers	principles of effective communication 2c. Discuss ways to overcome barriers. 2d. Identify various barriers	distance and surroundings) • Personal(deafness, stammering, ill-health, spastic, bad handwriting, temporary physical disabilities) b) Mechanical: Machines/means oriented c) Psychological: Day dreaming prejudice, emotional, blocked mind, generation gap, status, inactiveness, perception d) Language: Difference in language, technical jargons pronunciation and allusion 2.2 Ways to overcome barriers 2.3 Principles of effective communication	
Unit-III **Nonverbal & Graphical communication**	3a. Explain use of body language in oral conversations 3b. Label and interpret the graphical information correctly 3c. Describe the importance of graphical and nonverbal methods in technical field.	3.1 Non-verbal codes: • Proxemics • Chronemics • Artefacts 3.2 Aspects of body language(Kinesics) 3.3 Graphical communication • Advantages and disadvantages of graphical communication • Tabulation of data and its depiction in the form of bar graphs and pie charts.	06
Unit-IV **Formal Written Communication**	4a. Develop notices, circulars and emails 4b. Draft letters on given topics 4c. Prepare technical reports. 4d. Develop various types of paragraphs.	4.1 Office Drafting: Notice, Memo, Circulars and e-mails 4.2 Job application and resume 4.3 Business correspondence: Enquiry, Reply to an enquiry order, complaint, adjustment, 4.4 Technical Report Writing: Accident report, Fall in Production / survey, progress Investigation / maintenance 4.5 Paragraph writing -Types of paragraphs • Descriptive • Technical • Expository	12
Unit-V **Listening skills**	5a. Differentiate between hearing and listening. 5b. Apply techniques of effective listening.	5.1 Listening versus hearing 5.2 Merits of good listening 5.3 Types of listening 5.4 Techniques of effective listening	02
Unit-VI **Reading Skills**	6a. Describe various methods to develop vocabulary 6b. Develop reading competencies. 6c. Explain steps to comprehend	6.1 Reading for comprehension 6.2 Reading styles 6.3 Developing vocabulary 6.4 Methods of word formation: prefixes, suffixes, collocations, synonyms, antonyms, Homophones, Homonyms. 6.5 Comprehension of unseen passages	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	passage		
Unit-VII **Speaking Skills**	7a. Demonstrate Correct Pronunciation, stress and intonation in everyday conversation 7b. Develop formal conversational techniques. 7c. Deliver different types of speech	7.1 Correct Pronunciation -Introduction to sounds vowels, consonants, stress, intonation 7.2 Conversations: • Meeting & Parting • Introducing & influencing requests • Agreeing & disagreeing • Formal enquiries 7.3 Speech-Types of speech • Welcome Speech • Farewell speech • Vote of thanks	06
Unit-VIII **Language Grammar**	8a. Use grammatically correct sentence in day to day oral and written communication 8b. Distinguish between determiners & apply correctly in communicative use 8c. Use correct verb for given course. 8d. Use appropriate preposition as per time, place and direction. 8e. Transform the sentences.	8.1 Tense • Present Tense(Simple, Continuous, perfect, perfect Continuous) • Past Tense(Simple, Continuous, perfect, perfect Continuous) • Future Tense(Simple) 8.2 Determiners • Articles (A, An, The) • Some, Any, Much, Many, All, Both, Few, A few, The few, Little, A little, The little, Each, Every. 8.3 Modal Auxiliaries • Can, Could, May, Might, Shall, Should, Will, Would, Must, Have to, Need, ought to 8.4 Sentence Transformation • Voice • Degree • Affirmative, Negative, Assertive, 8.5 Prepositions • Time • Place • Direction 8.6 Conjunctions	08
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Communication	--	02	04	06
II	Communication Barriers	02	02	02	06
III	Nonverbal & Graphical communication	--	02	08	10
IV	Formal Written Communication	--	04	18	22
V	Listening Skills	--	--	04	04
VI	Reading Skills	--	02	06	08
VII	Speaking Skills	02	02	04	08
VIII	Language Grammar	**--**	04	12	16
	TOTAL	**04**	**18**	**58**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** *as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hours
1	I	Communicate on the given topic/situation.	02
2	II	Identify communication barriers	02
3	III	Non-verbal communication	02
4	IV	Business letter writing &job application	02
5	IV	Draft official letter	02
6	IV	Technical report writing on given topic	04
7	V	Attend a seminar and preparing notes	02
8	VI	Vocabulary building with different methods	02
9	VII	Language lab Experiment for correct pronunciation of sounds	04
10	VII	Write & present conversations on given situations	02
11	VIII	Grammar application-various exercises on grammar	04
12	I to VIII	Mini project (on given topic)	04
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Prepare charts on types of communication.
2. Convert language information in graphical or nonverbal codes.
3. Maintaining own dictionary of difficult words, words often confuse, homophones & homonyms.
4. Listening daily English news on television or radio & to summarise it in their language.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Use audios of correct pronunciations.
2. Show videos about use of body language in oral formal conversations

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Effective English Communication	Krishna Mohan and Meenakshi Raman	Tata McGraw Hill Publishing Co. Ltd.
2	English for practical purpose	Z. N. Patil	Macmillan
3	Spoken English	Basal and Harrison	Orient Longman
4	Contemporary English Grammar	R. C. Jain, David Green	Macmillan
5	Business correspondence and Report writing	R. C. Sharma and Krishna Mohan	Tata McGraw Hill Publishing
6	English Communication for Polytechnics	S. Chandrashekhar & others	Orient Black Swan
7	Active English Dictionary	S. Chandrashekhar & others	Longman

B) Software/Learning Websites
1. http://www.communicationskills.co.in
2. http://www.mindtools.com
3. http://www.communication.skills4confidence
4. http://www.goodcommunication skills.net
5. http://www.free-english-study.com/
6. http://www.english-online.org.uk/
7. http://www.englishclub.com
8. http://www.learnenglish.de
9. http://www.talkenglish.com/
10. http://www.englishgrammarsecrets.com
11. http://www.myenglishpages.com/
12. http://www.effective-business-letters.com/
13. http://www.englishlistening.com/
14. http://www.class-central.com

C) Major Equipments/ Instruments with Broad Specifications
1. Digital English Language Laboratory.
2. Computers for language laboratory software
3. Headphones with microphone

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1									H		M
CO2									H		M
CO3	M								H		M
CO4		M							H		M
CO5	M								H		M
CO6		M							H		
CO7	M								H		M

H: High Relationship, M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in CE / ME / PS / EE / IF / CM / EL /AE / DD / ID
COURSE : Development of Life Skills (DLS)   **COURSE CODE :** 6102

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.		Marks						
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
01	--	02	03	--	Max.	--	--	--	--	--	50	50
					Min.	--	--	--	--	--	20	--

1.0 RATIONALE:

This course will develop the student as an effective member of the team in the organization. It will develop the abilities and skills to perform at highest degree of quality. It enhances his/her capabilities in the field of searching, assimilating information, handling people effectively and solving challenging problems.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Develop the abilities and skills to perform at highest degree of quality as an individual as well as a member of core group or team.
2. Enhance capabilities in the field of searching, assimilating information, managing the given task, handling people effectively and solving challenging problems.
3. Understand and use personal management techniques.
4. Analyse their strengths, weaknesses, opportunities and threats.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Analyse self attitude and behaviour.
2. Acquire self learning techniques by using various information sources
3. Identify personal strengths to get future opportunities.
4. Develop presentation skills with the help of effective use of body language.
5. Enhance leadership traits and recognise the importance of team work.
6. Face interview without fear
7. Resolve conflict and solve problems by appropriate methods.
8. Set the goal for personal development.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Self Analysis**	1a. Explain types of Motivation. 1b. Differentiate between types of attitude. 1c. Describe types of behaviour 1d. Analyse SWOT of an individual	1.1 Motivation-types, need 1.2 Attitude-types, tips for developing positive attitude 1.3 Behaviour-types-passive, assertive, aggressive 1.4 Confidence building-need, importance 1.5 SWOT analysis-(significance)	02
Unit-II **Self Learning**	2a. Explain the self learning techniques by enhancing	2.1 Need & importance of SLT 2.2 Information source-Primary, secondary, tertiary	02

14

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Techniques (SLT)	memory and concentration 2b. Apply practical skills for effective learning 2c. Identify the information sources	2.3 Enhancing Memory and concentration 2.4 Learning Practical Skills- need of Practical Skills types of practical skills-technical, organisational, human Domains of learning 1)cognitive 2)Affective 3)psychomotor 2.5 information search techniques-library search, internet search	
Unit-III Self Development & management	3a. Explain the Need of self Management 3b. Set the goals for personal development	3.1 Stress management-remedies to avoid, minimize stress 3.2 Health management –importance of Diet & exercise 3.3 Time management-time planning, tips for effective time management 3.4 Goal setting-need and importance 3.5 Creativity	03
Unit-IV Emotions	4a. Explain nature and types of human emotions 4b. Differentiate between cognitive and emotional intelligence	4.1 Basic emotions- 4.2 Emotional intelligence 4.3 Emotional stability/maturity	01
Unit-V Presentation skills	5a. Develop presentation skills with the help of body language 5b. Describe utilisation of voice quality in oral conversations	5.1 Body Language – Codes, dress and appearance, postures, gestures Facial expressions 5.2 Voice and language 5.3 Use of aids: OHP, LCD projector, white board	02
Unit-VI Group discussion and interview techniques	6a. Participate in group discussion 6b. Face interview without fear.	6.1 introduction to group discussion 6.2 ways to carry group discussion 6.3 Parameters-analytical, logical thinking, Decision making 6.4 Interview techniques Necessity, tips for handling common questions	02
Unit-VII Team work	7a. Recognise the importance of team work 7b. Enhance leadership qualities	7.1 stages of team development 7.2 Understand and work with dynamic group 7.3 Ingredients of effective teams. 7.4 leadership in teams, handling frustration in group	02
Unit-VIII Conflicts & Problem Solving	8a. Describe sources of conflicts and resolve conflicts 8b. Develop lateral thinking abilities 8c. Identify innovative methods in solving Problems.	8.1 sources of conflict 8.2 Resolution of conflict 8.3 ways to enhance interpersonal relation 8.4 Steps in problem solving 8.5 Problem solving techniques-trial, error & brainstorming	02
		TOTAL	16

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):
Not Applicable

6.0 ASSIGNMENTS/PRACTICALS/TASKS:
The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* **Programme Outcomes/Course Outcomes in affective domain** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I	Self Introduction-giving personal details for introducing self	02
2	II	SLT-Access the book on biography of scientist/industrialist/invention from the library or internet	02
3	I	Deliver a seminar for 10 minutes using presentation aids.	02
4	IV	Prepare PowerPoint slides on given topic and make presentation	02
5	VII	Case study for problem solving in an organisation	04
6	V	Discuss a topic in a group & prepare minutes of discussion.	02
7	VI	Prepare questionnaire for your friend or any person in the organisation to check emotional intelligence.	02
8	VII	Goal setting for achieving the success-SMART goal.	02
9.	I	SWOT Analysis for yourself with respect to your Strength, Weakness, Opportunities & Threats	04
10	III	Attend a seminar or a guest lecture and note down the important points and prepare a report of the same.	02
11	VIII	Undertake any social activity in a team and prepare a report about it(i.e. tree plantation, blood donation, environment protection, rain water harvesting)	04
12	III	Management of self-stress management, time management, health management	04
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:
Following is the list of proposed student activities like
1. Preparing personal time table.
2. Performing YOGA as a routine part of daily life.
3. Practicing breathing exercises.
4. Improving concentration by chanting and meditation.
5. Focusing on behavior skills and mannerism
6. Searching information on internet and newspapers.
7. Concentrating on various aspects of personality development.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Use of videos on personality development.
2. Use of power point presentation on health, time & stress management
3. Case study of an organization
4. Use of videos to show interviews of successful personalities.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Make Every Minute Count	Marion E Haynes	Kogan Page India
2	Body language	Allen Pease	Sudha Publication Pvt. Ltd.
3	Presentation Skills	Michael Hatton	ISTE New Delhi
4	Organizational Behavior	Pearson Education Asia	Tata McGraw Hill
5	Working in Teams	Chakravarty, Ajanta	Orient Longman
6	Develop Your Assertiveness	Bishop, Sue	Kogan Page India
7	Adams Time Management	Marshall Cooks	Viva Books
8	Time Management	Chakravarty, Ajanta	Rupa and Company
9	Target setting & Goal Achievement	Richard hale, Peter whilom	Kogan page India
10	Creativity &problem solving	Lowe and Phil	Kogan page (I)P Ltd
11	Basic Managerial Skills for all	E. H. Mc Grah, S. J.	Prentice Hall of India, Pvt. Ltd.

B) Software/Learning Websites

1. http://www.mindtools.com
2. http://www.successconsciousness.com
3. http://www.studyhabits.com
4. http://www.motivateus.com
5. http://www.quickmba.com
6. http://www.success77.com
7. http://www.stress.org
8. http://www.topachievement.com
9. http://www.ethics.com
10. http://www.creativityforlife.com
11. http://www.motivation.com
12. http://www.queendom.com

C) Major Equipments/ Instruments with Broad Specifications

Not Applicable

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	L	M			L		L	M	H		H
CO2	M	M			L	L	H		M		H
CO3					M		M	M	H		H
CO4	L	L			L	M	M		H		M
CO5					L		M	M	H	M	L
CO6		L			L	M			H		M
CO7	L				M	M	L	M	M	L	L
CO8	L	L			L	M	L	L	H		L

H: High Relationship, M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme CE / ME / PS / EE / IF / CM / EL / AE
COURSE : Basic Mathematics (BMT) **COURSE CODE** : 6103

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	01	--	04	03	Max.	80	20	100	--	--	--	100
					Min.	32	--	40	--	--	--	--

1.0 RATIONALE:

This course is classified under foundation course and intends to teach the students basic facts, concepts and principles of Mathematics, as a tool to analyse the engineering problems and lay down the understanding of basic technology courses.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Acquire the knowledge of mathematical terms definitions, principles and procedure of algebra, trigonometry and co-ordinate geometry.
2. Develop the process of logical thinking.
3. Comprehend the principles of the other courses.
4. Solve problems by using analytical & systematic approach.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Apply logarithm concept for solving mathematical problems
2. Solve determinant and matrix
3. Solve simultaneous equation in three variables
4. Use partial fraction to solve engineering problems
5. Apply binomial theorem to solve engineering problems
6. Determine properties of triangle and solution of triangle
7. Use coordinate geometry for solving problems in straight lines and circles

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Logarithm**	1a. Define logarithm use it for conversion 1b. Apply laws of logarithm to solving problems 1c. Identify common logarithm and Naperian logarithm	1.1 Concept and definition of Logarithm, conversion of exponential and logarithmic forms 1.2 Laws of logarithms and change of base formula 1.3 Common logarithm and **Naperian** logarithm definition and **notation only.**	03
Unit-II **Determinant & Matrix Algebra**	2a. Calculate determinant of order two and three and apply Cramer's Rule. 2b. Calculate area Of Triangle & condition of	2.1 Determinant of order two and three, Cramer's Rule for Three Variables. Area of Triangle and Condition of Co linearity. 2.2 Definition of a matrix, types of matrix, algebra of matrices, equality of	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	co linearity 2c. Define various types of matrices; solve problems using Algebra of matrix. 2d. Calculate Inverse of matrix	matrices, scalar multiplication, product of two matrices, Transpose of matrix. 2.3 Minor, cofactor and ad joint of matrix, Inverse of matrix by ad Joint matrix method.	
Unit-III **Partial Fraction**	3a. Identify proper & improper 3b. Resolve partial fraction method of Case I, Case II and Case III.	3.1 Rational function, proper and Improper rational Functions 3.2 Concept of partial fraction. Case-1 The denominator contains linear non repeated factors. Case-2 the denominator contains linear but repeated factors Case-3 the denominator contains quadratic irreducible factors	05
Unit-IV **Binomial Theorem**	4a. State Binomial Theorem for Positive integral Index. 4b. Use T_{R+1} for finding middle term general term 4c. Use approximation Theorem for solving problems	4.1 Binomial Theorem for positive integral index, formula for Tr+1, Middle term, particular term. 4.2 Binomial Theorem for rational and negative index (expansion up to four terms only), approximation theorem, simple problems	04
Unit-V **Measurement Of Angle**	5a. Conversion of sexagesimal systems & circular systems	5.1 Measurement of angles, sexagesimal systems & circular systems, co-terminal angles, positive and negative angles, conversion of angle to radian to degree and degree to radians.	02
Unit-VI **Trigonometric Ratios**	6a. Calculate trigonometric ratios of any angle, Solve problem using fundamental Identities. 6b. Solving problem using allied, Compound, Multiple and Sub multiple forms.	6.1 Trigonometric ratios of any angle, graph of trigonometric functions fundamental identities 6.2 Trigonometric ratios of allied, compound, multiple and sub multiple angles, sum &product forms.	08
Unit-VII **Inverse Trigonometric Functions**	7a. Convert & solving inverse trigonometry function 7b. Use of $\tan^{-1}x + \tan^{-1}y$ form to solve problem.	7.1 Concept and definition of trig. Function, Relation between inverse trig. functions	02
Unit-VIII **Properties Of Angle And Solution Of Triangle**	8a. Use properties of triangle: Sine rule, Cosine rule to solve mathematical problems 8b. Solve any triangle problems	8.1 Sine rule, cosine rule & law of tangent (simple problems) 8.2 solutions of triangle	04
Unit-IX	9a. Calculate Slope, X and	9.1 Slope and intercepts of straight line,	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Equation Of Straight Line	Y, intercept Use various form of Straight line to solve problems.	various form of straight line, angle between two lines, condition for two parallel or perpendicular lines, perpendicular distance formula, distance between two parallel lines.	
Unit-X **Equation Of Circle**	10a. Calculate Radius & Centre of general circle 10b. Apply various form of circle 10c. Calculate Equation of tangent & normal to the circle.	10.1 Equation Of std. circle, center radius form, general form of circle, Diameter form of circle, equation of tangent and normal to the circle.	04
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Logarithm	02	02	02	06
II	Determinant And Matrix Algebra	04	08	04	16
III	Partial Fraction	02	04	02	08
IV	Binomial Theorem	02	02	02	06
V	Measurement Of Angle	02	02	--	04
VI	Trigonometric Ratios	04	04	04	12
VII	Inverse Trigonometric Function	02	02	--	04
VIII	Properties of Triangle And Solution Of Triangle	02	02	04	08
IX	Equation Of Straight Line	02	04	04	10
X	Equation Of Circle	02	02	02	06
	TOTAL	**24**	**32**	**24**	**80**

6.0 ASSIGNMENTS/ TUTORIAL /TASKS

Sr. No.	Unit No.	Batch wise Tutorial Exercises **Tutorial:** Ten question of multiple choice with justification	Approx. Hrs. required
1	I	Logarithm	01
2	II	Determinant	01
3	II	Matrix Algebra	02
4	III	Partial Fraction	01
5	IV	Binomial Theorem	02
6	V	Measurement And Angle	01
7	VI	Trigonometric Ratios	01
8	VI	Trigonometric Ratios	01
9	VII	Inverse Trigonometric Ratios	02
10	VIII	Properties of Triangle And Solution Of Triangle	01
11	IX	Straight Line	02
12	X	Circle	01
		TOTAL	**16**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Teacher guided self learning activities.
2. Applications to solve identified Engineering problems and use of Internet.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

Not Applicable

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Mathematics for polytechnic student (I)	S. P. Deshpande	Pune Vidyarthi Gruha
2	Trigonometry	S. L. Loney	S. Chand
3	Higher Engineering Mathematics	B. S. Grewal	Khanna
4	College Algebra	F.G. Valles	Charter Publication.
5	Higher Algebra	H. S. Halls & S.R. Night	
6	Matrices	F. Ayers	Schan Series. Metric Edition Book, Palace of India.

B) Software/Learning Websites

1. http://www.mathsisfun.com
2. http://mathinsight.org/logarithm_basics
3. http://www.mathportal.org/linear-algebra/determinants/determinant-of-a-matrix.php
4. http://www.math.hmc.edu/calculus/tutorials/matrixalgebra/
5. http://ibgwww.colorado.edu/~carey/p7291dir/handouts/matrix.algebra.pdf
6. http://www.purplemath.com/modules/binomial2.htm
7. http://www.themathpage.com/atrig/line.htm
8. http://i1.dainikbhaskar.com/web2images/education/maths_13659_13897.pdf
9. http://mathworld.wolfram.com/InverseTrigonometricFunctions.html
10. http://aieee.examcrazy.com/maths/formula-tips/Co-ordinate-Geometry-circle.asp

C) Major Equipments/ Instruments with Broad Specifications

1. Scientific Calculator
2. Computer system with Printer and Internet system.
3. LCD Projector

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H		M								L
CO2	H		M								L
CO3	H		L								L
CO4	H		L								L
CO5	H		M								L
CO6	H		M								L
CO7	H		M								L

H: High Relationship,   M: Medium Relationship,   L: Low Relationship.

PROGRAMME : Diploma Programme CE / ME / PS / EE / IF / CM / EL / AE
COURSE : Engineering Mathematics (EMT) **COURSE CODE** : 6104

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	01	--	04	03	Max.	80	20	100	--	--	--	100
					Min.	32	--	40	--	--	--	--

1.0 RATIONALE:

The study of mathematics is necessary to develop in the students the skills essential new for the disciplines like Genetic Engineering, Biotechnology and Information Technology etc. This course is extension of Basic Mathematics and stepping to learn applied mathematics. Engineering mathematics lays down the foundation to understand and express principles and laws involved in other technology courses.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Acquire knowledge of differential calculus, vector algebra, statistics and probability, complex numbers.
2. Develop the ability to apply mathematical methods to solve engineering problem
3. Acquire sufficient mathematical techniques necessary for daily and practical problems.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes :
1. Solve function and limit of function
2. Apply derivatives to solve engineering problems
3. Apply vector to solve engineering problems
4. Determine statistics probability to solve engineering problems
5. Solve engineering problems using complex number

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Function**	1a. Solve problem of functions, State even & odd function, identify various types of function.	1.1 Definition of function, types of functions, Basic functions such as algebraic, exponential, logarithmic, trigonometric, inverse trigonometric functions, explicit, implicit, composite, inverse, parametric, exponential even & odd functions, simple problems	03
Unit-II **Limits**	2a. Apply limit of various types of Functions.	2.1 Definition of limit, limit of Functions such as algebraic Functions, trigonometric functions, logarithm and exponential functions	05
Unit-III **Derivatives**	3a. Solve problems of derivative with the help of rules & formulae of derivative. 3b. Differentiate various	3.1 Concept and definition of derivative, Notation, standard Formulae and rules of derivative 3.2 Methods of differentiation, derivative of composite functions, implicit function.	10

22

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	types of functions 3c. Calculate second order of derivative.	Parametric function. Inverse function. Logarithmic Differentiation. 3.3 Second order derivatives, simple problems.	
Unit-IV **Application Of Derivatives**	4a. Apply geometrical meaning of derivative; solve the problem based on related rates, radius of curvature & maxima minima.	4.1 Geometric meaning of derivative 4.2 Error theorem. 4.3 Related rates, radius of curvature 4.4 Maxima & Minima	06
Unit-V **Vectors**	5a. Apply algebra of vector 5b. Calculate scalar and vector products 5c. Apply vector algebra to find work done and moment of force, Area of parallelogram	5.1 Definition of vector, position vector, algebra of vector (equality, addition, subtraction and scalar multiplication) 5.2 Dot (scalar) and vector (cross) product of two vectors. 5.3 Application of vectors, work done and moment of force about a point and line.	08
Unit-VI **Statistics & Probability**	6a. Calculate range, mean deviation, standard deviation for group and ungrouped data, coefficient of variance 6b. Apply the theory of probability to solve problem 6c. Apply addition and multiplication theorems	6.1 Measure of dispersion such as range, mean deviation, standard deviation, variation and coefficient of variation. 6.2 Definition of random experiment, sample space event, occurrence of events and types of events (impossible, mutually exclusive, exhaustive and equally likely) 6.3 Definition of probability, addition and multiplication theorems of probability.	08
Unit-VII **Complex Number**	7a. Solve problem based on complex number(real and imaginary part, polar form) 7b. Apply Algebra of complex number to solve problem 7c. Solve problem of Euler's function & circular function, Hyperbolic function.	7.1 Definition of complex number, Cartesian, polar and exponential forms of complex number. 7.2 Algebra of complex no. (equality, addition, subtraction multiplication and division) 7.3 De–Moiver's theorem (without proof) and simple problems. 7.4 Euler's form of circular functions, Hyperbolic functions and relation between them.	08
TOTAL			**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Function	02	02	--	04
II	Limits	02	04	02	08
III	Derivative	06	08	06	20
IV	Application Of Derivative	02	04	06	12
V	Vector	04	06	02	12
VI	Statistics And Probability	04	04	04	12

Unit No.	Unit Title	Distribution of Marks			
		R Level	U Level	A and above Levels	Total Marks
VII	Complex Number	04	04	04	12
	TOTAL	**24**	**32**	**24**	**80**

6.0 ASSIGNMENTS/TUTORIAL/TASKS:

Sr. No.	Unit No.	**Batch wise Tutorial Exercises** (Outcomes in Psychomotor Domain) **Tutorial:** Ten question of multiple choice with justification	Approx. Hrs. required
1	I	Function	01
2	II	Limits I	01
3	II	Limits II	01
4	III	Derivative I	01
5	III	Derivative II	01
6	III	Derivative III	02
7	III	Second Order Derivative	01
8	IV	Application Of Derivative	02
9	V	Vector	02
10	VI	Statistics	01
11	VI	Probability	01
12	VII	Complex Number	02
		TOTAL	**16**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Teacher guided self learning activities.
2. Applications to solve identified Engineering problems and use of Internet.
3. Learn graphical software: Excel, DPlot and Graph.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

Not Applicable

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Mathematics for polytechnic student (II)	S. P. Deshpande	Pune Vidyarthi Gruha
2	Higher Engineering Mathematics	B. S. Grewal	Khanna
3	Advanced Engineering Mathematics	H.K. Das	Khanna Publication
4	Calculus of single variable	R.T. Smith	Tata McGraw Hill.
5	Engineering Mathematics	S.S. Shastrii	Prentice Hall Publication

B) Software/Learning Websites
1. http://schools.aglasem.com/1341
2. http://www.emathzone.com/tutorials/calculus/types-of-functions.html
3. http://www.mathsisfun.com/algebra/vectors.html
4. http://www.mathsisfun.com/data/
5. http://mathworld.wolfram.com/ComplexNumber.html

C) Major Equipments/ Instruments with Broad Specifications
1. Scientific Calculator
2. Computer system with Printer and Internet system.
3. LCD Projector.

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H		M								L
CO2	H		M								L
CO3	H		M								L
CO4	H		M								L
CO5	H		M								L

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE
COURSE : Applied Physics (PHY) **COURSE CODE** 6105

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	Online Exam Hrs.			Marks					
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
04	--	02	06	02	Max.	80#	20#	100	--	--	50	150
					Min.	32	--	40	--	--	20	--

 # Indicates online examination

1.0 RATIONALE:

Physics is associated with our lives at every stage. A good scientific attitude is essential for every human being to increase his/her quality of life. Today learning Physics has become more challenging because it is no more a watertight compartment. The approach is now inter-disciplinary and integrated with emphasis on the principle with their application.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Understand and apply the laws of Physics in various contexts.
2. Apply their knowledge of basic Physics to solve problems and present the solution in a clear and concise manner.
3. Acquire and develop experimental skills including the use of variety of laboratory instruments, taking of data for interpretation and its analysis.
4. Develop skill in the presentation of clear and concise written accounts of laboratory work.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Differentiate between various systems of measurement and identify proper unit of a physical quantity.
2. Identify the properties of Laser and Optical fibre as well as their engineering applications.
3. Acquire the knowledge about superconductors, indoor lighting.
4. Identify conductors & insulators of heat and analyse the relation between pressure, volume and temperature of gas.
5. Recognise elastic properties of materials and types of modulus of elasticity.
6. Identify the properties such as surface tension of liquids and viscosity of fluids.
7. Be aware of the propagation of sound and acoustics of building.
8. Distinguish between various effects produced by an electric charge.
9. Gain broad ideas about capacitors, semiconductors and p-n junction diode.
10. Discover the basics and applications of photoelectric cell and X rays.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Units & Measurements**	1a. Differentiate between fundamental &derived quantities/units.	1.1 Need of measurements, units of measurements, systems of units, SI units, fundamental & derived units, fundamental & derived quantities.	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	1b. Determine dimension of a physical quantity. 1c. Calculate different types of errors in measurements. 1d. Illustrate use of vernier caliper and screw gauge for linear measurements.	1.2 Dimension of physical quantity, dimensional analysis & its uses, order of magnitude & significant figures. 1.3 Accuracy & errors, instrumental, systematic and random error, estimation of error-average value, absolute error, relative error & percentage error, numerical. 1.4 Measuring instruments-vernier caliper and micrometer screw gauge.	
Unit-II **Light**	2.a. Calculate refractive index of material of prism. 2.b. Identify advantages of optical fibre over conducting wire. 2.c. Differentiate between types of optical fibre. 2.d. Recognise the principle of photometry. 2.e. Acquire knowledge about indoor lighting.	2.1 Refraction of light, refractive index and its significance, Refraction through prism, Derivation of Prism formula. 2.2 Total internal reflection of light (TIR), Optical fibre, advantages and disadvantages, construction of optical fibre. 2.3 Transmission characteristics of Optical, fibre, types of optical fibre-step & graded index fibre, Application of optical fibre. 2.4 Luminous flux, luminous intensity, illumination, candela, lumen, illuminance, inverse square law of illuminance, principle of photometry. 2.5 Indoor lighting-direct, indirect, semi-indirect, utilization factor, efficiency of source, maintenance factor, space to height ratio, total luminous flux, numericals.	08
Unit-III **Laser**	3a. Describe the principle of laser. 3b. Acquire knowledge about He-Ne laser 3c. Identify applications of holography	3.1 Laser, Properties of laser, spontaneous absorption, spontaneous emission and stimulated emission, population inversion, pumping, life time, meta-stable-state. 3.2 Construction, advantages & disadvantages of Helium-Neon Laser, applications of Laser. 3.3 Holography recording and Reconstruction of hologram, Application of holography.	06
Unit-IV **Current Electricity**	4a. Demonstrate ohm's law, use of metre bridge to find resistance. 4b. Use potentiometer to find internal resistance.	4.1 Ohm's law, Specific resistance, conductance, conductivity, Wheatstone's network, balancing condition, metre bridge. 4.2 Theory of shunt, fall of potential along wire, potentiometer. 4.3 Effect of temperature on resistance	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	4c. Identify positive/ Negative temperature coefficient of resistance of material. 4d. Calculate electrical energy consumed in kWh. 4e. Distinguish between properties of conductor & superconductor.	of metals, semiconductors & insulators, temperature coefficient of resistance, positive& negative temperature coefficient of resistance. 4.4 Heating effect of electric current, electric power, electric energy, kilowatt hour. 4.5 Superconductivity, graph of temperature versus resistance for mercury, superconductors, properties and application of superconductors, Numericals.	
Unit-V **Transfer of Heat & Gas laws**	5a. Illustrate conversion of temperature. 5b. Distinguish between good & bad conductors of heat on the basis of thermal conductivity. 5c. Calculate coefficients of expansion of solids. 5d. Identify the relation between pressure, volume & temperature of gas. 5e. Gain idea about specific heats of gases. 5f. Distinguish between isothermal, adiabatic, isobaric & isochoric process.	5.1 Temperature & heat, Celsius & Fahrenheit scale, conduction, convection, radiation. 5.2 Conduction of heat –variable state, steady state and temperature gradient, law of thermal conductivity, coefficient of thermal conductivity, applications of thermal conductivity. 5.3 Expansion of solids, Coefficient of linear, areal and cubical expansion and relation between them. 5.4 Statement of Boyle's law, Charle's law, Gay Lussac's law, concept of absolute zero, Kelvin scale of temperature. 5.5 General gas equation, universal gas constant, Work done in expanding a gas at constant pressure, specific heats of a gases and relation between them (equation only). 5.6 Isothermal, isobaric and isochoric and adiabatic process, difference between these processes, numericals.	08
Unit-VI **(ONLY For CE / ME / PS / AE)** **Elasticity**	6a. Differentiate between elasticity, plasticity & rigidity 6b. Calculate moduli of elasticity of materials. 6c. Illustrate applications of elasticity.	6.1 Deforming force, restoring force, elasticity, plasticity and rigidity. 6.2 Stress and strain with their types, elastic limit, Hooke's law, moduli of elasticity (Y, η, K) and their significance, Poisson's ratio. 6.3 Stress-strain diagram for wire under increasing load, factor of safety, applications of elasticity, Numericals.	06
Unit-VII **(ONLY For CE / ME / PS / AE)**	7a. Acquire knowledge about surface tension of liquids & its effects. 7b. Recognise effects of impurities &	7.1 Cohesive and adhesive force, range of molecular forces, sphere of influence, surface energy, Surface tension, molecular theory of surface tension.	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Surface Tension	temperature on surface tension of liquid. 7c. Calculate surface tension of liquid.	7.2 Effect impurities and temperature on surface tension, relation between surface tension & surface energy 7.3 Angle of contact, capillary action relation between surface tension, capillary rise, radius of capillary, application of surface tension, numericals.	
Unit-VIII **(ONLY For CE / ME / PS / AE)** **Viscosity**	8a. Identify applications of Pascal's law. 8b. Gain knowledge about viscosity of fluids. 8c. Find viscosity of fluids using Stoke's law 8d. Distinguish between types of flow of fluid. 8e. Identify significance of Reynold's number.	8.1 Pressure, pressure due to liquid column, hydrostatic paradox, Pascal's law and its applications. 8.2 Viscosity, velocity gradient, Newton's law of viscosity, coefficient of viscosity and its unit. 8.3 Stoke's law, expression for relation between coefficient of viscosity and terminal velocity. 8.4 Types of flow, Streamline and turbulent flow, advantages of streamline flow. 8.5 Critical velocity, Reynold's number and its significance, Bernoulli's principle & its applications, application of viscosity, Numericals.	06
Unit-IX **(ONLY For CE / ME / PS / AE)** **Sound and acoustic**	9a. Recognise frequency of audible & other sound waves. 9b. Calculate sound intensity in decibel scale. 9c. Illustrate properties & applications of Ultrasonic waves. 9d. Calculate reverberation time using Sabine formula. 9e. Plan acoustical planning of a hall.	9.1 Introduction to sound, frequency of sound and limits of Audibility, intensity of sound. 9.2 Reflection of sound, absorption coefficient, transmission coefficient, reflection coefficient, Loudness and intensity level, threshold of hearing & pain, Decibel scale. 9.3 Ultrasonic waves-properties & applications. 9.4 Echo, Reverberation, standard reverberation time, Sabine's formula. 9.5 Condition for good Acoustics, factors affecting acoustical planning of auditorium. Numericals.	08
Unit-VI **(only for EE / IF / CM / EL)** **Electrostatics**	6a. Calculate force between two charges using Coulomb's law. 6b. Illustrate different properties of electric lines of force. 6c. Calculate electric potential due an electric charge. 6d. Identify importance of potential of earth.	6.1 Coulomb's inverse square law, permittivity of medium, unit charge, electric field, electric field intensity. 6.2 Electric lines of force and their properties, electric flux, Electric flux density and relation between them, Electric flux associated with charge. 6.3 Electric potential, potential difference, potential gradient, dielectric strength, breakdown potential, expression for PD between two points due to point	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		charge, expression for absolute potential at point. 6.4 Potential due to charged sphere. (three cases), potential of earth, numericals.	
Unit-VII **(only for EE / IF / CM / EL)** **Capacitance**	7a. Illustrate charging &discharging of capacitor. 7b. Calculate effective capacitance of combination of capacitors. 7c. Identify types of capacitors. 7d. Calculate energy stored by a capacitor.	7.1 Capacitor, Capacitance and its unit, dielectric, effect of dielectric, dielectric constant, dielectric breakdown, Principle of capacitor. 7.2 Charging and discharging of Capacitor, Capacitor in series and parallel. 7.3 Types of capacitor- fixed & variable. 7.4 Expression for capacitance of parallel plate capacitor, capacitance of spherical and cylindrical capacitor equation only, energy stored by charged capacitor (equation only), numericals.	06
Unit-VIII **(only for EE / IF / CM / EL)** **Photo electricity and X-rays**	8a. Acquire knowledge about photoelectric effect. 8b. Identify characteristics of Photoelectric effect. 8c. Calculate KE of photoelectrons using Einstein's equation. 8d. Recognise production of X-rays. 8e. Illustrate properties & applications of x- rays.	8.1 Planck's quantum theory, Photo electric effect, experiment to study photoelectric effect. 8.2 Characteristics of photoelectric effect, threshold frequency, threshold-wavelength, photoelectric work function, stopping potential. 8.3 Einstein's photoelectric equation, photoelectric Cell and types, applications of photoelectric cell. 8.4 Origin of X-rays, production of X-rays using Coolidge's X-ray tube, minimum wavelength of X-ray. 8.5 Properties of X-rays, applications of X- rays, numerical.	06
Unit-IX **(only for EE / IF / CM / EL)** **Band Theory of Solids**	9a. Classify solids on the basis of band theory. 9b. Classify Semiconductors. 9c. Illustrate forward & reverse bias of P-N Junction diode.	9.1 Energy bands in solids-valence band, conduction band and forbidden energy gap, classification of solids on the basis of band theory : conductor, insulator and semiconductor. 9.2 Properties of semiconductor, classification of semiconductors intrinsic & extrinsic, P type & N type semiconductors. 9.3 P-N junction diode, forward & reverse bias characteristics of P-N junction diode, advantages of semiconductor devices.	06
		TOTAL	**64**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
Units common for all programmes					
I	Units and measurements	04	02	04	10
II	Light	02	04	04	10
III	Laser	02	04	02	08
IV	Current electricity	02	04	04	10
V	Transfer of heat & gas laws	02	04	04	10
Units ONLY FOR CE/ME/PS/AE					
VI	Elasticity	02	04	02	08
VII	Surface tension	02	04	02	08
VII	Viscosity	02	02	04	08
IX	Sound and Acoustics	02	02	04	08
Units ONLY FOR EE/IF/CM/EL					
VI	Electrostatics	02	04	02	08
VII	Capacitance	02	04	02	08
VIII	Photo electricity & X-rays	02	02	04	08
IX	Band theory of solids	02	02	04	08
	TOTAL	**20**	**30**	**30**	**80**

Legends: R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
		Common practicals	
1	I	Measure the dimensions of different objects using Vernier caliper	02
2	I	Measure the dimensions of different objects using micrometer screw gauge	02
3	II	Determine the refractive index of material of prism using spectrometer	02
4	IV	Verify ohm's law and determine resistivity of material of given wire.	02
5	IV	Verify law of resistance in series & parallel using metre bridge.	02
6	V	Determine coefficient of linear expansion using Pullinger's apparatus.	02
7	V	Verify Boyle's law	04
8	IV	Verify principle of potentiometer.	02

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
		Practicals for CE/ME/PS/AE	
1	VI	Verify Hooke's law of elasticity and determine Young's modulus of material of wire using Searle's apparatus.	04
2	VII	Determine surface tension of water using capillary rise method.	02
3	VIII	Verify Stoke's law of viscosity and determine coefficient of viscosity of given fluid.	04
4	IX	Determine coefficient of absorption of sound of given acoustical material.	04
		Practicals for EE/IF/CM/EL	
1	VII	Verify law of capacitance in series/parallel.	02
2	VII	Charging & discharging of capacitor and determine its time constant.	04
3	VIII	To study I-V characteristic of photoelectric cell.	04
4	IX	To study I-V characteristics of PN junction diode in forward/reverse biased condition.	04
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Prepare charts of Vernier caliper, screw gauge, travelling microscope, spherometer & spectrometer for lab demonstration.
2. Study acoustical planning of institute's auditorium hall.
3. Study lighting system of institute's conference hall.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show videos based on topics in the curriculum (total internal reflection, population inversion, different laws of physics) for better understanding of the concepts.
2. Show videos of practical demonstration before performance of practical for better understanding of practical.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Engineering Physics	R K Gaur & S L Gupta	Dhanpat Rai Pub.
2	Applied Physics	Prof. Arthur Beiser	Tata McGraw hill Pub.
3	Engineering Physics	D K Bhattacharya	Oxford University press
4	Physics	Halliday & Resnick	Wiley India

B) Software/Learning Websites

1. www.physicsclassroom.com
2. www.physics.org
3. www.physics.brown.edu
4. http://scienceworld.wolfram.com/physics/
5. http://hyperphysics.phy-astr.gsu.edu/hbase
6. www.msu.edu/~brechtjo/physics
7. http://www.rp-photonics.com/laser_applications.html
8. http://webphysics.davidson.edu/alumni/jimn/He-Ne/Pages/Theory.htm
9. http://physix_jun.tripod.com/fibres_4.htm
10. http://www.suite101.com/content/optics-total-internal-reflection-a51310
11. http://teachers.web.cern.Ch/teachers/archive/HST2001/accelerators/superconductivity/superconductivity.htm
12. http://en.wikipedia.org/wiki/Acoustics

C) Major Equipments/ Instruments with Broad Specifications
1. Vernier Caliper (LC = 0.02mm)
2. Micrometer screw gauge (LC = 0.01mm)
3. Aneroid barometer
4. Digital stop watch
5. Travelling Microscope
6. Regulated power supply
7. Apparatus to verify Boyles law
8. Stoke's App to measure viscosity
9. Metre bridge
10. Searle's apparatus for Young's modulus
11. Pullinger's apparatus
12. Gas burner with regulator, LPG gas cylinder and lighter
13. Spectrometer
14. Bunsen's photometer.
15. Ammeter, voltmeter, galvanometer, rheostat, resistance box
16. Potentiometer.

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H		M	M	L			H	L		L
CO2	H		M	L	L			M	L		
CO3	H		M	L	L			M			
CO4	H	M	M	L	M	L		M			L
CO5	H	M	M	L	M			M			
CO6	H	M	L	L	M			M			
CO7	H		L	L	M	L		M	L		L
CO8	H		M	L	M			L	L		
CO9	H		M	L	M			M	L		
CO10	H		L	L	M	L		L	L		L

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE
COURSE : Applied Chemistry (CHY) **COURSE CODE :** 6106

TEACHING & EXAMINATION SCHEME

Teaching Scheme				Examination Scheme								
Hrs / week			Credits	Online Exam. Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
04	-	02	06	02	Max.	80#	20#	100	--	--	50	150
					Min.	32	--	40	--	--	20	--

 # indicates online examination

1.0 RATIONALE:

Chemistry is the basic science course which is essential to all engineering programmes. The basic aim of teaching science is to develop in the students the habit of scientific inquiry, ability to establish the cause and effect. The study of basic concepts of chemistry like atomic structure, water treatment, metals and alloys, corrosion, lubricants, non metallic materials, fuels, environmental effects etc. will help the students to understand engineering courses where the emphasis is laid on the application of these concepts. Teaching of chemistry should be aimed at developing the right type of aptitude in the students and the ability to predict the result under given conditions.

Thus good foundation in basic science will help the students in their self development to cope up with continuous flow of innovation.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Develop scientific attitude in students.
2. Apply knowledge of chemistry in engineering situations.
3. Develop in students the habit of scientific enquiry, ability to establish cause and effect.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Apply the principles of chemistry to engineering situations.
2. Apply knowledge to correlate the properties of materials, their engineering uses and protection.
3. Write electronic configuration of various elements.
4. Apply various applications of electrolysis in engineering situations.
5. Illustrate various methods of softening of hard water.
6. Use the appropriate metals and alloys for different engineering applications.
7. Differentiate various types of corrosion and gain knowledge on control measures associated with corrosion
8. Select lubricants for machines.
9. Enlist the various characteristics of good fuel.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics & subtopics	Hours
Unit-I **Atomic Structure**	1a. Describe structure of an atom 1b. Explain Bohr's theory and distinguish between orbit and orbital	1.1 Structure of an atom, fundamental particles of an atom, concept of atomic number, mass number. 1.2 Bohr's theory, orbit, orbital, shapes of orbital, energy level, sub energy level	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics & subtopics	Hours
	1c. Describe rules for arrangement of electrons 1d. Give electronic configuration 1e. Describe the different types of compounds 1f. Explain the formation of various electrovalent and covalent compounds	1.3 Hund's rule, Aufbau principle, Rules for distribution of electrons in shell and sub shells. 1.4 Electronic configuration of atoms having atomic number 1-30 1.5 Electrovalent and covalent compounds, electrovalency and covalency 1.6 Formation of covalent compound e.g. H_2O, CH_4, O_2, N_2, C_2H_2 1.7 Formation of electrovalent compound e.g. $NaCl$, $CaCl_2$, $AlCl_3$	
Unit-II **Electro chemistry**	2a. Explain basic concepts of electrochemistry. 2b. Explain theory of ionization and factors affecting it 2c. Explain mechanism of electrolysis with examples. 2d. Describe faraday's first and second laws and solve numerical. 2e. Explain the applications of electrolysis 2f. Describe the construction and working of cells	2.1 Definition of electrochemistry, atom, ion, electrode, cell, electrolysis, electrolytes, non-electrolytes, anode, cathode. 2.2 Arrhenius theory of ionization, degree of ionization, factors affecting degree of ionization. 2.3 Electrolysis, mechanism, electrolysis of fused NaCl, aqueous NaCl using platinum electrode, $CuSO_4$ solution using Copper electrode. 2.4 Faraday's first and second law, 2.5 Numericals on Faraday's laws. 2.6 Process of electroplating and electro refining 2.7 Types of cell- e.g. Dry cell, Ni-Cd cell, introduction to solar cell	08
Unit-III **Water**	3a. Explain sources, impurities, properties of water. 3b. Differentiate between hard and soft water 3c. Describe the ill effect of hard water in domestic and industrial field 3d. Explain the different methods for removal of hardness of water. 3e. Describe the different treatments of drinking water 3f. Explain the concept of pH and pOH numerical related with it, applications of pH in engineering.	3.1 Sources of water- Rain, surface, underground water. Impurities in water- suspended, colloidal, dissolved, biological 3.2 Physical and chemical properties of water. 3.3 Hard and soft water. Types of hardness of water, Salts producing hardness of water, Units of hardness of water. 3.4 Domestic field- cooking, washing, bathing, drinking. Industrial field- paper, textile, dye, sugar industry. 3.5 Temporary hardness- boiling, Clark's method. 3.6 Permanent hardness- Permutit's method, ion exchange method. 3.7 Methods of purification of water:	10

Unit	Major Learning Outcomes (in cognitive domain)		Topics & subtopics	Hours
			Screening, Sedimentation, coagulation, filtration, Sterilization of water.	
		3.8	Definition of pH and pOH, pH scale and numerical.	
		3.9	Applications of pH in engineering. - city water supply, corrosion, effluent treatment, electroplating.	
Unit-IV **Metals**	4a. Explain the basic concepts of metallurgy. 4b. Describe different characteristics of metal. 4c. Explain the metallurgy of iron. 4d. Describe the physical properties and applications of metals.	4.1 4.2 4.3 4.4	Definition of ore, mineral, gangue Hardness, toughness, brittleness, tensile strength, malleability, ductility, machinability, weldability Flow sheet of metallurgy Steps of metallurgy: a. Concentration: physical, chemical. b. Reduction: smelting, alumino thermic process. c. Refining: poling, liquation, distillation, electrorefining.	08
		4.5	Physical properties and applications of Fe, Cu, Al, Cr, Ni, Sn, P	
Unit-V **Alloys**	5a. Describe the meaning of alloy, its preparation and its purposes of formation. 5b. Explain the classification of alloys and their applications	5.1 5.2 5.3	Definition of alloy, different methods of preparation of alloy, Purposes of formation of an alloy. Classification of alloys • Ferrous alloy- alloys steel and its applications. • Non ferrous alloy-Copper alloy-brass, bronze, gun metal, Monel metal Aluminum alloy-Duralumin • Solder alloy and its types.	06
Unit-VI **Corrosion**	6a. Describe magnitude of corrosion, meaning of corrosion, types of corrosion 6b. Explain the factors affecting the atmospheric and immersed corrosion 6c. Explain different methods of protection of metal from corrosion	6.1 6.2 6.3 6.4	Magnitude of corrosion, definition of corrosion, types of corrosion- a) Atmospheric corrosion- definition, types – b) corrosion due to oxygen, mechanism of corrosion due to oxygen, nature of film and its role in corrosion process c) Corrosion due to other gases Immersed corrosion- definition, it's mechanism, galvanic and concentration cell corrosion Factors affecting atmospheric and immersed corrosion Methods of protection of metal from corrosion- hot dipping, metal spraying, sherardizing, electroplating of metal cladding, organic coating-	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics & subtopics	Hours
		paints and varnish	
Unit-VII **Lubricants**	7a. Describe lubricants, its function and classification of lubricants. 7b. Explain lubrication and it's types 7c. Describe physical and chemical properties of lubricants 7d. Explain selection of lubricants for various machines	7.1 Definition of lubricant, function of lubricants, classification of lubricants. 7.2 Definition of lubrication, types of lubrication 7.3 Physical properties- viscosity, viscosity index, oiliness, flash and fire point, volatility, cloud and pour point. 7.4 Chemical properties- acid value, saponification value, emulsification. 7.5 Properties and names of lubricants used for various machines like delicate instruments, heavy load and low speed machine, gears, cutting tools, I.C. Engine, steam engine	08
Unit-VIII **Fuels**	8a. Describe fuels, characteristics of good fuel, types of fuel 8b. Describe solid fuel-e.g. coal in detail 8c. Describe liquid fuel e.g. -petroleum 8d. Describe gaseous fuel their advantages 8e. Distinguish between solid liquid and gaseous fuels	8.1 Definition of fuel, characteristics of good fuel, classification of fuel 8.2 Solid fuel-e.g. coal, it's types, properties of good coal, selection of coal, analysis of coal, determination of C and H in coal 8.3 Liquid fuel-e.g. petrol, classification of petrol, refining of petrol 8.4 Gaseous fuel e.g. LPG, natural gas, biogas 8.5 Advantages of gaseous fuel over solid and liquid fuels 8.6 Comparison between solid, liquid and gaseous fuels	08
		TOTAL	**64**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No	Unit title	Distribution of Theory marks			
		R level	U level	A level	Total
1	Atomic Structure	04	02	02	08
2	Electrochemistry	04	04	04	12
3	Water	04	04	04	12
4	Metals	04	02	04	10
5	Alloys	02	02	02	06
6	Corrosion	04	02	06	12
7	Lubricants	04	02	04	10
8	Fuels	04	02	04	10
	TOTAL	**30**	**20**	**30**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive,**

psychomotor and affective domain) so that students are able to acquire the desired programme outcome/course outcome.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* **Programme Outcomes/Course Outcomes in affective domain** *as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1 to 5	I	Inorganic qualitative analysis of any five solutions	10
6	II	Determination of electrochemical equivalent of copper.	02
7 to 8	III	Strength of given acidic solution using standard base solution.	04
9	III	Determination of pH of different unknown solutions.	02
10	III	Determination of chloride content in given water sample.	02
11 to 12	III	Determination of hardness of water	04
13	V	Determination of % of Fe in given ferrous alloy sample.	02
14	VI	To find relation between decrease in weight due to corrosion of metal and time.	02
15	VII	Determination of viscosity of given lubricating oil.	02
16	VIII	Determination of % of moisture in given coal sample by proximate analysis.	02
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:
Following is the list of proposed student activities like
1. Draw structures and write electronic configurations of atoms having atomic number 1-30.
2. Testing of water samples.
3. Sampling and collection of coal.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. CAI package, video demonstration, charts, models, visits and expert seminar/lecture.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Engineering Chemistry	Jain & Jain	Dhanpat Rai and Sons
2	A Text Book of Polytechnic Chemistry	V. P. Mehta	Jain Brothers
3	Engineering Chemistry	S. S. Dara	S. Chand Publication
4	Industrial Chemistry	B. K. Sharma	Goel Publication
5	Environmental Chemistry & Pollution control	S. S. Dara	S. Chand Publication
6	Engineering Chemistry	M. M. Uppal	Khanna Publisher New Delhi

B) Software/Learning Websites
1. http://chemistry.osu.edu/~woodward/ch121/ch2_atoms.htm
2. http://www.nyu.edu/pages/mathmol/textbook/atoms.html
3. www.chemguide.co.uk/atoms/properties/gcse.html
4. http://www.water-research.net/index.php/water-treatment/tools/hard-water-hardness
5. http://www.unitedutilities.com/documents/WaterhardnessFactSheet.pdf
6. http://www.explainthatstuff.com/alloys.html
7. http://www.gordonengland.co.uk/xcorrosion.htm

8. http://cuiet.info/notes/chemistry/Lubricants.pdf
9. http://www.ignou.ac.in/upload/unit-3.pdf

C) Major Equipments/ Instruments with Broad Specifications
1. Muffle furnace
2. Distillation Plant
3. Computer lab with 20 Computers for online theory exam.
4. Digital pH meter
5. Ostwald's viscometer
6. Electronic weighing balance (0 to 100gm capacity).
7. Digital Stop watch.
8. Lovibond comparator
9. Regulated DC power supply
10. Rheostat
11. Ammeter

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	M	M		L			L			L
CO2	H		M	M	L						L
CO3	H			M							L
CO4	H			M							L
CO5	H	M	L		M			L			
CO6	H	M		M	M						L
CO7	H			M	M						L
CO8	H			M	M						L
CO9	H										L

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in CE / ME / EE / IF / CM / EL / AE
COURSE : Engineering Graphics (EGR)   **COURSE CODE :** 6107

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
02	--	04	06	--	Max.	--	--	--	25	--	25	50
					Min.	--	--	--	10	--	10	--

1.0 RATIONALE:

Engineering Graphics is the language of engineers. The concepts of Engineering Graphics are used to develop & express the ideas and convey the instructions, which are used to carry out jobs in the Engineering field. This preliminary course aims at building a foundation for the further course in drawing and other allied courses.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Understand the use of drawing tools and equipments.
2. Understand the significance of engineering curves for various applications.
3. Understand the projections of point and line inclined to one reference plane.
4. Interpret the pictorial view and understand orthographic projection of the simple object.
5. Interpret the orthographic projection and understand pictorial view of the simple object.
6. Understand the significance of sectional view in the drawing.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Draw the engineering curves for given engineering applications.
2. Draw the projections of point and lines inclined to one reference plane only.
3. Draw and dimension orthographic projections of given object.
4. Interpret orthographic projections of object and draw isometric view.
5. Draw sectional view of simple objects as per IS convention.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Drawing instruments and their uses**	1a. Use Instruments for drawing, Scales, Lines, & their applications.	1.1 Letters and numbers (single stroke vertical) 1.2 Convention of lines and their applications. 1.3 I.S. codes for planning and layout. 1.4 Scale (reduced, enlarged & full size) plain scale and diagonal scale. 1.5 Sheet layout. 1.6 Geometrical constructions and drawing polygons	04
Unit-II **Engineering curves**	2a. Draw Conic curves, involutes, Cycloid. 2b. State the applications of engineering curves.	2.1 Methods for drawing an ellipse concentric circle, directrix focus and arc of circle method. 2.2 Methods for drawing parabola by directrix focus and rectangular method. 2.3 Methods for drawing a hyperbola by	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		directix focus and rectangular method. 2.4 Procedure for drawing involutes of circle and polygon (up to hexagon) 2.5 Procedure for drawing cycloid, epicycloid and hypocycloid	
Unit-III **Projections of Point and Line**	3a. Draw the projection of point 3b. Draw projection of line	3.1 Projection of point in the different quadrants. 3.2 Projection of line parallel to one plane and inclined to another reference plane only.	04
Unit-IV **Orthographic Projections**	4a. Interpret & draw orthographic views from given pictorial view.	4.1 Concept of Orthographic projections. 4.2 Conversion of pictorial view into Orthographic views only first angle projection method for simple objects.	06
Unit-V **Isometric Projections**	5a. Interpretation of isometric view. 5b. Draw isometric view from given orthographic views	5.1 Use of Isometric scale. 5.2 Comparison of true scale with isometric scale 5.3 Conversion of orthographic views into isometric View / projection	06
Unit-VI **Sectional View**	6a. Draw sectional view of simple drawing	6.1 Representation of sectional plane 6.2 Conversion of orthographic views into sectional View	04
		TOTAL	**32**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):
Not Applicable

6.0 ASSIGNMENTS/PRACTICALS/TASKS:
The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I	Two sheet on letters, numbers and representation of lines and redraw the figures.	08
2	II	Sheet on six engineering curves	12
3	III	Sheet on projections of line. (04 problems)	12
4	IV	Sheet on orthographic projection.(02 problems)	12
5	V	Sheet on isometric views and projection. (04 problems)	12
6	VI	Sheet on sectional view. (02 problems)	08
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:
Following is the list of proposed student activities like
1. Collect the information about application of engineering curves.
2. Sketch the orthographic views of simple engineering product in sketch book.
3. Sketch isometric view of simple engineering product in sketch book.
4. Sketch sectional view of simple engineering product in sketch book.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Show Three Dimensional models of different objects.
2. Use software's, CAI packages for better imagination.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Engineering Drawing	N. D. Bhatt	Charotar Publishing House
2	Engineering Drawing	P. J. Shaha	S. Chand
3	Engineering Drawing and Graphics	K. Venugopal	New Age International

B) Software/Learning Websites
1. AutoCAD
2. Solid works.

C) Major Equipments/ Instruments with Broad Specifications
Not applicable

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	H	H								L
CO2	H	H									
CO3	H	M	M	M					L		L
CO4	H	M	M	M					L		
CO5	H	M		H							

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in IF / CM / EL
COURSE : Fundamentals of Electrical Technology (FET)   **COURSE CODE** : 6113

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
04	--	02	06	03	Max.	80	20	100	--	--	50	150
					Min.	32	--	40	--	--	20	--

1.0 RATIONALE:

This course is introduced in the curriculum of Information technology, Computer technology and Electronics & Telecommunication Engineering to understand basic principles of electric devices & circuits & also to understand the operations of electrical drives. Student can apply knowledge to solve the electrical problems in their field.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Understand basics of electrical power.
2. Know various laws of AC and DC circuits.
3. Derive various terms of related to electrical circuits and machines
4. Understand construction, working and applications of various types of motor.
5. Describe need and circuit operations of UPS and stabilizers
6. Understand safety precautions while working with electrical installations
7. Understand Battery construction and maintenance
8. Understand wiring system for installations

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Apply basic terms and laws of electricity to understand an electric circuit operation.
2. Identify and state type of induced emf.
3. Derive and calculate various electrical parameters related to electrical circuit.
4. Explain transformer working principle and calculate its parameter.
5. Identify applications of DC motor and stepper motor.
6. State various single phase induction motor, know its applications
7. Compare Online and Offline state of UPS and know specification of batteries.
8. List various component with specifications used for electrical installation
9. Practise safety precaution while working with electrical installation.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Fundamentals of Electricity**	1a. State Ohm's law 1b. Define various terms of electricity 1c. Solve series and parallel resistive network. 1d. Understand and apply Kirchhoff's laws 1e. Describe temperature coefficient of resistance 1f. State definitions of work, power and energy and its SI units 1g. Apply various effect of electric current 1h. Apply various rules.	1.1 Electrical potential, current resistance, ohm's law 1.2 Electrical circuits, series & parallel resistance, current & voltage distribution, Kirchhoff's laws & its applications 1.3 Temperature coefficient of resistance 1.4 Work, power, energy, the SI units 1.5 Effects of electric current – magnetic, chemical, heating effect. Fleming's rules, right hand gripping rule.	08
Unit-II **Electromagnetic induction**	2a. Describe and apply Faradays law of Electromagnetic induction. 2b. Distinguish between static and dynamically induced emf 2c. Define self and mutually induced emf. 2d. State Lenz's law 2e. Explain and calculate energy stored in magnetic field.	2.1 Faraday's laws of electromagnetic induction Fleming's right hand rule 2.2 Static & dynamically induced emf, Lenz's law, self & mutual inductance. 2.3 Energy stored in magnetic field	06
Unit-III **AC fundamentals**	3a. Differentiate between single phase and three phase AC supply 3b. Define terms related to alternating quantity. 3c. Differentiate between RMS and average values of alternating quantity. 3d. Elaborate concept of reactance and impedance &power factor. 3e. Solve simple numerical on AC circuit. 3f. Differentiate between Star and Delta network.	3.1 Single phase & three phase AC supply 3.2 Concept of Cycle, Time period, Frequency, amplitude, RMS & average values of an Alternating quantity 3.3 Voltage & current relationship for pure resistive, inductive & capacitive circuits [No derivation] 3.4 Concept of reactance impedance, power factor, simple AC circuits & simple numerical based on it. 3.5 Current, Voltage & Power relationship for balanced three phase star & delta connected systems.	10
Unit-IV **Single phase transformer**	4a. State Principle and function of the transformer 4b. Identify parts and types of transformer 4c. Derive emf and transformation ratio equation of transformer 4d. Describe various losses of	4.1 Single Phase Transformer: Function & principle of operation, construction, classification of transformer according to construction and Voltage level. 4.2 EMF equation, voltage ratio, turns ratio, Current ratio, kVA	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	transformer 4e. Calculate regulation and efficiency of transformer 4f. Explain Isolation and pulse transformer.	rating. (Simple numerical) 4.3 Regulation, losses in transformer, efficiency. (Simple numerical) 4.4 Isolation transformer and pulse transformer.	
Unit-V **DC Motor**	5a. Explain constructional details of D.C. shunt motor. 5b. Describe working of DC shunt motor. 5c. Explain types and working of Stepper motor. 5d. Know applications of motors.	5.1 DC Shunt motor: Working principle, construction, operation, applications. 5.2 Stepper motor: types, working, applications	08
Unit-VI **Single Phase Induction motor**	6a. Enlist types of single phase induction motor 6b. Explain working of single phase induction motor 6c. Know applications of single phase induction motor.	6.1 Single phase induction motor: Construction, Classification, working and its applications	06
Unit-VII **UPS & stabilizers**	7a. Elaborate necessity of UPS 7b. Differentiate between online and offline UPS 7c. Draw block diagram of UPS 7d. Write function of each part of UPS 7e. Describe use and types of batteries used in UPS 7f. Define charging and discharging of batteries 7g. State meaning of Tickle charging 7h. Define Ampere hour capacity of battery, Specification of UPS. 7i. Elaborate maintenance need and schedule of batteries. 7j. Explain need of stabilizers 7k. Describe function of each part of stabilizers.	7.1 UPS: necessity of UPS for computers 7.2 Concept of on line and off line UPS 7.3 Block diagram of simple UPS, function of each block in short 7.4 Concept of cell/ battery, Types of batteries 7.5 Meaning of charging, discharging, & Tickle charging of battery. Ampere hours capacity of battery 7.6 Maintenance of lead acid cell 7.7 Specification related with UPS & their meaning. 7.8 Stabilizers (Servo): necessity of stabilizers for computers, block diagram, functions of each block.	07
Unit-VIII **Electrical Wiring**	8a. Identify types of wires 8b. Explain types of wiring system used for computer room 8c. Differentiate between light and power circuit.	8.1 Electrical wiring: Types of wires, meaning of 1\18, 3\20, 7\20 wires, 8.2 Simple wiring system like casing capping, Conduit wiring. 8.3 Meaning of power & lighting circuits used in computer room by giving layout of wiring diagram of small computer room.	07
Unit-IX **Electrical**	9a. Enlist types of fuses 9b. Describe Function of earthing, MCCB, ELCB	9.1 Necessity of Fuses, MCCB, ELCB, Types of fuses, 9.2 Necessity of Earthing,	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Safety	9c. Explain types of earthing 9d. Elaborate Safety precautions.	Earthing types, plate & pipe earthings. 9.3 Safety practices and Precautions to be taken while working with electrical installation.	
		TOTAL	**64**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Fundamentals of Electricity	04	04	04	12
II	Electromagnetic induction	02	06	02	10
III	AC fundamentals	02	04	04	10
IV	Single phase transformer	02	04	02	08
V	DC Motor	02	04	02	08
VI	Single Phase Induction Motor	02	04	02	08
VII	UPS & stabilizers for computers	02	06	--	08
VIII	Electrical Wiring	02	06	--	08
IX	Electrical Safety	04	04	--	08
	TOTAL	**22**	**42**	**16**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I	Verification of ohm's law	02
2	I	Measurement of current & voltage in series resistive circuits.	02
3	I	Measurement of current & voltage in parallel resistive circuits.	02
4	I	Verification of Kirchhoff's current law and Kirchhoff's voltage law.	04
5	III	Verification of Resistance with temperature.	02
6	III	Verification of current & voltage relationships for. I) star connection II) Delta connection.	06
7	IV	Voltage & current ratio of a single phase transformer.	04
8	V	Demonstration and identification of D.C machines parts.	02
9	VII	Demonstration of different parts of UPS, servo stabilizers, write down specification of UPS & their meaning.	04

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
10	VIII	Demonstration of different types of wires, wiring systems, switches & accessories by visiting to computer laboratory in institute. (Report should be written on it)	04
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Study of Panel wiring for IT panels & racks by observation through visits.
2. Collect at least one example of electrical Equipment/ Machines representing types of induced emf.
3. Collect information of domestic appliances which driven by single phase induction motor.
4. Observe and enlist use of stepper motor in computer peripherals.
5. Measure gauge of electrical wire find its current carrying capacity.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

Not Applicable

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Basics of electrical Engineering	V. N. Mittal	Tata McGraw Hill
2	Electrical Technology Vol. I &II	B.L. Theraja	S. Chand & Co.
3	Fundamentals of Electrical Engineering	M.N. Mittal	Everest Publishers House
4	A Course in Electrical & Electronic Measurement & Instrumentation	A.K. Sawhney	Tata McGraw Hill
5	Electrical Technology	Edward Hughes	E.L.B.S.

B) Software/Learning Websites

1. http://www.howstuffworks.com

C) Major Equipments/ Instruments with Broad Specifications

1. Three phase Auto transformer
2. Single Phase Transformer
3. Resistive load bank
4. Demo model of D. C. Machine
5. UPS

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	H		L								
CO2	H				L						
CO3			H	H							
CO4	H			H	L						
CO5	H				H						
CO6	H				L						
CO7		H			M	L					
CO8	H				M	L		H			
CO9			H					M		M	

H: High Relationship, M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE : Computer Fundamentals and Organization (CFO)   **COURSE CODE :** 6117

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
02	--	04	06	03	Max.	--	--	--	--	--	50	50
					Min.	--	--	--	--	--	20	--

1.0 RATIONALE:

This course provides a broad foundation for students so that they will get basic knowledge of using personal computers and internet. It describes the structure of computer and basic operations on computer as well as its peripherals. It provides a brief introduction to computer concepts, introduction of operating system and practical hands on office packages and uses of internet.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Use a computer system that has hardware and software components, which controls and makes them useful.
2. Use and handle the operating system as the interface to the computer system.
3. Set the parameter required for effective use of hardware combined with and application software's.
4. Use file mangers, word processors, spreadsheets, presentation software's and Internet.
5. Have hands on experience on operating system and different application software.
6. Use the Internet to send mail and surf the World Wide Web.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Describe a computer system and hardware and software components.
2. Recognize the use of different operating systems.
3. Use Microsoft Office and DTP package
4. Use the Internet
5. Use the computer system in various domains

4.0 COURSE DETAILS:

Units	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction to Computers**	1a. Introduction to computers 1b. Types & Applications of computers 1c. Concept of hardware 1d. The system Unit 1e. Components of computer	1.1 Generations & classification of computers 1.2 Micro, Mini, Mainframes and Super—Computers Applications of computers 1.3 Concept of hardware & Architecture of computer 1.4 Input unit, output unit, system unit--Computer peripherals--motherboards, memory, daughter cards, SMPS, connectors 1.5 Monitor, Mouse, Keyboard, Disk, CPU, Printer, Scanner, Modem, Video, Sound cards, Speakers.	06
Unit-II **Introduction to OS**	2a. Concept of windows accessories.	2.1 Introduction to OS GUI 2.2 Concepts of single user & multiuser OS with examples. 2.3 Windows-Concepts, Basic Operation of windows, windows accessories: 2.4 Notepad, Word Pad, Paint. 2.5 Linux Os – Concepts, Open office & their application. 2.6 Comparison of Windows & Linux.	04

Unit-III
 	
Office & DTP Package
	3a. Introduction to MS-OFFICE
	3b. Introduction to Desktop Publishing (DTP) Software
	3c. GUI Based Editing, Spreadsheets, Tables & Presentation
	3d. Open Office in Linux
		3.1 Word
		3.2 Excel
		3.3 PowerPoint
		3.4 Access
		3.5 PageMaker
		3.6 Application Using MS Office 2000 & Open Office.Org Menus
		3.7 Opening of menus, Toolbars: standard toolbars, formatting toolbars & closing of menus Quitting Document, Editing & designing your document
		3.8 Spreadsheets
		  a. Word Processor
		  b. Spreadsheet
		  c. Presentation
			08

Unit-IV **Introduction to Internet**	4a. Internet	4.1 Concept of Internet 4.2 Hardware and software requirement for internet--setup 4.3 Internet Services & application 4.4 Internet Security 4.5 Search Engines 4.6 E-commerce	06
Unit-V **Usage of Computer System in**	5a. Computer application	5.1 Offices, books publication, data analysis, accounting, investment, inventory control, graphics, database management, Instrumentation, Airline and	08

Units	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
various Domains		railway ticket reservation, robotics, artificial intelligence, military, banks, design and research work, real-time, point of sale terminals, financial transaction terminals.	
		TOTAL	**32**

Legends: R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)
Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

5.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
1	I, II	Assignments on computer system and its Architecture, peripherals.	04
2	II	Installation of Operating System like Windows XP/Vista/Windows 7, Linux.	04
3	II	Working with Windows desktop, start icon, taskbar, Recycle Bin, My Computer icon, The Recycle Bin and deleted files Creating shortcuts on the desktop, concept of folders and files? Folder selection techniques, Folder creation Moving or copying files, Renaming, Deleting files and folders.	04
4	II	Introduction to Window Operating System & its Accessories-- Paint, Explorer, WordPad, Notepad, The Calculator, Clock	04
5	II	Introduction to Linux OS & its accessories.	04
6	III	Implementation of features like auto correct, auto format, spells check, insert, table handling etc in Ms--Word.	04
7	III	Page formatting What is page formatting? Page margins Page size and orientation Page breaks, Headers and footers	04
8	III	Implements Formulas, functions and named ranges in MS-EXCEL.	04
9	III	Design a worksheet in MS-- Excel for Employee payroll system with conditional formatting.	04
10	III	Design presentations with Microsoft Power Point. Slides and presentations, Opening an existing presentation, Saving a presentation and design slide show giving animation effect.	04
11	III	Creation of tables using DBMS tools – MS Access. (Teachers should frame their own assignments for above tools which	04

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
		covers maximum features provided by respective software's)	
12	III	Design Business card, Wedding Invitation Card using Adobe page maker(DTP) software	04
13	II, III	Working with Linux open office – word, excel & presentation (openoffice.org).	04
14	II, III	Surfing the Internet Surfing the web via Microsoft Internet Explorer Surfing the Internet using Google chrome, mozilla Searching the Internet using Yahoo Commonly used search engines	04
15	IV	Generate your Email--ID using Email Service. Chatting on internet, searching and retrieval of information's using tools like Google.	02
16	IV	Using electronic mail Starting Outlook Express Using the Outlook Express window Changing the window layout Reading file attachment Taking action on message-deleting, forwarding, replying, Email & newsgroups Creating and sending emails Attached files	02
17	V	Introduction to e-commerce and related websites. Railway reservations, electricity bill, telephone/mobile bill payments. 1 Visit to MSBTE, DTE websites. 2 Visit to Software/Hardware brand Company's websites such as - Lenova Website, Intel website. 3 Search for latest configuration of Desktop Computer or laptop websites.	04
		TOTAL	**64**

6.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Compare and use working of different types of operating systems.
2. Assemble one system

7.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

Not Applicable

8.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Introduction to Computers	1 Peter Norton	Tata McGraw Hill
2	Computer Fundamentals Architecture	B. Ram	New Age International
3	Windows 7 Inside Out	3 Ed Bott Carl Siechert	Microsoft Press
4	Windows 7 or Windows XP For Dummies	Andy Rathbone	Wiley Publishing Inc
5	Structured computer Organization	Andrew S. Tanenbaum	Prentice Hall
6	Computer Fundamentals	V. Rajaraman	Prentice Hall

B) Software/Learning Websites

1. http://www.introductiontocomputers.org/
2. http://www.functionx. com/windows/index. htm
3. http://en. wikiversity.org/wiki/Introduction_to_Computers

C) Major Equipments/ Instruments with Broad Specifications

1. Hardware: Desktop Computer P-IV processor or higher
2. Software: MSOFFICE 10/13

9.0   MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	H	M	H			M				M
CO2		H	M	L			L				M
CO3							L				L
CO4	L	M									H
CO5		M	H	H						L	H

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Elements of Electronics (EOE)   **COURSE CODE   :** 6118

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.		Marks						
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
04	--	02	06	03	Max.	80	20	100	--	--	50	150
					Min.	32	--	40	--	--	20	--

1.0 RATIONALE:

This Course deals with fundamental devices used in all electronic circuits. The foundation for the working of computer or any of its peripherals is electronics. An Element of Electronics is a core Course which will help to students in understanding Digital Techniques, Microprocessors, Computer Architecture and Maintenance.

Students will develop proficiency in construction, working principle, characteristics and applications of electronic devices. On completion of learning of this Course, the student will have an insight to identify, classify different electronic devices assemble and troubleshoot simple electronic circuits.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Appreciate the importance of electronics in computer systems.
2. Compare and categorize Active and Passive Components.
3. Understand the construction and characteristic of semiconductor devices.
4. Understand the working of basic circuits such as rectifiers, Filters, amplifiers etc.
5. Build and test simple circuit.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes**:**
1. Identify the different Active and Passive Elements.
2. Illustrates the principle of working of simple electronic circuits.
3. Assemble Simple electronic circuits.
4. Troubleshoot the fault in a given circuit.
5. Identify faulty component/s in a given circuit.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Passive Circuit Elements**	1a. Classify different Active and passive Components. 1b. Compare Active and Passive Components 1c. Estimate resistance value of Resistors using color code method. 1d. State the Specifications of a Resistor, Capacitor and an Inductor. 1e. Draw the sketch of different types of Resistors, Capacitors and Inductors	1.1 Definition and application areas of Electronics. 1.2 Types of Electronic Components: Active & Passive-Definition and comparison. 1.3 Types of passive components: Resistor, Inductors and Capacitors 1.4 Resistors: Resistance, Definition, Symbol, Unit, Specifications Classification of Resistors – Fixed, Variable Resistor color coding	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	and state their principle of working.	1.5 Capacitors: Capacitance, Definition, Symbol, Unit, Specifications Classification – Fixed and Variable 1.6 Inductors: Inductance, Definition, Symbol, unit, specifications, Classification: Fixed and Variable	
Unit-II **Semiconductor diodes**	2a. Draw Symbols of different kinds of diodes. 2b. Draw constructional sketch of different diodes and state working principle. 2c. Draw circuit and explain operation of different types of diodes in forward and reverse biased condition. 2d. Draw & Explain VI Characteristics of Diodes. 2e. State applications of various diodes.	2.1 P-N Junction Diode: Symbol, construction, Working Principle, Formation of depletion layer in PN junction, Barrier Voltage. Biasing of the P-N Junction diode: Forward Bias, Reverse bias, VI characteristics (Forward and Reverse characteristics), Diode specifications: Forward voltage, Peak Inverse voltage, Reverse Saturation Current. 2.2 Types of Diodes • Zener Diode- Symbol, Operating Principle, V-I Characteristics, Zener Breakdown Voltage, Zener diode as a voltage regulator. • Optical diodes: Symbol, operating Principle, V-I Characteristics, applications of LED.	12
Unit-III **Regulated Power Supply**	3a. State Necessity of Regulated power supply and Draw Block diagram of it. 3b. Define rectifiers and state its necessity. 3c. Categorize and compare different rectifiers. 3d. Draw circuit diagram and explain operation of Half and full wave rectifiers with input and output waveforms. 3e. Define various terms related to rectifiers like Ripple Factor, Efficiency and PIV. 3f. Define filter and state its necessity. 3g. Draw circuit diagram and explain operation L, C, LC and CLC filters with Input-Output Waveforms. 3h. Define Voltage regulator and state its necessity.	3.1 D.C Power Supply: Types- Regulated and Unregulated, Need of Regulated Power Supply, Basic Block Diagram of Regulated Power Supply 3.2 Rectifiers: Definition, Need for Rectification. 3.3 Types of Rectifiers- Half wave Rectifier, Full Wave Rectifier (Centre Tapped and Bridge)– Circuit diagram, Operation and input- output Waveforms(No derivations), Definition of Ripple Factor, Efficiency, PIV, Comparison of Rectifiers 3.4 Filters: Definition, Necessity of Filters. Types of Filters – L, C, LC, CLC- Circuit Diagram, working with Input- Output Waveform. Comparison of Filters 3.5 Voltage regulators: Necessity, IC Regulators: 78XX, 79XX.	12
Unit-IV	4a. Compare between Unipolar	4.1 Introduction to Unipolar and Bipolar junction Transistors	14

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Transistors	and bipolar junction transistor. 4b. Explain working principle of NPN and PNP transistor. 4c. Draw the circuit diagram and Input/output Characteristics of CE Configuration of transistor. 4d. Identify and label different regions of operation of transistor on output characteristics. 4e. Draw construction diagram of N and P channel JFET and Draw Drain, Transfer characteristics of N Channel JFET. 4f. Compare between BJT and JFET 4g. state various applications of BJT and JFET	4.2 Bipolar junction Transistors: Definition, Types (PNP, NPN) Symbol, Working Principle of NPN transistor, Types of Transistor Configurations: CE, CB (Only circuit Diagrams), Characteristics of CE configuration: Input /Output Characteristics. Identification of Cut off, Active and Saturation Region, Input resistance, Output Resistance, Current gain (α and β). • Transistor Biasing- Need for biasing, DC load line, Q-point, Types of biasing – Voltage divider bias Transistor as a switch- circuit Diagram, Operation, application 4.3 Unipolar junction Transistors: Types (JFET and MOSFET) • JFET:N Channel and P channel – Symbol, Construction and working principle, Characteristics of N Channel JFET – Drain and Transfer Characteristics, 4.4 Comparison of JFET and BJT 4.5 Applications of BJT and FET.	
Unit-V **BJT Amplifiers and Oscillators**	5a. Define an amplifier and oscillator. 5b. Draw circuit diagram of single stage CE amplifier and explain working of CE amplifier. 5c. Define various terms Bandwidth, Current gain, Voltage gain and Power gain. 5d. State necessity of multistage amplifier& types of Coupling used in design of multistage amplifier. 5e. Draw circuit diagram of RC coupled, Direct coupled CE amplifier and state function of each component of circuit. 5f. List applications of each type of multistage amplifier. 5g. State the necessity of Oscillators.	5.1 BJT as an amplifier- Single Stage CE amplifier, Circuit Diagram, function of components, working and frequency response of an amplifier 5.2 Definition of terms Bandwidth, Current gain, Voltage Gain and Power Gain 5.3 Multistage amplifiers: Need for multistage amplifier Types of Coupling: RC coupled, Direct Coupled- Two stage amplifiers(CE)-Circuit Diagram, Frequency response and Function of each component Application of each type of multistage Amplifiers 5.4 Oscillators: Definition, Need for oscillators 5.5 Crystal Oscillator: Circuit Diagram, Operating principle and application	14

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	5h. Draw circuit diagram of Crystal Oscillator circuit and explain its working principle.		
Unit-VI **Integrated Circuits**	6a. Classify Integrated circuits. 6b. State advantages and Disadvantages of ICs. 6c. state various IC packages	6.1 Integrated Circuits: Definition, Advantages and Disadvantages 6.2 Classification – Analog and Digital ICs. 6.3 IC Packing's: DIP, Metal can, plastic	02
		TOTAL	**64**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
I	Passive Circuit Elements	02	02	02	06
II	Semiconductor diodes	06	08	02	16
III	Regulated Power Supply	04	10	04	18
IV	Transistors	04	12	04	20
V	BJT Amplifiers and Oscillators	04	08	04	16
VI	Integrated Circuits	02	02	--	04
	TOTAL	**22**	**42**	**16**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* **Programme Outcomes/Course Outcomes in affective domain** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I	Describe different tools and equipments used in basic electronic laboratory • Identify different Active and Passive circuit Elements.	04
2	I	Test and measure values of resistors and capacitors.	02
3	II	Plot VI characteristics of PN-Junction Diode and infer from it.	02
4	II	Assemble forward and reverse characteristics circuit of zener Diode on breadboard and plot VI Characteristics.	04
5	III	Observe the input/output waveforms of HWR rectifier on CRO • Without filter. • With filter and infer from it.	04
6	III	Observe the input/output waveforms of FWR rectifier on CRO	04

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
		• Without filter. • With filter and infer from it.	
7	IV	Plot Input & output characteristics of transistor in CE mode and infer from it.	04
8	IV	Assemble and study the circuit of transistor as switch on breadboard.	02
9	V	Plot Frequency response of single stage RC coupled amplifier and calculate Bandwidth and infer from it.	02
10	V	Plot Frequency response of Two stages RC coupled amplifier (CE mode) and calculate Bandwidth and infer from it.	02
11	VI	Identify and test different ICs.	02
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Download data sheets of Diodes (IN4001-IN4007), Transistors (BC546 BC547 BC548) and Voltage regulator ICs like 78xx, 79xx.
2. Market survey to collect data about Prices of different electronic Components and devices.
3. Assemble small/simple electronic circuit on breadboard.
4. Prepare layout and artwork of HWR and FWR circuit using PCB making software.
5. Visit to PCB making or assembling industry and collect data.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Show animation videos to demonstrate the working principles and constructional features of different types of electronic devices and circuits.
2. Arrange expert lecture of an Industry Person/Trained Faculties in the area of core electronics.
3. Arrange an Industrial visit to PCB Making/ Assembling industry.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Principles of Electronics	V.K. Mehta	S. Chand ISBN:8121924502, 9788121924504
2	A textbook of Applied Electronics	R.S. Sedha	S. Chand, 1st Edition
3	Basic Electronics and Linear Circuits	Bhargava (N.N.), Kulshreshtha (D.C.) and Gupta (S.C.)	Tata McGraw-Hill Education Pvt. Ltd. ISBN 10- 0074519654 /13: 9780074519653
4	Electronic Principles	Albert Malvino	Tata McGraw-Hills

B) Software/Learning Websites
1. http://www.alldatasheet.com
2. http://www.electronicstheory.com
3. http://www.electronictutorial.com
4. http://www.allaboutcircuit.com

C) Major Equipments/ Instruments with Broad Specifications

1. Multimeters, Ammeters, Analog Voltmeters
2. Cathode ray oscilloscope
3. Regulated power supply
4. Breadboards
5. V-I Characteristics of PN junction diode – Experimental kit
6. HWR and FWR – Experimental kit
7. Input/output Characteristics of CE mode Transistor – Experimental kit
8. single stage RC coupled amplifier – Experimental kit
9. Two stages RC coupled amplifier (CE mode) – Experimental kit
10. IC Tester

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	L	L								L
CO2	L		H								L
CO3	L		H							M	
CO4	L	L								M	
CO5	L	L								M	

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME :Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE :Computer Workshop Practice (CWP) **COURSE CODE :** 6119

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
--	--	04	04	--	Max.	--	--	--	--	--	50	50
					Min.	--	--	--	--	--	20	--

1.0 RATIONALE:

To make student aware with the use of various peripherals used in computer and how to connect them so that student can understand overall computer system.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Installed windows and Linux Operation System.
2. Explain and Use External Peripheral Devices.
3. Explain and Use Internal Peripheral Devices.
4. Connect different Peripheral Devices.
5. Setup Local Area Network.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Installation of various Operating Systems
2. Understand and use internal peripheral devices.
3. Understand and use external peripheral devices.
4. Connect different Peripheral Devices.
5. Setup Local Area Network.

4.0 COURSE DETAILS:

Note: The related theoretical contents be taught during practical

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit-I **Operating System Installation**	1a. Describe Windows 7/8/10 OS or latest Installation 1b. Describe Ubuntu Linux OS Installation	1.1 Introduction and Features of windows OS 1.2 Installation 1.3 Hard disk partition 1.4 Introduction and Features of Linux OS 1.5 Installation 1.6 Hard disk Partition
Unit-II **Introduction to Various External Peripheral Devices**	2a. Describe different types of hardware 2b. Use of different types of hardware.	2.1 Different types of keyboards 2.2 Different types of Mouse 2.3 Different types of Scanners 2.4 Different types of Modems 2.5 Different types of printers 2.6 CD writers, speakers, CD read /write drive 2.7 Microphones, LCD projectors, Pen drives, DVD drive 2.8 Different types of Monitors
Unit-III **Introduction to Various**	3a. Describe Internal Devices	3.1 Different types of hard disks 3.2 Different types of network Interface cards 3.3 Different types of cables such as data cables, printer cables, network cables,

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Internal Devices		power cables etc. 3.4 Motherboard Installation 3.5 Graphics Card Installation 3.6 Network Interface Card (NIC) Installation
Unit-IV **Physical Connections of different peripheral Devices**	4a. Describe Connecting different peripheral devices	4.1 Connection of Mouse to different ports 4.2 Connection of keyboards to different ports 4.3 Connection of Monitors 4.4 Connection of Printers (installation of printers). 4.5 Different switch settings of printers 4.6 Printer's self test 4.7 Jumper settings of hard disks 4.8 Attaching HDD and CD drives 4.9 Attaching Pen Drives and DVDs 4.10 Attaching Scanners
Unit-V **Networking**	5a. Describe Types of Networks 5b. Observe Network devices 5c. Identify and use of networking tool	5.1 Introduction to LAN, MAN, WAN 5.2 Setup LAN 5.3 Use of router 5.4 connection to switch 5.5 connecting RJ 45 connector to cat 6 cable

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):
Not Applicable

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:
The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* **Programme Outcomes/Course Outcomes in affective domain** *as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hours
1	I	Installation of windows operating system	07
2	I	Installation of Ubuntu Linux operating system	07
3	II, III	Observe all the peripheral devices available in the lab. Describe them in detail.	16
4	IV, V	Study of different ports such as serial, parallel, PS/2, RJ 45, USB ports.	11
5	IV	Observe different printer settings on different types of printers available in your lab.	11
6	V	Crimp cat 6 cable with RJ 45 connector	12
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Discuss features of different Operating Systems.
2. Collect specification of latest internal and external peripheral devices.
3. Dismantle all the connections of computer and try to connect them.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Arrange expert seminar of industry person in the area of hardware and maintenance.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Troubleshooting Your PC	Mr. David Stone & Alfred Poor	Prentice Hall India
2	A+ Complete	David Groth	BPB Publication
3	Computer Installation and Servicing	Balasubramaniam	Tata McGraw Hill
4	Reference Manuals of PC troubleshooting and maintenance	Manuals	--

B) Software/Learning Websites
1. http://www.tutorialspoint.com/computer_fundamentals/computer_hardware.htm
2. http://www.tutorialspoint.com/computer_fundamentals/computer_networking.htm
3. http://windows.microsoft.com/en-us/windows/installing-reinstalling-windows#1TC=windows-7.
4. http://www.wikihow.com/Install-Ubuntu-Linux

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments	Specifications
1	Desktop Computer	Processor: intel core i5, Memory: at least 4GB RAM Hard drive: at least 320GB hard disk
2	LCD Projector	Display Type: LCD, Light Output: 3200 Lumens
3	Network Printer	Printing Type: Black and White Printing Technology: Laser Print Resolution: 1200x1200 DPI
4	Switch	24 port switch
5	Router	Wireless standard: IEEE 802.11, 802.3 SSID Support : Yes, Frequency: 2.48 GHz WAN Type: RJ-45, DHCP: Yes
6	Scanner	Document Flatbed Scanner
5	Networking tool	Networking tool kit

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	L	H	H	H	M						M	L
CO2		H	M	H	M						M	L
CO3	L			H			M					
CO4		H	M	M		L				L	M	L
CO5		M	M	L			M	L	L	H	H

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Microprocessor (MPO)   **COURSE CODE   :** 6234

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.		Marks						
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
04	--	02	06	03	Max.	80	20	100	--	--	25	125
					Min.	32	--	40	--	--	10	--

1.0 RATIONALE:

Microprocessor is the heart of embedded system and computers. This course will provide basic knowledge of microprocessor architecture and programming in assembly language.
The student will be able to apply logics to various given problems and develop programs using assembly language construct that would help them to develop real time microprocessor based application programs.

2.0 COURSE OBJECTIVES:

The student will be able to,
   1. Describe architecture and Operation of 8085 and 8086 microprocessor.
   2. Recognize the function of various blocks of microprocessor, different types of Instructions, addressing modes of the 8085 and 8086 microprocessor.
   3. Understand different steps involved and tools used in program development.
   4. Write an assembly language program for desired application using 8086 microprocessor.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, Psychomotor and affective domain to demonstrate following course Outcomes:
   1. Compare between basic and advanced Microprocessor.
   2. Select a Microprocessor chip/IC for specific application.
   3. Develop assembly language program for simple application.
   4. Debug, test and execute various assembly language programs.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Microprocessor Basics**	1a. Define microprocessor and Differentiate between types of microprocessor 1b. State the Features of 8085 CPU. 1c. Describe the function of pins in the pin diagram of 8085 microprocessor with a sketch 1d. Describe the 8085 microprocessor architecture diagram with its functioning.	1.1 Concept of Microprocessor, Evolution of Microprocessor and types. 1.2 Microprocessor Bus organization: Data Bus, Address Bus and Control Bus. 1.3 8085 Microprocessor: Salient features, Pin diagram and description, Architecture (Block diagram), Register organization, (Accumulator, Flag Register, Program Counter). 1.4 Concept of Stack, stack pointer	10
Unit-II	2a. State the Features of 8086 CPU.	2.1 Features of 8086 Microprocessor. 2.2 8086 CPU-Pin Diagram and	12

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
8086 Microprocessor	2b. Describe pin diagram of 8086 microprocessor with a sketch. 2c. Describe the 8086 microprocessor architecture diagram with its functioning. 2d. Explain the instruction pipelining and memory segmentation. 2e. Explain the function of minimum and maximum mode signals of 8086 CPU. 2f. Compare various Microprocessors	description. 2.3 Architecture of 8086-Block diagram and description. 2.4 Register organization. 2.5 Concepts of pipelining, memory segmentation and Physical memory address generation. 2.6 Minimum and Maximum Mode operation (Signal Description). 2.7 Comparison of 8085 & 8086 CPU. 2.8 Comparison of 8088 & 8086 CPU	
Unit-III 8086 Instruction Set	3a. State and explain different addressing modes of 8086 CPU. 3b. Classify instruction set of 8086 microprocessor. 3c. Explain with the help of syntax function of various 8086 CPU instructions.	3.1 Machine Language Instruction format. 3.2 Addressing modes 3.3 8086 Instruction Set • Arithmetic Instructions • Logical Instructions • Data transfer instructions • Bit manipulation instructions • String Operation Instructions • Program control transfer or branching Instructions • Processor Control Instructions	12
Unit-IV Basics of Assembly Language Programming	4a. Describe various program development steps. 4b. Write algorithm and draw flowchart for given program statement. 4c. State and explain the function of various program development tools. 4d. Illustrate the functions of assembler directive and operators.	4.1 Program Development Steps • Defining problem • Writing Algorithms • Flowchart • Initialization checklist • Choosing instructions • Converting algorithms to assembly language programs 4.2 Program Development Tools • Editor • Assembler • Linker • Debugger 4.3 Assembler directives and Operators.	08
Unit-V 8086 Programming	5a. Develop Basic assembly language program using basic instruction for the given program statement. 5b. Run program using assembler and linker. 5c. Debug program using debugger.	5.1 Model of 8086 assembly language programs. 5.2 Simple assembly language programs - Addition, Subtraction, Multiplication, Division, series addition, 1's & 2's Complement, BCD addition, finding largest /Smallest number in array, finding even & odd numbers in array, Finding Positive and Negative Numbers in array, String Related	14

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		Programs- Block transfer, Reverse the string	

Unit-VI
 	
Procedure and Macro
	6a. Define procedure and macros
	6b. State and explain various types of Procedure
	6c. Develop simple Assembly language Program using Procedure and macros
		6.1 Procedure
		  • Defining Procedure - Directives used, FAR and NEAR
		  • CALL and RET instructions.
		  • Reentrant and Recursive procedures.
		6.2 Defining Macros.
		6.3 Simple Assembly Language Programs using Procedure and Macros
			08

		TOTAL	**64**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
I	Microprocessor Basics	04	08	--	12
II	8086 Microprocessor	04	08	04	16
III	8086 Instruction Set	04	06	06	16
IV	Basics of Assembly Language Programming	02	06	--	08
V	8086 Programming	04	06	10	20
VI	Procedure and Macro	--	04	04	08
	TOTAL	**18**	**38**	**24**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

*Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	II	To study Pin Diagram and Architecture of 8086 Microprocessor.	02
2	V	Develop and Execute assembly language program for addition/subtraction of two 16 bit numbers.	04
3	V	Develop and Execute assembly language program to find sum of series of numbers.	02
4	V	Develop and Execute assembly language program to obtain 1's and 2's Complement of 8 bit number.	02

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
5	V	Develop and Execute assembly language program for multiplication of two 16 bit unsigned numbers.	02
6	V	Develop and Execute assembly language program for division of two unsigned numbers (16/8, 32/16).	04
7	V	Develop and Execute assembly language program for addition of two 8 bit BCD numbers.	02
8	V	Develop and Execute assembly language program to find smallest/ largest number from array of n numbers.	04
9	V	Develop and Execute assembly language program to find Odd/Even number from array of n numbers.	04
10	V	Develop and Execute assembly language program for moving string from one memory location to another (using string instruction).	02
11	V	Develop and Execute assembly language program to display the string in reverse order.	02
12	V	Develop and Execute assembly language program to Display the Message string on command prompt.	02
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Develop unit wise topics related programs in laboratory.
2. Prepare the charts of block diagram & pin diagram of 8085 and 8086 Microprocessor.
3. Prepare the charts of Instruction set of 8086 Microprocessor.
4. Collect data about prices, specifications of 8085 & 8086 Microprocessor from local market.
5. Prepare evolution chart for microprocessor families.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Animation/Video presentation session.
2. Arrange expert lecture of an industry person.
3. Industrial visit to microprocessor based system manufacturing industry.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Microprocessor Architecture Programming and Application	Ramesh Ganonker	Penram International
2	Advanced microprocessor & peripheral	A.K. Ray & K.M. Bhurchandi	Tata McGraw-Hill Edition ISBN: 0070606587
3	Microprocessor & interfacing (programming & hardware)	Douglas Hall	Tata McGraw-Hill Edition ISBN:978007601673

B) Software/Learning Websites
1. http://www.cpu-world.com/Arch/8085.html
2. http://www.cpu-world.com/Arch/8086.html
3. http://www.intel.com
4. www.nptel.iitm.ac.in

C) Major Equipments/ Instruments with Broad Specifications
1. Microprocessor 8086 Trainer kit
2. Computer Systems with minimum PIII processor (or equivalent) and 512 MB RAM.
3. Multimedia Projector
4. Simulation Software(Tasm/Masm)

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	M	L									
CO2	L	H	L							L	
CO3	L		H	H			L				L
CO4	L		H	H			L			M	L

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Data Structure Using 'C' (DST)   **COURSE CODE :** 6235

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	04	07	03	Max.	80	20	100	50	--	25	175
					Min.	32	--	40	20	--	10	--

1.0   RATIONALE:

The primary objective of this course is to provide students ways of organizing data in computer so that it can be use efficiently. An emphasis on design and implementation of abstract data structures for solving complex problems.

2.0   COURSE OBJECTIVES:

The student will be able to,
1. Analyse data structure organization & classification.
2. Explain and apply sorting and searching techniques on data.
3. Apply the data structure stack, queue and link list in the application program.
4. Apply the data structure Trees and graphs in the application program.
5. Understand the use of data structure in real world applications.

3.0   COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Analyze and used data structure organization & classification.
2. Use various Searching and sorting techniques for solving problems
3. Identify and applied abstract data types like stack, queue and Link List.
4. Select the appropriate data structure for real world applications.
5. Apply different searching and sorting techniques.
6. Apply different algorithms to solve the real world problem.

4.0   COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction to data structure**	1a. Define Basic Terminology 1b. List Operations on data structures 1c. Approaches to design an algorithm 1d. Estimate Complexity 1e. Interpret Big 'O' Notation	1.1 Basic Terminology • Elementary data structure organization • Classification of data structure 1.2 Operations on data structures • Traversing, Inserting, deleting • Searching, sorting, merging 1.3 Different Approaches to designing an algorithm • Top-Down approach • Bottom-up approach 1.4 Complexity • Time complexity • Space complexity 1.5 Big 'O' Notation	06
Unit-II	2a. Introduction to sorting 2b. Analysis Efficiency of	2.1 Introduction 2.2 Efficiency of Sorting Algorithms	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Searching & Sorting Methods	sorting algorithms 2c. Explain and distinguish Sorting Techniques 2d. Explain Searching Techniques	2.3 Searching Methods • Linear search • Binary search 2.4 Sorting techniques • Bubble Sort, • Selection Sort, • Insertion Sort, • Merge Sort, • Radix Sort (only algorithm), • Shell Sort (only algorithm), • Quick Sort (only algorithm)	
Unit-III **Stack and its Applications**	3a. Introduction to stack 3b. Applications of Stack	3.1 Introduction to Stack. • Stacks as an Abstract Data Type • Primitive operations of stacks • Representation of Stack through arrays, linked list. 3.2 Application of Stack • Reversing a list • Polish notations • Conversion of infix to postfix expression • Evaluation of postfix expression • conversion of infix to prefix expression • Evaluation of prefix expression • Recursion	06
Unit-IV **Queue and its Applications**	4a. Introduction to queue 4b. Types of queue 4c. Application of Queues	4.1 Introduction • Queue as an Abstract Data Type • Representation of Queues • Operations on queue: Searching, Insertion, Deletion. 4.2 Types of Queue • Circular Queues • Double Ended Queue • Priority Queue 4.3 Application of Queues	06
Unit-V **Linked List**	5a. Introduction to linked list 5b. Types of linked list 5c. Operations on linked list	5.1 Introduction, • Terminologies: Node, Address, Pointer, Information, Next, Null • Pointer, Empty list. 5.2 Types of Linked list • Linear list • Circular list • Doubly list 5.3 Operations on a singly linked list • Traversing a singly linked list • Searching a linked list • Inserting a new node in a linked list at front, middle and end. • Deleting a node from a linked list from front, middle and end.	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours

Unit-VI
 	
Trees
	6a. Introduction to Trees
	6b. Types of tree
	6c. Expression tree
		6.1 Introduction
		• Terminologies: tree, degree of a node, degree of a tree, level of a node, leaf node, Depth / Height of a tree, In-degree & out-degree, Directed edge, Path, Ancestor & descendant nodes.
		6.2 Tree Types and Traversal Methods
		• Type of Trees
		  o General tree
		  o Binary tree
		  o Binary search tree (BST).
		• Binary tree traversal (only algorithm)
		  o In order traversal
		  o Preorder traversal
		  o Post order traversal
		6.3 Expression tree
			06

Unit-VII **Graph theory and its Applications**	7a. Introduction to graphs. 7b. Graph Representation 7c. Explain Traversal of graphs 7d. Application	7.1 Introduction • Terminologies: graph, node (Vertices), arcs (edge), directed • graph, in-degree, out-degree, adjacent, successor, predecessor, • Relation, weight, path, length. 7.2 Representations of a graph • Array Representation • Linked list Representation 7.3 Traversal of graphs • Depth-first search (DFS). • Breadth-first search (BFS). 7.4 Applications of Graph	08
TOTAL			**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Introduction to data structure	04	04	02	10
II	Searching & Sorting Methods	04	04	06	14
III	Stack and it's applications	04	04	04	12
IV	Queue and its applications	04	04	04	12
V	Linked List	04	04	02	10
VI	Trees	02	04	04	10
VII	Graph theory and its applications	02	04	06	12
	TOTAL	**24**	**28**	**28**	**80**

Legends: R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* **Programme Outcomes/Course Outcomes in affective domain** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
1	I	Implement various operations on one dimensional array. E.g. insertion and deletion.	04
2	II	Implement various sorting techniques.	08
3	II	Programs for implementing various searching techniques. -Linear search -Binary search	08
4	III	Implement PUSH and POP operations of stack using array	04
5	III	Implement recursive programs: factorial, Fibonacci series	04
6	III	Implement program to evaluate postfix expressions.	04
7	IV	Implement Program for demonstrating queue operations.	08
8	V	Implement Program based on singly Linked lists.	08
9	VI	Implement Program based on trees Creating a binary tree, in order, preorder and post order traversal of binary tree, deleting a node from binary tree.	08
10	VII	Assignment on Graph theory	04
11	I to VII	Compute the time and space complexity with Big 0 for following programs (Addition of 2 no's, Factorial of Number and Printing numbers from 1 to 10 using for loop)	04
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Discuss various algorithms and its complexity.
2. Compare various searching and sorting methods.
3. Prepare seminars on various topics like stack, queue etc.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Concept will be introduced in lectures using charts or ppt.
2. Arrange expert seminar of industry person in the area of data structure and algorithm.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Fundamentals of data structure	Ellis Horowitz, Sartaj Sahni	TMH Publications
2	Data Structures	Tremble and Sorenson	TMH Publications
3	Teach Yourself data Structure and Algorithms in 24 Hours	Robert Lafore.	BPB Publication
4	Data Structures Using C	M. Radhakrishnan, V. Srinivasan	BPB Publications

B) Software/Learning Websites

1. http://freevideolectures.com/Course/2519/C-Programming-and-Data-Structures
2. http://www.nptel.iitm.ac.in/video.php?subjectId=106102064
3. www-old.oberon.ethz.ch/WirthPubl/AD.Pdf
4. http://www.roseindia.net/tutorial/datastructure

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments	Specifications
1	Desktop Computer	PC Specifications to be followed: Processor: i3 or i5 RAM: 4 GB or better HDD: 1 TB SATA Monitor: TFT LCD OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate Antivirus: User License for three year
2	LCD Projector	Display Type: LCD Light Output: 3200 Lumens
3	Turbo C	Turbo C 3
4	C free 5	C free 5

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	H	H	M	M	L		L	M		
CO2	H	M	H	H	M		L	L			M
CO3		M	H	H	M			L		M	M
CO4		H	H	H	M	L		L	M		M
CO5		H	H		H	L	M	L		M	
CO6		H	H	M						M	M

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Database Management Systems (DBM)   **COURSE CODE :** 6236

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme						
Hrs / week			Credits	TH Paper Hrs.	Marks						
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	04	07	03	Max.	80	20	100	25	--	25	150
					Min.	32	--	40	10	--	10	--

1.0 RATIONALE:

The aim of this course is to get broad understanding of the basic concepts of database management systems in particular relational database system. The student will also develop the skills to use Database package as a backend for developing database application

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Create databases and maintain relation between the databases.
2. Explain concepts of database system with client server architecture.
3. Design database using normalization rules and the normalize database.
4. Write & execute SQL queries.
5. Apply and Develop concepts of data modelling, security and integrity constraints.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Explain Database concepts, client server architecture and database languages.
2. Draw ER diagram and Design database using Normalization.
3. Design and Maintain Database by using SQL queries.
4. Write PL/SQL Programme, Apply concept of views, trigger and Cursor on database
5. Apply security and Recovery concept on database

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Basic Concept of DBMS and Data Models**	1a. Explain the concept of a data, database and DBMS. 1b. Explain the concept of RDBMS. 1c. Describe the database languages and overall structure of DBMS. 1d. Describe architecture of Client server system	1.1 Concept of Data, Database, database management System. Disadvantages of file Processing system, advantages of DBMS over file processing system, Application of Database. 1.2 What is RDBMS, Difference between DBMS and RDBMS, name various software of DBMS and RDBMS 1.3 Data abstraction, Database languages, Instance and schema, Data independence – Logical and Physical Independence 1.4 Components of DBMS and overall Structure of DBMS. Database Users, functions of Database Administrator. 1.5 Introduction to client server architecture. Two/Three tier	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		Architecture.	
Unit-II **Relational Data Model and Database Security and Integrity Constraint**	2a. Explain Relational and Key concept. 2b. Implement and Draw an ER diagram 2c. Explain various data constraint and need of data security 2d. Describe various database constraint	2.1 Relational Model: - Basic Concepts Attributes and Domains. Key Concepts: Candidate key, Primary key, Foreign key and Super key. 2.2 E-R model, Components of ER Model, Types of attributes, Role indicator, weak & strong entity set. 2.3 Database Security: introduction, Data security requirements. 2.4 Integrity Constraints: Domain Integrity Constraints, Entity Integrity Constraints, Referential Integrity Constraints & on delete Cascade 2.5 Relational Algebra and Relational Calculus.	12
Unit-III **SQL and PL-SQL**	3a. Write SQL queries to create relational database and apply data constraint 3b. Write SQL queries for data manipulation 3c. Implement the Queries using various operators and functions 3d. Design the Queries for controlling in Database 3e. State the features and components of the PL/SQL 3f. Write simple PL/SQL Code using control structure and handle various exceptions. 3g. Create stored procedures and implement functions and create database trigger using PL/SQL	3.1 Introduction to SQL 3.2 Data Types in SQL 3.3 DDL Commands: CREATE, ALTER, DROP, TRUNCATE, DESC, RENAME, Truncate, Creating a User, Use of data Constraints 3.4 DML Commands: INSERT, UPDATE, DELETE, CALL 3.5 SQL Operators: Arithmetic Operators, Comparison Operators, Logical Operators, Set Operators, Range Searching operators-Between, Pattern matching operators-Like. 3.6 String functions and Date time functions 3.7 Queries using Group by, having and Order by clause, Joins, Types of Joins, Sub queries. 3.8 DCL Commands: COMMIT, SAVEPOINT, ROLLBACK, GRANT and REVOKE. 3.9 PL/SQL Introduction, PL/SQL block structure, variables, SQL statements in PL/SQL, PL/SQL control Structures, Cursors, Triggers, Functions, Packages, procedures. 3.10 Error handling in PL/ SQL	12
Unit-IV **Relational Database Design, Storage and File structure**	4a. Describe the process of Normalization & Design database Structure using various Normal forms to reduce redundancy. 4b. Explain the concept of file organization, organization of records in files and	4.1 Purpose of Normalization, Data redundancy and updating anomalies, Functional Dependencies and Decomposition, 4.2 Process of Normalization using 1NF, 2NF, 3NF, multivalued dependencies and BCNF. 4.3 File Organization, Organization of records in files, Storage of Object Oriented databases,	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	Indexing and Hashing	4.4 Basic concept of Indexing and Hashing.	
Unit-V **Query Processing and Transaction Processing**	5a. Explain general strategies for query processing, Equivalence Expression and relations in the response 5b. Explain the concept of transaction and its ACID properties	5.1 Query Processing 5.2 General Strategies for query processing 5.3 Equivalence expressions 5.4 Relations in the response 5.5 Concept of transaction, ACID Properties of transaction, States of transactions	06
TOTAL			**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Basic Concept of DBMS and Data Models	08	06	06	20
II	Relational Data Model and Database Security and Integrity Constraint	08	04	04	16
III	SQL and PL-SQL	06	04	08	18
IV	Relational Database Design, Storage and File structure	08	04	04	16
V	Query Processing and Transaction Processing	04	04	02	10
	TOTAL	**34**	**22**	**24**	**80**

Legends: R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* **Programme Outcomes/Course Outcomes in affective domain** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
1	I	Study and use of DBMS related software	02
2	II	Draw E. R. Diagrams for at least 8 different examples. (College management system, Banking system, Car Rental Co operation, hospital management system and so on)	06
3	III	Creation of table along with primary key and foreign key	06

75

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
4	III	Creating & Executing DDL and DML commands in SQL.	06
5	III	Executing Queries using the Select Command with Where, Having, Group by and order by clauses also execute the queries using aggregate functions.	06
6	III	Execute the queries for implementation of Inner, Outer and Cross Join.	06
7	III	Executing DCL commands in SQL.	06
8	III	Write the basic PL/SQL Programs and also Write a PL/SQL programs using if then else, for, while and nested loop.	06
9	III	Write a PL/SQL code to implement implicit and explicit cursors.	06
10	III	Write PL/SQL code for creating Procedures, functions and database triggers	06
11	IV	Demonstration of normalizations concept.	04
12	V	Study of Query processing and Transaction Procession	04
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Develop a MINIPROJECT for management system
   a. Library management system
   b. College management
2. Draw an E-R Diagrams for database.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Prepare database like student information, banking, library, insurance etc.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Database system concept	Korth and Silberschatz	McGraw Hill
2	An introduction to database system	Bipin Desai	Galgotia Publications
3	An introduction to Database	C. J. Date	Pearson
4	Sql/Pl-SQL	Ivan Bayross	BPB

B) Software/Learning Websites
1. http://www.wiziq.com/tutorial/130692-dbms
2. http://www.nptel.iitm.ac.in/video.php?subjectId=106106093
3. http://www.getahead-direct.com/gw-er-diagram-tutorial.htm
4. http://msdn.microsoft.com/en-us/library/ms130214.Aspx
5. WWW.W3Schools.com

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments	Specifications
1	Desktop Computer	PC Specifications to be followed: Processor: i3 or i5 RAM: 4 GB or better HDD: 1 TB SATA Monitor: TFT LCD OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate Antivirus: User License for three year
2	LCD Projector	Display Type: LCD Light Output: 3200 Lumens
3	MS Sql Server	MS Sql Server 2008 or 2012 or higher
4	Oracle	Oracle 10 G 11G or Higher
5	MySql	MySQL Community Server 5.5 or higher
6	Ms-Access	Mc Access 2007 or Higher

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	H	H	H	M	L		L	M		
CO2	H	M	H	H	M		M	L			M
CO3		M	H	M	M			L		M	M
CO4		H	M	M	M	L		L	M		M
CO5		H	H	M	M	L	M	L		M	

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE : Programming in C (PIC) **COURSE CODE :** 6237

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.			Marks					
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	04	07	03	Max.	80	20	100	25	--	25	150
					Min.	32	--	40	10	--	10	--

1.0 RATIONALE:

'C' is the most widely used computer language, which is being taught as a core course. C is general-purpose structural language that is powerful, efficient and compact, which combines features of high-level language and low-level language. It is closer to Man and Machine both. Due to this inherent flexibility and tolerance it is suitable for different development environments. Due to these powerful features C has not lost its importance and popularity in recently developed and advanced software industry. C can also be used for system level programming, C is still considered as first priority programming language.

This course will act as "programming concept developer" for students. It will also act as "Backbone" for courses like OOPS, VB, Windows Programming, JAVA, OOMD etc.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Develop logical skills to solve the basic computing problems
2. Learn the syntax and usage of C programming constructs.
3. Develop programs using different looping and branching statements.
4. Develop programs based on arrays and strings handling functions.
5. Use user-defined functions, structures and union.
6. Understand the concept of pointer in C Programming.
7. Develop programs using file handling.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Explain basic terminology used in C programming
2. Write, compile and debug program in C language.
3. Use basic element like control statements, array and strings
4. Design program by using decision structure, loops, functions and pointers.
5. Explain the basic concept of file handling.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Basics of C**	1a. Introduction and history of C 1b. Basics structure of "c"	1.1 Importance of integrated development environment(Turbo C) 1.2 History of C 1.3 Basics of Algorithm and Flowchart in C, Steps for executing a C program 1.4 Character set, Trigraph Character tokens, constants, variables, keywords C operators, C expressions, data types in c, keywords, c operators	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		1.5 Formatted input, formatted output 1.6 Structure of C program, Rules for writing a C program	
Unit-II **Flow Control Statements**	2a. Decision making and branching statements. 2b. Decision making and looping statements.	2.1 if statement (if, if-else, else-if ladder, nested if-else) 2.2 Switch case statement, continue, break statements. 2.3 while, do, do-while loop and for loop statements.	12
Unit-III **Arrays And Strings**	3a. Introduction of array 3b. Introduction of string and use of string library functions	3.1 One dimensional, two Dimensional and character arrays, accessing array elements. 3.2 String handling functions from standard library (strlen (), strcpy(), strcat(), strcmp()).	08
Unit-IV **Functions and Program Structure**	4a. Introduction of Functions 4b. Implement the function call by value and call by reference. 4c. Introduction to structure.	4.1 Need of functions, scope and lifetime of variables, defining Functions. 4.2 function call (call by value, call by reference), return Values, storage classes, category of function(No argument No return value, No argument with return value, argument with return value), recursion 4.3 Structures, Defining structure, declaring and accessing structure, Members, initialization of structure, arrays of structure.	08
Unit-V **Pointers**	5a. Explain Basic Concepts of Pointers. 5b. Implement concept of by call by value and call by reference	5.1 Introduction, Understanding pointers, declaring and accessing Pointers, Pointers arithmetic, pointers and arrays. 5.2 Concept of call by value & call by reference using pointers.	08
Unit-VI **File Handling**	6a. To learn basic file handling operations	6.1 File operations –opening, reading, writing & closing file	04
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Basics of C	04	04	04	12
II	Flow Control Statements	05	10	05	20
III	Arrays And Strings	04	04	04	12
IV	Functions and Program Structure	05	06	05	16
V	Pointers	04	04	04	12
VI	File Handling	02	04	02	08
	TOTAL	**24**	**32**	**24**	**80**

Legends: R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I	To Write an algorithm and flowchart in 'C' with sample example	04
2	I	Program which implement the formatted input and output statements in 'C' with sample example.	04
3	I	Program which contain various operators in 'C' with sample example.	04
4	II	Program for decision control statements (if, if-else, nested if-else with sample example for each type.	06
5	II	Program for decision control statement switch control statement in 'C'.	06
6	II	Program for Loop control statements in 'C'.	06
7	III	Program for single dimensional integer arrays in 'C'.	04
8	III	Program for multiple dimensional integer arrays in 'C'.	04
9	III	Program for string functions in 'C', by developing algorithm, flowchart & writing program for string comparison, copying and concatenation	04
10	IV	Program for functions in 'C' by developing algorithm, flowchart & writing program for finding factorial of a given no.	06
11	IV	Program to write the structure in 'C'.	04
12	V	Program to pointers in 'C', by developing algorithm, flowchart & writing program to print values of variables and their addresses and call by reference.	04
13	V	Program for array of pointers in 'C'.	04
14	VI	Program for basic file operations in c	04
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
   1. Prepare Mini project which covers the content of course

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

Demo lectures with power point presentations using LCD projector should be arranged to develop programming concepts of students.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Programming in 'C'	E. Balgurusamy	Tata McGraw Hill
2	Let us 'C'	Yashavant Kanetkar	BPB
3	Complete reference C	Herbert Shildt	Tata McGraw Hill
4	The C Programming Language	Brian Kernighan and Dennis Ritchie	Paperback

B) Software/Learning Websites
1. http://www.iu.hio.no/~mark/CTutorial/CTutorial.html
2. http://apex.vtc.com/c-programming.php
3. http://www.eskimo.com/~scs/cclass/cclass.html
4. http://www.cprogramming.com/tutorial/c/lesson1.html

C) Major Equipments/ Instruments with Broad Specifications
1. Hardware-Desktop, Computer P-IV processor.
2. Software-Turbo C-Editor

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	L	M	H	M	L		M				L
CO2	M	H	H	H	L		L				L
CO3	L	H	M	L		L	L			L	L
CO4	M	H	H	L				L	L	L	L
CO5	L	H		L	L						L

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)

COURSE : Object Oriented Programming (OOP)   **COURSE CODE :** 6238

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	04	07	03	Max.	80	20	100	50	--	25	175
					Min.	32	--	40	20	--	10	--

1.0   RATIONALE:

Object oriented programming has become the preferred approach for most software projects. Object oriented programming offers a new and powerful way to cope with complexity. Object oriented programming concepts are useful for constructing complex physical systems such as car, airplanes etc. Instead of viewing the program as a series of steps to be carried out, it views as a group of objects that have certain properties and can take appropriate actions. Among the Object oriented programming languages available C++ is most widely used language. Different programs based on Inheritance, polymorphism, encapsulation, overriding requires knowledge of C++. This course acts as a base for languages JAVA, VC++ & UML.

2.0   COURSE OBJECTIVES:

The student will be able to,
1. Write programs using objects & classes.
2. Develop programs to create and destroy the objects
3. Use existing operators for different meanings.
4. Using reusability concept.
5. Implement pointers for arrays, strings & object.
6. Describe polymorphism, virtual function & write program for same.
7. Apply formatted & unformatted console I/O operation & perform file related activities by using C++ streams.

3.0   COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Acquire the knowledge in the principle of object oriented languages.
2. Recognize the problem modeling approach with modularity using functions.
3. Develop the program by using object oriented techniques.
4. Develop the code reusability using the concept of inheritance and polymorphism.
5. Know the basics of File Operations.
6. Write the object oriented programs with template, complicated exception handling facilities and formatted/unformatted console.

4.0   COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Principle of Object Oriented Programming**	1a. History & features of c++	1.1 Basic concepts of object--oriented programming, Benefits of OOPs, 1.2 Object oriented languages, Application of OOPs, difference between oops and procedure oriented 1.3 Expressions and control structures	04
Unit-II	2a. Concept of Classes	2.1 Specifying a class, Defining member	06

82

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Classes and Objects.	and object	functions, Private member function 2.2 Arrays within a class 2.3 Creating objects, memory allocation for objects, 2.4 Static data & member function, 2.5 Arrays of objects, objects as function argument	
Unit-III **Functions in C++**	3a. Introduction to functions 3b. Concept of Function overloading 3c. Concept of friend and virtual function	3.1 Function Prototyping 3.2 Call by Value, Call by reference, Return by Reference 3.3 Inline function, 3.4 Default and constants arguments, 3.5 Function overloading 3.6 Friend and virtual functions, 3.7 Math library functions	06
Unit-IV **Constructors and Destructors**	4a. Concept of Constructor 4b. Introduction to destructor	4.1 Concept of Constructor (Default, Parameterized, copy), 4.2 Overloaded Constructors, 4.3 Constructor with default argument 4.4 Destructors.	04
Unit-V **Inheritance: Extending Classes**	5a. Introduction to inheritance and types of inheritance	5.1 Concepts of inheritance 5.2 Derived classes 5.3 Member declaration (Protected) 5.4 Types of inheritance (Single, multilevel, multiple, hierarchical, Hybrid inheritance), 5.5 Visibility Modes-- Private, Public and Protected 5.6 Virtual base classes, Abstract classes, 5.7 Constructors in derived Classes, Member classes.	08
Unit-VI **Polymorphism**	6a. Introduction to polymorphism and Types of Polymorphism 6b. Implement function overloading 6c. Implement operator overloading	6.1 Concept of polymorphism 6.2 Types of polymorphism - Compile time, Run time polymorphism 6.3 Function Overloading 6.4 Operator overloading (overloading unary & binary operators) 6.5 rules for overloading operators	06
Unit-VII **Pointers and Virtual Functions**	7a. Introduction to Pointers 7b. Concept of Virtual function	7.1 Pointers to objects 7.2 this pointers 7.3 Pointer to derived class, 7.4 virtual function, pure virtual functions 7.5 static and dynamic binding	06
Unit-VIII **I/O and File Processing.**	8a. Introduction to c++ stream and classes 8b. Implement file operations 8c. Introduction to Template	8.1 C++ Stream, Stream Classes, 8.2 Formatting and manipulating I/O 8.3 file operations(open, close, read, write) 8.4 file pointer and manipulation and commend line arguments,	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	8d. Concept and implementation of Exception handling	8.5 Templates 8.6 Class Templates 8.7 Member function templates. 8.8 Exception handling and its mechanism- throwing and catching.	
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
I	Principle of Object Oriented Programming	02	02	02	06
II	Classes and Objects	02	05	03	10
III	Functions in C++	03	04	03	10
IV	Constructors and Destructors	02	03	03	08
V	Inheritance: Extending Classes	04	04	04	12
VI	Polymorphism	04	04	04	12
VII	Pointers and Virtual Functions	03	04	03	10
VIII	I/O and file Processing.	04	04	04	12
	TOTAL	**24**	**30**	**26**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* **Programme Outcomes/Course Outcomes in affective domain** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I, II	Programs to input & output data (Simple programs).	04
2	II	Programs to create object of class.	04
3	II	Programs to create arrays of objects.	04
4	II	Program to access static member variables.	04
5	III	Programs using object as function arguments to friend function.	04
6	IV	Programs to define Class using constructor & destructor. (Default constructor, Multiple constructor, Parameterized constructor)	06
7	V	Program using Types of inheritance & virtual base class.	06
8	VI	Program to overload unary & binary operator.	04
9	VI	Program to implement function overloading.	06
10	VII	Program for (virtual functions) runtime polymorphism.	06
11	VII	Program for this pointer.	06

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
12	VIII	Program for file processing	06
13	VIII	Program on templates.	04
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Prepare a mini project by using Object Oriented Programming concepts.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Demo lectures with power point presentations using LCD projector should be arranged to develop

9.0 LEARNING RESOURCES:

A) Books

S.No.	Title of Book	Author	Publication
1	Object oriented programming with C++	Balgurusamy	Tata McGraw Hill
2	Object oriented programming in Turbo C++	Lafort Robert	Galgotia Publications Pvt. Ltd.
3	The C++ Programming Language	Bjarne Stroustrup	Pearson publications.

B) Software/Learning Websites

1. www.cplusplus.com/doc/tutorial/
2. http://atomicobject.com/resources/handbook-of-software/introduction-objective-c
3. www.cprogramming.com/begin.html
4. www.cpp4u.com/c++/tutorial/c++_tutorials.html

C) Major Equipments/ Instruments with Broad Specifications

1. Hardware: Desktop Computer P-IV processor or higher
2. Software: Turbo C-Editor

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	M	H	H	L			L				L
CO2		H	M		L		L				M
CO3		H	M	L			L				M
CO4		H	M		L	L					M
CO5		H	M								M
CO6		H	M		L		L				M

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE : PC Architecture and Maintenance (PCM) **COURSE CODE :** 6239

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	02	05	03	Max.	80	20	100	--	25	25	150
					Min.	32	--	40	--	10	10	--

1.0 RATIONALE:

The basic intention of this course is to introduce functionality and working of each component of computer system such as motherboard, processor, storage devices, I/O devices and other peripherals. Students will be able to select different components of computer system as per given specifications. It will help students to identify and troubleshoot different problems of peripherals of computer system.

Main intention of this course is to develop a troubleshooting skill of students regarding computer peripherals. This course will help our students to assemble computer system, install device drivers and software.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Install, configure operating system and Device drivers
2. Install, configure and maintain various components in computer system and peripheral devices.
3. Diagnose faults, repair and maintain computer system and its peripheral
4. Assemble the computer system

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Draw the various components of motherboard
2. Analyze the recording techniques and working of storage devices
3. Draw the construction and working of display devices like CRT, LCD
4. Explain the construction and working of Input/output Devices.
5. Explain the working of SMPS and power problems
6. Explain the ports of PC and interfacing technique of devices to ports

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Motherboard & Its Components**	1a. Introduction to CPU and its features 1b. Draw Chipset Architecture of PIV 1c. Introduction to Different types of Processor 1d. Explain different Buses on motherboards of Pentium PIV 1e. Explain cache memory	1.1 Concept of address lines, data lines, internal registers, CPU slot 1.2 North / South Bridge architecture and Hub architecture 1.3 Core2Duo, i3, i5, i7 processors 1.4 Overview and features of ISA, PCI-X, PCI-X press, AGP, PCMCIA, AGP, Processor BUS (no pin description) PCI versus PCI Express 1.5 Internal cache, External cache (L1, 1 L2, L3 cache) 1.6 DDR1, DDR2, DDR3.	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	1f. Describe features and types of SDRAM 1g. Identify different functions of BIOS.	1.7 BIOS & CMOS Set Up	
Unit-II **Storage Devices & Interfacing**	2a. Explain Recording Technique Of HDD 2b. Explain working of Hard disk 2c. Explain working of USB Drive 2d. Explain working of CDROM and DVD drive	2.1 FM, MFM, recording techniques. 2.2 Hard disk: construction and working 2.3 Track, Sector cylinder, cluster, landing zone, MBR, Zone recording, write precompensation 2.4 FAT basics: Low level formatting, High level formatting, partitioning 2.5 Introduction to file system FAT 16, FAT 32, NTFS 2.6 CDROM: Construction, Recording 2.7 DVD: Construction, Recording	08
Unit-III **Display Devices & Interfacing**	3a. Draw and describe block diagram of CRT color monitor 3b. Write down Characteristics of CRT monitor 3c. Introduction to LCD monitor and its working principles 3d. Explain video accelerator card	3.1 Block diagram Of CRT and function of each block 3.2 Dot pitch, Resolution, Video bandwidth, Horizontal scanning frequency, vertical scanning frequency, Interlaced versus non interlaced monitor 3.3 Advantages of CRT display related to LCD display 3.4 Functional block diagram of LCD monitor, working principle, advantages and disadvantages Types: Passive matrix and Active matrix 3.5 Basic block diagram of a video accelerator card	05
Unit-IV **Input and Output Devices**	4a. Explain Keyboard types 4b. Describe different types of Mouse 4c. Explain types of Scanner 4d. Compare internal and external Modem 4e. Identify different types of Printers and their characteristics	4.1 Keyboard and their types 4.2 Opto-mechanical, optical (New design) 4.3 Flat-Bed, Sheet-fed, Hand-held: Block diagram of flat Bed and specifications 4.4 Internal and External Modem: Block diagram and specifications 4.5 Printer Characteristics, Inkjet, Laser, Thermal 4.6 Block diagram of inkjet and laser printer.	08
Unit-V **Power Supplies**	5a. Draw block diagram of SMPS 5b. Define Power supply and factors 5c. Describe different types of Power problem 5d. Draw block diagram of Uninterrupted Power	5.1 Block diagram and working of SMPS 5.2 Poser supply form factor: AT, ATX 5.3 Rated wattage, Efficiency, Regulation, Ripple, Load regulation, Line regulation 5.4 Blackout, Brownout, surges and spikes. 5.5 Surge suppressor.	04

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	Supply(UPS)	5.6 Online and Offline UPS, working of UPS: Block diagram, advantages and disadvantages,	
Unit-VI **Interfaces**	6a. Describe different types of cables and connectors 6b. Identify different USB features. 6c. Explain RS 232 signal 6d. Introduction to Fire wire and Bluetooth	6.1 SCSI, SCSI cables and connectors, SCSI drive configuration 6.2 USB Features 6.3 RS232(Voltages and signal description) 6.4 Firewire features 6.5 Introduction to Bluetooth.	05
Unit-VII **PC Troubleshooting Maintenance and Tools**	7a. Explain POST in detail 7b. Explain Preventive maintenance of PC 7c. Draw and describe different type of Diagnostic Tools	7.1 POST sequence, Beep codes 7.2 Active, Passive, periodic maintenance 7.3 Preventive maintenance of peripherals of PCs, logic Analyzer, logic probe. 7.4 Norton utilities, QAPlus, PC Tools	08
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	0
I	Motherboard & Its Component	05	05	04	14
II	Storage Devices & Interfacing	04	06	04	14
III	Display Devices & Interfacing	02	04	04	10
IV	Input and Output Devices	04	05	05	14
V	Power Supplies	02	04	04	10
VI	Interfaces	02	04	02	08
VII	PC Troubleshooting & Maintenance and Tools.	04	04	02	10
	TOTAL	**23**	**32**	**25**	**80**

Legends: R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

S. No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	Drawing the motherboard layout of Pentium IV and studying the chipset through data books or Internet.	02
2	CMOS setup of Pentium.	02
3	Hard Disk Partitioning.	04
4	Formatting the Partitions Using File Systems	04
5	Installation of OS (Windows, Linux).	04
6	Details of HDD: Identify various components of HDD and write their functions	04
7	Install and understand the working of printer.	04
8	Installation of Scanner and Modems	04

9	Fault findings:
	  (a) Problems related to monitor.
	  (b) Problems related to CPU.
		04

	TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Visit to industry and collect data about PC and Hardware
2. Collect information about all hardware of PC and other resources
3. PC Assembling

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Show Computer hardware parts
2. Arrange visit to hardware industry
3. Arrange expert seminar of industry person in the hardware area.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Managing & Troubleshooting PCs	Mike Meyers, Scott Jernigan	Tata McGraw Hill
2	Bigelow's Troubleshooting, Maintaining & Repairing PCs	Bigelow	Tata McGraw Hill
3	The Complete PC Upgrade & Maintenance Guide	Mark Minasi	BPB Publication
4	Computer Installation & Servicing	D. Balasubramanian	Tata McGraw Hill
5	Upgrading & Repairing PCs	Scott Muller	Techmedia

B) Software/Learning Websites
1. http://www.karbosguide.com/
2. http://www.karbosguide.com/books/pcarchitecture/start.Htm
3. http://en.wikipedia.org/wiki/Computer_hardware

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments		Specifications
1	Hardware:	Desktop Computer	Processor: intel core i5, Memory: at least 4GB RAM Hard drive: at least 320GB hard disk
2		LCD Projector	Display Type: LCD, Light Output: 3200 Lumens
3	Software:	Windows	**Windows 7, 10 or Higher**
4		Linux	Linux
5		Drivers	Drivers for Desktop Computers

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H			H				M			
CO2		H			M	L				L	
CO3	H						M	M			
CO4		M	H		L						L
CO5			H			M			L		
CO6	L	L			H					M	

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology (IF)
COURSE : Data Communication and Networking(DCN) **COURSE CODE :** 6240

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	02	05	03	Max.	80	20	100	--	25	25	150
					Min.	32	--	40	--	10	10	--

1.0 RATIONALE:

The world in the information era has become network centric. A Computer networks has been growing with rapid technological progress. Computer communication through networking becomes essential part of our life. We can manage many application like Air Line Reservation, Railway Reservation, E-banking, E-Governance, On-Line shopping, E-learning etc. by clicking mouse button from our own place. Because of this, world become the global village. By considering importance of networking towards all aspects of our life, we here introduce basic concept of networks, network classification, network topologies, network devices, Transmission media, Network reference models, concept of TCP/IP.
This knowledge explores the student for understanding current network management technology.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Describe the data communication concepts
2. Identifying network & benefits of networks.
3. Describe communication media.
4. Compare different types of Topology.
5. Compare different types of network devices.
6. Compare OSI and TCP/IP protocol suite.
7. Configuration of TCP/IP

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Describe the data communication concepts
2. Distinguish the types of networks and its services
3. Identify the network devices and topologies
4. Categorized various wired and wireless media
5. Configured LAN using TCP/IP protocol

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction to Data Communication and Networking**	1a. Describe the Basic Concept of Data Communication 1b. Understand Analog and Digital Transmission Methods. 1c. Identify modes of data transmission and communication	1.1 Introduction, Fundamental Concepts, Data Communication, 1.2 protocols, Standards, organizations, Standard Bandwidth and Data Transmission Rate Analog Signal, Analog Transmission, Digital Signal, Digital Transmission, Digital Signal Analog Transmission, Baud Rate and Bits per second Modes of Data	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		Transmission and Multiplexing, Parallel and Serial Communication, Asynchronous, Synchronous and Isochronous Communication.	
Unit-II **Transmission Errors Detection and Correction, Basic Network Concepts**	2a. Understand Errors and Error Correction 2b. Write down the benefits of computer network. 2c. Distinguish between various types of Networks 2d. Classifying Networks by their Geography	2.1 Introduction, Error Classification, Types of Errors and Error Detection 2.2 Concept of Network -- Human Networks; Computer Networks; Network Plan. 2.3 Benefits of Network -- Sharing Information; Sharing Resources; Facilitating Centralized Management – Managing Software, Maintaining the Network, Backing Up Data. 2.4 Network classifications -- LAN, MAN, WAN; Classifying Networks by their Component Role -- Peer to Peer, Server based Network. 2.5 Network Services -- File Sharing; Printer Sharing; Application Services; E—Mail; Remote Access.	08
Unit-III **Network Topologies & Devices**	3a. Classifying Network topologies with their use 3b. Distinguish between different Network devices	3.1 Network Topologies -- Bus Topology; Ring Topology; Star Topology; Mesh Topology; Tree Topology; Hybrid Topology. 3.2 Network Control Devices --Hubs; Switches; Routers; Bridges; Repeaters; Gateways; Modems.	06
Unit-IV **Transmission Media**	4a. Describe transmission media. 4b. Explain types of wired media 4c. Describe types of wireless media and cellular telephone 4d. Distinguish between wired and wireless media	4.1 Introduction - Need of Transmission Media, Selection Criteria. 4.2 Types of Transmission Media- 4.3 Guided Media: Cable Characteristics, Types of Cable-Twisted Pair Cable, Co-axial Cable, Fiber Optic Cable. 4.4 Unguided media: Types of Communication Band-Microwave Communication, Radio wave Communication, Satellite Communication 4.5 Latest Technologies in Wireless Network-Bluetooth Architecture, Wi-Fi, 802.11 4.6 Cellular (Mobile) Telephone - Band in Cellular Telephony, Calls using Mobile Phones, Transmitting receiving / Handoff operations.	08
Unit-V **OSI Network Reference Model**	5a. Describe OSI Model and its layers 5b. Describe TCP/IP Reference Model. 5c. Comparison of the OSI and TCP/IP reference models.	5.1 OSI Reference Model Interlayer Communication – Data Encapsulation, Horizontal Communication, Vertical Communication, Encapsulation Terminology; Physical layer; Data link layer; Network layer; Transport layer; Session layer; Presentation layer;	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		Application layer. 5.2 TCP/IP Reference Model – Link; Internet; Transport; Application layer. 5.3 Comparison of the OSI and TCP/IP reference models.	
Unit-VI **TCP/IP Protocol**	6a. Recognize TCP/IP protocols 6b. Distinguish between TCP and UDP 6c. Describe P address classes, sub netting and registered and unregistered address 6d. Configured LAN using TCP/IP protocol.	6.1 TCP/IP Protocols -- SLIP and PPP; ARP, RARP; IP; ICMP, IGMP; TCP and UDP. 6.2 IP Addressing -- IP Address Assignments; IP Address Classes; Subnet Masking; Registered and unregistered Addresses; Introduction to IPV6, Comparison of IPV4 & IPV6. 6.3 TCP/IP Configuration -- Installing the TCP/IP Protocol; Configuring TCP/IP -- Configuring Basic TCP/IP Properties, Configuring Advanced TCP/IP Properties	10
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Introduction to Data Communication and Networking	04	04	04	12
II	Transmission Errors: Detection and Correction, Basic Network Concepts:	04	04	04	12
III	Network Topologies & Devices	04	04	02	10
IV	Transmission Media	08	04	04	16
V	OSI Network Reference Model:	02	04	08	14
VI	TCP/IP Protocol.	04	08	04	16
	TOTAL	**26**	**28**	**26**	**80**

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

Sr. No.	Unit No	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	II	To observe Components of Network in your Computer Network Lab. Draw layout of Lab	04
2	II	Creating User Account & Applying Account policies on standalone computer.	02

Sr. No.	Unit No	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
3		Use step by step procedure for i. e. File sharing & Printer sharing.	04
4	III	Identify network control devices and study there specifications.	04
5	III	Connecting RJ45 connector to the cable using crimping and prepare a Straight and Cross over Cable and test by Line Tester.	04
6	III	To Connect Computers in Star Topology using Wired Media and any Network control Device.	04
7	I, II, III	Create a Network using peer to peer network model.	02
8	VI	Implementation of network commands. (ipconfig, tracert, ping, telnet etc.)	04
9	Vi	Installation of TCP/IP Protocol.	02
10	Vi	Implementing a TCP/IP Network configuration	02
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Survey the various college/industry/institute and identify the type of network implemented
2. Survey the various college/industry/institute and identify the type of network topology implemented
3. Prepare charts on course.
4. Collect information regarding latest wireless technology.
5. Survey the various college/industry/institute and identify the type of network devices used
6. Survey the various college/industry/institute and identify the type of TCP/IP configuration installed

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Industry Visit
2. Expert Lectures

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Data Communications and Networks Tata McGraw Hill	Achyut S. Godbole	Tata McGraw Hill
2	Data Communications and Networking (Forth Edition)	Behrouz A. Forouzan	Tata McGraw Hill
3	Complete Reference Networking	Craig Zacker	Tata McGraw Hill
4	Computer Networking	Tularam M Bansod	Dreamtech, Wiley
5	Networking + Certification (Second Edition)	Microsoft Press	PHI(Prentice-Hall of India Private Limited)
6	Computer Network by	Andrew S. Tanenbaum	Pearson

B) Periodicals:
1. Computer Magazine 2) Computer Today 3) PC Quest

C) Software/Learning Websites
1. http://authors.phptr.com/tanenbaumcn4/
2. http://en.wikipedia.org/wiki/Computer_network
3. http://www.e-tutes.com/lesson1/networking_fundamentals_lesson1_1.htm
4. http://www.networktutorials.info/

D) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments	Specifications
1	LAN cables	Cat 5/6
2	RJ-45 cables	11 Pins
3	Crimping tool	Crimping tool
4	LAN Tester	LAN Tester
5	Computer	HDD: 40GB Processor: PIV or above Min RAM: 2GB or above, OS: 32 bit or 64 bit
6	Router	Wired/wireless
7	Switch	-16/24 ports

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H				M	H			M		M
CO2	H	M				H	L				
CO3		M			M			L			M
CO4	H		M		M				M		
CO5	H	M		M		H		M		M	M

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)

COURSE : Web Page Designing (WPD) **COURSE CODE :** 6241

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
01	--	04	05	--	Max.	--	--	--	50	--	50	100
					Min.	--	--	--	20	--	20	--

1.0 RATIONALE:

As recent year saw rapid growth of internet, so it is essential for Computer /IT students to get familiar with Web technologies that are use for developing both web based educational and business applications. These technologies are required for developing applications of various domains. So it is significant that the students of diploma develop capability to use Hyper Text Markup Language (HTML) technologies for developing professional static web environment.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Interpret the web platform, Building blocks of web site and preliminary concepts of web.
2. Describe the Basic structure, tags of HTML
3. Design the static web pages using tables, frames, images. As well should be able to accept user input using HTML forms
4. Design web pages with different types of CSS
5. Use and Apply HTML 5 and CSS 3 tags for Web page design as well use XML to store data

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Explain the Difference between Static and Dynamic Web Pages.
2. Design web pages using Different types of HTML Tags.
3. Design web pages with tables, frames, images as well as HTML forms.
4. Development of a website using Cascading Style Sheet
5. Identify, use and Design HTML5 and CSS 3 tags for designing advanced web pages and use of XML documents for storing data.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction to Web**	1a. Terminologies 1b. Basic Structure of Web Page 1c. Introduction to Web Server and Web Browsers 1d. Type of Web Pages	1.1 Web, Web Site, WebPage, Web Server, Web Browser, Search Engine 1.2 Basic tags of HTML Page Structure like DOCTYPE, HTML, HEAD, TITLE, BODY tags 1.3 Web Server, Need of Web Server, User, Client, Role of Client, Communication between user and client 1.4 Static Web Pages, Dynamic Web Pages	04
Unit-II **HTML**	2a. Components of HTML 2b. Basic Formatting	2.1 Tags, Open tag, close tag, attribute and end tag 2.2 Text Level Tags and Block level tags,	03

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Programming	Tags 2c. Lists 2d. Linking web pages. 2e. Color and Backgrounds	Adding comments in HTML 2.3 Ordered, Unordered and Nested List Definition Lists 2.4 URL: Types of URLs, Absolute URLs, Relative URLs Internal and External, Anchor Tag. 2.5 Text Color, Background Color, Link color, Font color	
Unit-III **Advanced HTML**	3a. Forms 3b. Table 3c. Frames 3d. Images	3.1 Form tag, action and method attribute. SELECT and OPTION tags Select Tag Submit, Reset, button 3.2 Table, TR, TD, TH tags, border, cell spacing, cell padding, width, align, bgcolor attributes, Caption Tag & is attributes, Spanning multiple rows and column 3.3 Concept of Frames, Frame tags and it's attribute, Frameset tags and it's attribute, Use of NOFRAMES tag, Frame targeting, concept of iframes 3.4 IMG tag and different Image formats, colors and backgrounds	03
Unit-IV **Dynamic HTML**	4a. Dynamic HTML 4b. Types of style sheets 4c. Selectors 4d. Style sheet properties	4.1 Introduce Style Sheets with different types. 4.2 Adding style to the document: Linking to style sheets, Embedding style sheets, Setting margin, width, border width, color, style, padding 4.3 CLASS rules, ID rules. 4.4 font, text, box, color and background properties	03
Unit-V **HTML5, CSS3 and XML**	5a. Introduction to HTML5 & CSS3 5b. HTML5 form 5c. Introduction to XML	5.1 Article, Fig. caption, Footer, Header, Mark Section Tags, CSS3: 2D &3D Transform 5.2 Color, Date, Datetime, Datetime-Local, Email, Month, Number, Range, Search, Tel, Time, Url, Week 5.3 Introduction To XML, HTML And XML Comparison, Document Type Definition, Components Of XML, Uses Of XML	03
TOTAL			**16**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):
Not Applicable

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

*Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I	Design Web page and apply some block level tags and some text level tags	06
2	II	Design Web page and include different lists.	06
3	II	Include various links in a Web page& set background color and document with text colour.	06
4	II	Design a web page with background image, different text colour for different paragraphs and set colours for links, active links and visited links.	08
5	III	Create HTML table, format contents in table cells and span the rows and columns.	06
6	III	Create basic frameset and format the frames within the frameset using different attributes. Also use frame targeting.	08
7	IV	Create a basic form using different input controls.	06
8	V	Create a web page and apply style sheet properties (font, text and box properties) with class and ID.	06
9	V	Design a web page to implement concept of CSS3 2D Transforms and CSS3 3D Transforms.	06
10	V	Create a XML file for storing basic information of student	06
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Visit various static and dynamic web sites and understand the difference.
2. Understand and observe the structure of Web sites with Mozilla web browser tools like developer->inspect
3. Sketch the structure of web site on paper with each details

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Study any real time web site
2. Identify various aspects of Web development by analyzing various sites online.
3. Prepare a website using various templates available.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	HTML and XHTML –The complete reference	Thomas Powell	Tata McGraw Hill, New Delhi.
2	HTML and Web Design –Tips and Techniques	Jamsa, King Anderson	Tata McGraw Hill, New Delhi.

B) Software/Learning Websites
1. http://www.w3schools.com/html/
2. http://www.html.net/

C) Major Equipments/ Instruments with Broad Specifications
Not applicable

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	H	M		M		M	M	M		L
CO2		H	M	M	M						L
CO3		M	M	M	M						L
CO4		M		M			M				
CO5		M	M	M	M						

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE : Operating System (OPS)   **COURSE CODE :** 6242

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Total	TH		Marks						
TH	TU	PR	Credits	Paper Hrs.		TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	02	05	03	Max.	80	20	100	--	--	25	125
					Min.	32	--	40	--	--	10	--

1.0 RATIONALE:

Operating system is the interface between the user and the computer system. It is the first piece of software to run on a computer system when it is booted. Its job is to coordinate and provide services for the execution of application software. This is core technology course and the knowledge of which is absolutely essential for Computer Engineers. It familiarizes the students with the concepts and functions of operating system. This course provides knowledge to develop systems using advanced operating system concepts.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Explore the various milestones in the history of Operating Systems and various generations of computers as well as the modern trends in Operating Systems
2. Provide a comprehensive introduction to understand the underline principles, techniques and approaches which constitute a coherent body of knowledge in operating system.
3. Outline the features and functions of operating systems provided by various system calls.
4. Differentiate various memory management and file management techniques.
5. Formulate the tools and the components of the operating system.
6. Design various algorithms for job scheduling.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Classify different types of operating Systems.
2. Identify services and functions of Operating Systems and explain the use system calls.
3. Implement a program for various process scheduling algorithms and evaluate problems based on scheduling algorithm.
4. Identify deadlock situation and apply preventive and corrective mechanism for handling deadlock.
5. Differentiate various Memory allocation methods and file accessing.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction**	1a. Distinguish between various generations of computer. 1b. Verify different components of operating system. 1c. State services & functions of Operating Systems.	1.1 Operating System: Batch operating system, Multi Programmed, Multitasking, Time Shared OS. Multiprocessor Systems, Distributed Systems, Cluster Systems, Real time systems. 1.2 Components of Operating systems: process management, main memory management, file management,	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	1d. Explore system calls, types and uses. 1e. Distinguish between different kernel architecture	system management. 1.3 Operating System Services 1.4 User-Operating System Interface 1.5 Virtual Machines 1.6 System Calls- Concept, Types and Uses 1.7 Simple Structure, Layered, Monolithic, Microkernel.	

Unit-II
 	
Processes Management & Thread overview.
	2a. Outline Process, process scheduling, schedulers.
	2b. Interpreter inter-process communication and synchronization.
	2c. Formulate critical section problem and solution to ensure the consistency of shared data
	2d. Evaluate thread, multithreading models.
		2.1 Process: Concept, process states, Process Control Block.
		  ▪ Process Scheduling: Scheduling Queues, Schedulers, Context switch.
		2.2 Inter-process communication: Introduction, shared memory system and message passing system, critical section problem, semaphores.
		2.3 Threads: Benefits, users and kernel threads.
		  ▪ Multithreading Models: Many to One, One to One, Many to Many.
			10

Unit-III **CPU scheduling and Process Synchronization**	3a. Evaluate CPU scheduling, various CPU-scheduling algorithms. 3b. Solve problems based on scheduling algorithms. 3c. Explore process Synchronization	3.1 Scheduling and its types: Objectives, concept, CPU and I/O burst cycles, Pre-emptive, Non- Pre-emptive Scheduling, Scheduling criteria. 3.2 Types of Scheduling algorithms: First come first served (FCFS), Shortest Job First (SJF), Shortest Remaining Time(SRTN), Round Robin (RR) Priority scheduling, multilevel queue scheduling 3.3 Process Synchronization: critical section problem, ▪ Semaphores and monitors.	12
Unit-IV **Deadlock**	4a. Identify Deadlock conditions and apply deadlock prevention algorithm. 4b. formulate deadlock recovery	4.1 Deadlock - System Models, Necessary Conditions leading to Deadlocks 4.2 Deadlock Handling - Preventions, avoidance, Banker's algorithm 4.3 Deadlock recovery.	08
Unit-V **File management and Memory Management**	5a. Distinguish between memory allocation methods 5b. Describe virtual memory: segmentation, paging. 5c. Evaluate files, file attributes and file structure.	5.1 Basic Memory Management - Partitioning, Fixed and Variable. Free Space management Techniques: Bitmap, Linked List. 5.2 Virtual Memory: Concept, Segmentation, Paging, Page table, Page fault. 5.3 File: Concepts, Attributes Operations, Types and File System Structure 5.4 Access Methods: Sequential, Direct, Swapping, File Allocation Methods- Contiguous, Linked, Indexed.	10
TOTAL			**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Introduction	04	04	04	12
II	Processes Management & Thread overview.	04	04	08	16
III	CPU scheduling and Process Synchronization	04	08	04	16
IV	Deadlock	04	04	08	16
V	File management and Memory Management	04	08	08	20
	TOTAL	**20**	**28**	**32**	**80**

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* **Programme Outcomes/Course Outcomes in affective domain** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hours
1	I	Write programs using the following system calls of UNIX operating system: Fork, exec, getpid, exit, wait, close, stat, opendir, readdir	04
2	III	Write a C Program for First Come First Serve Scheduling Algorithm.	02
3	III	Write a C Program for Shortest Job first Scheduling Algorithm.	02
4	III	Write a C Program for Shortest Remaining time first Scheduling Algorithm.	02
5	III	Write a C Program for Round Robin Scheduling Algorithm	02
6	III	Write a C Program for reader's writer's problem.	04
7	III	Write a C Program for Dining Philosophers problem.	04
8	III	Given the list of processes, their CPU burst times and arrival times, Write a c program display/print the Gantt chart for Priority and Round robin For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions).	04
9	III	Implement the Producer – Consumer problem using semaphores (using system calls).	04
10	IV	Implement Bankers Algorithm.	04
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Study the different operating system with its utilities.
2. Installation of different operating system.
3. Study the different PC configuration required for particular operating system.
4. Study the different CPU scheduling algorithms and write a C programme for algorithms.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert seminar on latest launches operating system in year.
2. Draw and stick tabular representation charts of configuration required for different operating system in laboratory.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1.	Operating system concepts	Silberschatz Galvin	John Wiley and Sons
2.	Operating System	Achyut S. Godbole	Tata McGraw Hill
3.	Operating System	William Stallings	Pearson

B) Learning Websites

1. http://163. 30. 150. 88/qualify/OS/os7_soltutions. PDF
2. www.tutorialspoint.com/operating_system
3. www.lynda.com/../252-0.html
4. www.os-templates.com/free -web-site-templates/educational

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments	Specifications
1	Desktop Computer	PC Specifications to be followed: Processor: i3 or i5 RAM: 4 GB or better HDD: 1 TB SATA Monitor: TFT LCD OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate Antivirus: User License for three year
2	LCD Projector	Display Type: LCD Light Output: 3200 Lumens
3	Microsoft Windows 7	1 gigahertz (GHz) or faster 32-bit (x86) or 64-bit (x64) processor* 1 gigabyte (GB) RAM (32-bit) or 2 GB RAM (64-bit) 16 GB available hard disk space (32-bit) or 20 GB (64-bit) DirectX 9 graphics device with WDDM 1.0 or higher driver
4	Windows 8	Processor: 1 gigahertz (GHz)* or faster with support for PAE, NX and SSE2 (more info) RAM: 1 gigabyte (GB) (32-bit) or 2 GB (64-bit) Hard disk space: 16 GB (32-bit) or 20 GB (64-bit) Graphics card: Microsoft DirectX 9 graphics device with WDDM driver.
5	Ubuntu	700 MHz processor (about Intel Celeron or better) 512 MiB RAM (system memory) GB of hard-drive space (or USB stick, memory card or external drive but see LiveCD for an alternative approach) VGA capable of 1024x768 screen resolution. Either a CD/DVD drive or a USB port for the installer media

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H		M	L					M	L	M
CO2	M	L	H		M			M	L	L	M
CO3	L	M	H	H	H	H		H	M	L	M
CO4		M	H	H	M	H	M	L	M	L	M
CO5			M		H	H	H	M	M	L	M

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME   : Diploma Programme CE / ME / PS / EE / IF / CM / EL / AE
COURSE   : Applied Mathematics (AMT)   **COURSE CODE**   : 6301

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	00	--	03	03	Max.	80	20	100	--	--	--	100
					Min.	32	--	40	--	--	--	--

1.0 RATIONALE:

The study of mathematics is necessary to develop in the students the skills essential for new technological development. This course introduces some applications of engineering, through which the students can understand mathematics with engineering principles.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Acquire knowledge of mathematical terms, concepts, principles and different methods.
2. Develop ability to apply mathematical method to solve engineering problems.
3. Acquire sufficient mathematical technique necessary for practical problems.
4. Apply the relation between mathematics and applications in engineering.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to solve engineering and applied mathematical problems using
1. Methods of integration
2. Definite integral and its application
3. Differential equation and its application
4. Numerical methods for solving algebraic and simultaneous equations
5. Laplace's transform.
6. Probability distribution.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours

Unit-I
 	
Integration
	1a. Solve integration problem using rules and formulae
	1b. Apply method of integration for solving problem
		1.1. Definition of integration, integral as anti-derivative, integration of standard functions.
		1.2. Rules of integration (Integral of sum or difference of functions, scalar multiplication)
		1.3. Methods of integration.
		   a. Integration by method of substitution & by using trigonometric transformation
		   b. Integration of rational functions & by method of partial fraction
		   c. Integration by parts
			12

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours

Unit-II
 	
Definite Integration And Its Application
	2a. Apply definite integration to solve engineering problems, area Volume and R.M.S. value.	2.1 Definite Integration
		   a. Definition of definite integral
		   b. Properties of definite integral with simple problems
		   c. Application of definite integration Area under curve, area bounded by two curves. Volume generated by revolution of curve, RMS value & mean value.
			08

Unit-III
 	
Differential Equations
	3a. To form and solve Differential Equation
	3b. Apply various method to solve differential equations
	3c. Solve engineering problems using differential equation.
		3.1 Definition of differential equation, order and degree of differential equation. Formation of differential equation for function containing single or double constants.
		3.2 Solution of differential equations of first order and first degree such as
		   a. Variable separable form
		   b. Reducible to variable separable
		   c. Homogeneous differential equation
		   d. Linear differential equation
		   e. Bernoulli's differential equation.
		3.3 Applications of differential equations.
			08

Unit-IV
 	
Numerical Methods
	4a. Solve algebraic equations by using Bisection method and Newton Raphson Method
	4b. Solve simultaneous Equations by using Gauss-Seidel method and Jacobi's method
	4c. Apply Lagrange's interpolation formula and Newton forward interpolation formula
		4.1 Solution of algebraic equations using iterative method
		   a. Bisection method
		   b. Newton-Raphson method.
		4.2 Solution of simultaneous equations containing three unknowns – iterative methods
		   a. Gauss-Seidel method
		   b. Jacobi's method
		4.3 Interpolation
		   a. Lagrange's interpolation formula
		   b. Newton's forward difference
		4.4 Interpolation formula
			08

Unit-V **Laplace transform**	5a. Acquire knowledge of Laplace transform and Inverse Laplace transform. 5b. Apply Laplace Transform to solve Differential Equations.	5.1 Definition of Laplace transform and standard formulae of Laplace transform 5.2 Properties of Laplace transform (linearity, first & second shifting, multiplication by t^n, division by t) 5.3 Inverse Laplace transform, using partial fraction 5.4 Laplace transform of derivatives 5.5 Application of Laplace transform for solving differential equation.	06
Unit-VI **Probability Distribution**	6a. Apply Binomial Distribution 6b. Apply Poisson's Distribution 6c. Apply Normal Distribution	6.1 Binomial distribution 6.2 Poisson's distribution 6.3 Normal distribution (simple examples)	06
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Integration	04	08	08	20
II	Definite Integration and its application	04	04	04	12
III	Differential Equations	04	08	04	16
IV	Numerical Methods	04	04	08	16
V	Laplace Transform	02	04	02	08
VI	Probability distribution.	02	04	02	08
	TOTAL	**20**	**32**	**28**	**80**

6.0 ASSIGNMENTS/PRACTICALS/TASKS:
Unit wise home assignment, containing ten problems.

7.0 STUDENT ACTIVITIES:
Following is the list of proposed student activities like
1. Teacher guided self learning activities.
2. Applications to solve identified Engineering problems and use of Internet.
3. Learn graphical software: Excel, DPlot, Graph etc.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
Not Applicable

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Mathematics for polytechnic student (III)	S. P. Deshpande	Pune Vidyarthi Gruha
2	Applied Mathematics	Kumbhojkar	Phadake Prakashan
3	Numerical Methods	S. S. Sastry	Prentice Hall Of India
4	Text book of Applied Mathematics, Volume I&II	P. N. Wartikar, J. N. Wartikar	Pune Vidyarthi Gruha Pune

B) Software/Learning Websites
1. http://www.mathsisfun.com/calculus/integration-definite.html
2. http://www.intmath.com/applications-integration/applications-integrals-intro.php
3. http://www.maths.surrey.ac.uk/explore/vithyaspages/differential.html
4. http://tutorial.math.lamar.edu/Classes/DE/LaplaceIntro.aspx
5. http://library2.lincoln.ac.nz/documents/Normal-Binomial-Poisson.pdf

C) Major Equipments/ Instruments with Broad Specifications
1. Scientific Calculator
2. Computer system with Printer, Internet system.
3. LCD Projector.

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
CO1	H		M								L
CO2	H		M								L
CO3	H		M								L
CO4	H		M								L
CO5	H		M								L
CO6	H		M								L

H: High Relationship, M: Medium Relationship, L: Low Relationship.

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme				TH Paper Hrs.	Examination Scheme							
Hrs / week			Credits		Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
--	--	02	02	--	Max.	--	--	--	--	--	50	50
					Min.	--	--	--	--	--	20	--

1.0 RATIONALE:

Environment essentially comprises of our living ambience, which gives us the zest and verve in all our activities. The turn of the twentieth century saw the gradual onset of its degradation by our callous deeds without any concern for the well being of our surrounding we are today facing a grave environmental crisis.

It is therefore necessary to study environmental issues to realize how human activities affect the environment and what could be possible remedies or precautions which need to be taken to protect the environment.

The curriculum covers the aspects about environment such as Environment and Ecology, Environmental impacts on human activities, Water resources and water quality, Mineral resources and mining, forests.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Understand and realize nature of the environment, its components and inter-relationship between man and environment.
2. Understand the relevance and importance of the natural resources in the sustainability of life on earth and living standard.
3. Comprehend the importance of ecosystem and biodiversity.
4. Identify different types of environmental pollution and control measures.
5. Correlate the exploitation and utilization of conventional and non-conventional resources.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Explain uses of resources, their overexploitation and importance for environment
2. Describe major ecosystem
3. Suggest measurers for conservation of biodiversity
4. Identify measures for prevention of environmental pollution
5. Describe methods of water management
6. Identify effects of Climate Change, Global warming, Acid rain and Ozone layer
7. Explain Concept of Carbon Credits
8. State important provisions of acts related to environment

4.0 COURSE DETAILS:

There are no separate classes for theory. The relevant theory has to be discussed before the practical during the practical sessions.

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit-I **Importance of Environmental Studies**	1a. Define the terms related to Environmental Studies 1b. State importance of awareness about environment	1.1 Definition, Scope and Importance of the environmental studies 1.2 Need for creating public awareness about environmental issues
Unit-II **Natural Resources**	2a. Define natural resources 2b. Identify uses of natural resources, their overexploitation and importance for environment	2.1 Uses of natural resources, overexploitation of resources and importance for environment: 2.2 Renewable and Non-renewable resources 2.3 Forest Resources 2.4 Water Resources 2.5 Mineral Resource 2.6 Food Resources
Unit-III **Ecosystems**	3a. Define Ecosystem 3b. List functions of ecosystem 3c. Describe major ecosystem in world	3.1 Concept of Ecosystem 3.2 Structure and functions of ecosystem 3.3 Major ecosystems in the world
Unit-IV **Biodiversity and its Conservation**	4a. Define biodiversity 4b. State levels of biodiversity 4c. Suggest measurers for conservation of biodiversity	4.1 Definition of Biodiversity 4.2 Levels of biodiversity 4.3 Threats to biodiversity 4.4 Conservation of biodiversity

Unit-V
 	
Environmental Pollution
	5a. Classify different types of pollution
	5b. Enlist sources of pollution
	5c. State effect of pollution
	5d. Identify measures for prevention of pollution
		5.1 Definition, Classification, sources, effects and prevention of
		  • Air pollution
		  • Water Pollution
		  • Soil Pollution
		  • Noise Pollution
		5.2 E- waste management

Unit-VI **Social Issues and Environment**	6a. Describe methods of water management 6b. Identify effects of Climate Change, Global warming, Acid rain and Ozone Layer 6c. Explain Concept of Carbon Credits	6.1 Concept of sustainable development 6.2 Water conservation, Watershed management. Rain water harvesting: Definition, Methods and Benefits. 6.3 Climate Change, Global warming, Acid rain, Ozone Layer Depletion, 6.4 Concept of Carbon Credits and its advantages

Unit-VII
 	
Environmental Protection
	7a. State important provisions of acts related to environment	7.1 Importance of the following acts and their provisions:
		  • Environmental Protection Act
		  • Air (Prevention and Control of Pollution) Act
		  • Water (Prevention and Control of Pollution) Act
		  • Wildlife Protection Act
		  • Forest Conservation Act
		  • Population Growth: Aspects, importance and effect on environment
		  • Human Health and Human Rights

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
		• ISO 14000

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* **Programme Outcomes/Course Outcomes in affective domain** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

SR. No.	Unit No.	Practical Exercises	Approx. Hrs. required
1	I	Report on Importance and public awareness of Environmental Studies.	04
2	II	Report on Use of natural resources and overexploitation of Resources	04
3	II	Visit /Video Demonstration to Renewable / Non-renewable (wind mill, hydropower station, thermal power station)/ resources of energy.	04
4	II	Visit to polyhouse and writing report on its Effects on agriculture food production.	04
5	III	Assignment/Report on structure and functions of ecosystem.	04
6	IV	Visit to a local area to environmental assets such as river / forest / grassland / hill / mountain and writing report on it.	04
7	V	Group discussion on Environmental Pollution (Air pollution/Water pollution/Soil pollution/Noise pollution/E-waste)	04
8	V	Visit to study recycling of plastic and writing a report on it.	04
9	VI	Visit to Water conservation site / Watershed management site / Rain water harvesting site and writing a report on it.	04
10	VI	Visit to study organic farming/Vermiculture/biogas plant and writing a report on it.	04
11	VI	Video Demonstration /Expert Lecture Report on Climate Change and Global warming	04
12	VII	Write important provisions of Acts related to Environment/ Air (Prevention and Control of Pollution) Act/Water (Prevention and Control of Pollution) Act/ Wildlife Protection Act/ Forest Conservation Act	04
		TOTAL	**32**

Note: Any Four Visits/ Video Demonstration and Four Reports/Assignments from above list to be conducted.

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Collect articles regarding Global Warming, Climate Change
2. Collect information regarding current techniques, materials etc. in environmental system.
3. Tree plantation and maintenance of trees in the Campus.
4. Cleanliness initiative (Swachhata Abhiayan)

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Course Video
2. Expert Lectures

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Environmental Studies	Erach Bharucha	Universities Press (India) Private Ltd, Hyderabad
2	Environmental Studies	Dr. Suresh K Dhameja	S K Kataria & Sons New Delhi
3	Basics of Environmental Studies	U K Khare	Tata McGraw Hill

B) Software/Learning Websites
Not Applicable

C) Major Equipments/ Instruments with Broad Specifications
Not Applicable

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	M			M	H					M
CO2	H	M			M	H					M
CO3	H	M	M		M	H			M		M
CO4	H	M		M	M	H		M		M	M
CO5	H	M			M	H					M
CO6	H	M			M	H	M				M
CO7	H	M			M	H					M
CO8	H	M			M	H					M

H: High Relationship, M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in ME / PS / EE / IF / CM / EL / AE / DD
COURSE : Industrial Organization and Management(IOM)   **COURSE CODE :** 6303

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme						
Hrs / week			Credits	TH Paper Hrs.	Marks						
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	--	03	03	Max.	80	20	100	--	--	--	100
					Min.	32	--	40	--	--	--	--

1.0 RATIONALE:

Diploma engineer has to work in organization. One must know how organization works, structure of organization, departments & their roles in organization. One should be familiar with concept of organization & its importance in management.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Understand the concepts of organization.
2. Resolve the major challenges in the design of an effective organizational structure.
3. Develop critical thinking, research, oral and written communication skills.
4. Promote an understanding to create organizational values and satisfy their stakeholders.
5. Know the preventive measures for accidents and safety.
6. Apply the various tools for scientific management.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Identify the organization and its types with ownerships.
2. State the principles of management with different levels.
3. Describe the types of accidents and its measures.
4. Work as a production supervisor and store officer.
5. Co-ordinate the functions of HRM and Marketing departments.
6. Use the practices of CPM/PERT and Supply Chain Management.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Organization and Ownerships**	1a. Describe organization and its types 1b. State various types of ownership firms	**a. Organization** 1.1 Concept of organization 1.2 Types of organization structures as line, line and staff, functional organizational structures, their merits and demerits. **b. Ownerships** 1.3 Proprietorship 1.4 Partnership, Types of partners, Partnership deed. 1.5 Joint stock companies, Private Limited, Public Limited, Joint Ventures. 1.6 Govt. departments, Govt. undertaking, Public corporation	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		1.7 Cooperative Organizations	
		1.8 Merits & demerits of all above mentioned types of ownership.	
Unit-II **Scientific Management**	2a. Explain functions of scientific management 2b. State the principles of management. 2c. Describe different levels of management.	2.1 Concept and importance of scientific management. 2.2 Principles of Management, Taylor, Fayol's Theories of management. 2.3 Functions of Management, Levels of Management and skills at different levels	06
Unit-III **Industrial Developments in India and Industrial Acts**	3a. Explain the major areas of Indian industries 3b. Describe types of accidents & safety measures 3c. State provisions of industrial acts.	**a. Industrial Developments in India** 3.1 Major areas of industry in India (Automobile, Cement, Steel and Agro industries) 3.2 Introduction of WTO and GATT **b. Industrial Acts** 3.3 Safety Management • Causes of accidents • Types of Industrial Accidents • Preventive measures • Safety procedures 3.4 Industrial Legislation - Necessity of Acts, Provisions of following acts: • Indian Factory Act • Workman Compensation Act • · Minimum Wages Act	08
Unit-IV **Production and Material Management**	4a. Explain the types of production systems 4b. Describe the material management techniques 4c. State use of ERP and MRP	**a. Production Management** 4.1 Concept of production management 4.2 Types of production systems – job, batch and mass 4.3 Merits and demerits of all above production systems **b. Material Management** 4.4 Inventory Concept, its classification, functions of inventory 4.5 ABC Analysis - Necessity & Steps 4.6 Economic Order Quantity Concept, graphical representation, determination of EOQ 4.7 Standard steps in Purchasing 4.8 Modern Techniques of Material Management- JIT, KANBAN, VSM, LEAN. 4.9 Material Resource Planning (MRP) - Functions of MRP, Input to MRP, Benefits of MRP 4.10 Enterprise Resource Planning (ERP) - Concept, advantages & disadvantages of ERP	10
Unit-V **Marketing**	5a. Explain the functions of marketing management	**a. Marketing Management** 5.1 Concept of marketing management and importance	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
and Human Resource Management	5b. Describe selection procedure by HRM dept. 5c. Importance of Employee training	5.2 Functions of marketing promotion of sales, market segmentation, marketing mix, 4P's and Physical distribution. **b. Human Resource Management** 5.3 Recruitment selection procedure, Functions of HRM Dept. 5.4 Training of human resources- objectives, importance and methods of training	
Unit-VI **CPM/PERT and Supply Chain Management**	6a. Explain the importance of CPM/PERT 6b. Describe the need of SCM in industry	**a. CPM/PERT** 6.1 CPM & PERT – definitions of node, activity, dummy activity, resources, duration, network, earliest start time, earliest finish time, latest start time, latest finish time, float. 6.2 Drawing of network and determination of critical path. 6.3 Analysis of network. **b. Supply Chain Management** 6.4 Definition and Concept of SCM 6.5 SCM practices- Relational, Vendor Managed Inventory (VMI), Agile Manufacturing and Postponement. 6.6 Green SCM 6.7 Concept of cross docking 6.8 Case study of Wall Mart and Dell Computer	08
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title		Distribution of Theory Marks			
			R Level	U Level	A and above Levels	Total Marks
I	a.	Organization	--	04	--	04
	b.	Ownerships	02	04	--	06
II	a.	Scientific Management	02	04	02	08
III	a.	Industrial Developments in India	02	04	--	06
	b.	Industrial Acts	04	04	--	08
IV	a.	Production Management	02	04	02	08
	b.	Material Management	02	04	02	08
V	a.	Marketing Management	--	08	--	08
	b.	Human Resource Management	02	06	--	08
VI	a.	CPM/PERT	02	02	04	08
	b.	Supply Chain Management	02	02	04	08
	TOTAL		**20**	**46**	**14**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

Not Applicable

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Collect the organization structures of manufacturing, cement, pharmacy, electrical, govt. Sectors.
2. Find out the information of above mentioned industries by internet.
3. Collect the rules of industrial acts by ILO websites.
4. Gather information about chain structures of material management by logistics' industries.
5. Collect the information about WTO and GATT by online resources.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (IF ANY):
1. Show organization structures of different industries, govt. sectors, private firms etc.
2. Arrange a visit to industries, govt. offices located at nearby areas.
3. Arrange expert seminar/lectures by a resource person from industry in the area of manufacturing, HRM, Logistics etc.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Industrial Engineering & Management	Dr. O. P. Khanna	Dhanpat Rai & Sons New Delhi
2	Industrial Engineering & Management	Banga & Sharma	Khanna Publication
3	Business Administration & Management	Dr. S. C. Saksena	Sahitya Bhavan Agra
4	The process of Management	W. H. Newman E. Kirby Warren Andrew R. McGill	Prentice- Hall
5	Entrepreneurship Development & Management	Dr. R. K. Singal	S. K. Kataria & Sons, New Delhi
6	Production Planning & Control	Dr. R. K. Singal	S. K. Kataria & Sons, New Delhi

B) Software/Learning Websites
1. http://www.wto.org/
2. http://www.gatt.org/
3. http://www.worldtradelaw.net/
4. http://www.supplychainbrain.com/
5. http://www.legallyindia.com/

C) Major Equipments/ Instruments with Broad Specifications

Not Applicable

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
CO1				M							
CO2					L		M				
CO3		M					L				
CO4	L					H					
CO5				L							L
CO6							M				

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE
COURSE : Supervisory Skills (SSL)   **COURSE CODE :** 6305

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	--	03	03	Max.	80	20	100	--	--	--	100
					Min.	32	--	40	--	--	--	--

1.0 RATIONALE:

A diploma engineer working in the industry has to co-ordinate and supervises a group of workers. An engineer should have a leadership attitude. This course will help to develop requisite traits in the diploma engineer.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Understand importance of scientific management.
2. Understand the controlling performance of process & people.
3. Know organizing, staffing and training of worker.
4. Understand the importance of leadership.
5. Know industrial psychology and human relation.
6. Know safety awareness and health administration in the industry.
7. Understand role of supervisor in industry.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Explain the importance of scientific management.
2. Describe controlling performance of process & team of worker.
3. Explain the methods to train the worker.
4. State the qualities of leader.
5. Describe progressive disciplinary action to worker.
6. Enlist causes of accident and prevention of accident.
7. Explain the role of supervisor towards management and worker.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Scientific Management and Management of Job**	1a. Define the term management. 1b. Differentiate between management, administration and organisation. 1c. Explain the necessity and steps of scientific management. 1d. Describe handling complexity and its steps.	1.1 Management-definition, its job, Difference between management, administration and organization. Levels and its functions of management. 1.2 Definition, Necessity and, procedure of scientific management 1.3 Handling complexity and its steps. 1.4 Optimization and its steps.	06

118

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-II **Supervisory Management**	2a. Explain objective of planning by supervisory 2b. Describe the different types of budget. 2c. Explain the controlling of performance of team of worker in term of quantity & cost.	2.1 Planning by supervisor, necessity, steps and objectives 2.2 Budgeting at supervisory level, objective and its advantages. Types of budget. 2.3 Deciding mental & physical activities of workers. 2.4 Controlling the performance of process & team of worker in term of quantity / quality/ time/ cost.	06
Unit-III **Organising, Staffing and Training.**	3a. Define organising. 3b. State physical resources needed for production. 3c. Explain staffing with human resources. 3d. Define Merit rating. 3e. Explain methods of merit rating. 3f. Describe needs & objectives of training. 3g. List types of training. 3h. Explain types of training.	3.1 Organizing effectively the department, provision of physical resources, matching human need with job need, allotment of to individual and establishing relationship among person working in a group. 3.2 Staffing with the human Resources. 3.3 Appraisal of Employee performance or merit rating and its types. 3.4 Training-definition, needs and objectives its types –induction and orientation, by skill & old worker, on job training, apprentice training, by special schools.	06
Unit-IV **Activating the Work Force**	4a. Define-Motivation. 4b. Explain the motivating factors. 4c. State qualities of leader. 4d. Explain democratic leadership. 4e. Explain need of effective communication.	4.1 Motivation –definition, types and motivating factors. 4.2 Leadership-definition, qualities of leader, Role of leadership, methods- authoritarian, democratic and lassez- faire or free rein. 4.3 Effective employee communication.	08
Unit-V **Managing Problem Performance**	5a. State symptoms of troubled employee. 5b. Explain causes of industrial dispute. 5c. Describe collective bargaining. 5d. State the causes of substandard performance. 5e. Explain progressive disciplinary action.	5.1 Counselling troubled employees- symptoms, need and guidelines for counselling. 5.2 Industrial dispute-causes, strikes, settlement of industrial dispute, collective bargaining, conciliation & mediation and arbitration. 5.3 Disciplining-definition, Substandard performance, progressive disciplinary action.	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-VI **Employee Health and Safety Under OSHA**	6a. Define accident. 6b. List causes of accident. 6c. Explain the effect of accident to industry, worker and society. 6d. Describe role of OSHA	6.1 Accident-definition, Causes of accident, Prevention of accident, effect of accident to industry, worker and society, Preparation of accident report and investigation. 6.2 Occupational diseases, hazards, safety awareness. 6.3 Role of OSHA. (Occupational safety & health administration), industrial health.	06
Unit-VII **Supervisor's Role in Labour Relation.**	7a. Explain role of supervisor towards management and work. 7b. Describe function of labour union.	7.1 Role of supervisor in management/ worker/fellow Supervisor/work. 7.2 Labour or trade union-function, right and liabilities.	04
Unit-VIII **Moving Up in Your Organisation**	8a. Explain activities to be done at end of shift by supervisor. 8b. Describe sort of attitude and action by supervisor while moving up in organization.	8.1 Taking charge of career to know organization, Department & Worker etc. Planning the day work, activities to be done before shift start, beginning, during and end of shift. 8.2 Moving up –sort of attitude and action by supervisor	06
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Scientific Management and Management of Job	04	04	04	12
II	Supervisory Management	04	04	04	12
III	Organizing, staffing and Training.	04	06	--	10
IV	Activating the work force.	06	04	--	10
V	Managing problem performance.	04	04	04	12
VI	Employee Health and safety under OSHA	04	02	04	10
VII	Supervisor's role in Labour Relation.	--	06	-	06
VIII	Moving up in your organisation.	04	04	--	08
	TOTAL	**30**	**34**	**16**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:
Not Applicable

1.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Prepare safety charts and slogan.
2. Exhibition of safety charts and slogan.

2.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Show video clips on management and motivation.
2. Arrange expert lecture of industry person in the area of safety awareness in industry.
3. Show video clip on safety in industry.

3.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Industrial Engineering and management	O. P. Khanna	Dhanpat Rai & Sons
2	Industrial organization & Engineering Economics	Banga & Sharma	Khanna Publication
3	Industrial management	Shrinivasan	Dhanpat Rai & Sons

B) Software/Learning Websites
1. http://www.management.com
2. www.safety.com

C) Major Equipments/ Instruments with Broad Specifications
Not Applicable

4.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	M			H					M		M
CO2			H	M			L	M	M		
CO3		M	H	M			M		M		M
CO4	H		M			H			M		M
CO5		M			M		M		M		
CO6		M			M		M		M		M
CO7				M	M	M	M	M	M		

H: High Relationship, M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE
COURSE : Marketing Management (MKM)   **COURSE CODE :** 6306

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	--	03	03	Max.	80	20	100	--	--	--	100
					Min.	32	--	40	--	--	--	--

1.0 RATIONALE:

The Marketing of product is the most important aspect of each industry. It needs to be systematically surveyed and planned as in the increasing competitive situation. An organization should have a profit for its existence. An engineer as entrepreneur, marketing set up of a company should have knowledge of marketing management. The job opportunities for an engineer in the marketing are increasing due to essentiality of person to deal the technical matter and give related feedback for improvement of product marketing function.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Understand various elements of market survey and design its methodology.
2. Understand the duties of marketing personal.
3. Learn the concept of pricing, branding, product mix etc.
4. Understand various marketing strategies.
5. Study various sales Forecasting methods and product diversification.
6. Acquire knowledge of various tools/techniques of Market research and product promotion.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Assess market opportunities by analyzing customers, competitors, collaborators, considering strengths and weaknesses of a company.
2. Develop effective marketing strategies to achieve organizational objectives.
3. Design a strategy implementation program to maximize its chance of success.
4. Assess scope for international marketing.
5. Use various tools/techniques of Market research and product promotion.
6. Apply various innovative ideas of advertisement for enhancing the sales.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Marketing Management Concept**	1a. Explain the needs, wants and demands of customers. 1b. Describe the concept of marketing management.	1.1 Needs, wants and Demands, Types of market demands, Products (Goods, services and Ideas), cost and satisfaction.	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	1c. Explain the functions of marketing management. 1d. Differentiate between selling and marketing. 1e. Explain the techniques of maximizing, consumption, customer choice and satisfaction. 1f. Distinguish between macro and micro environment. 1g. Explain techniques of maximizing consumer satisfaction, choice, product life etc.	1.2 Markets, Marketers and prospects, primary purpose of marketing management. 1.3 Simple marketing system, value exchange and transaction, functions of marketing. 1.4 The product, production and selling concept. 1.5 The marketing concept, difference between marketing and selling, the social marketing concept. 1.6 Maximize consumption, satisfaction, choice, product life, quality, customer value and consumer satisfaction, Customer – delight, life time customer. 1.7 Marketing environment – value, macro and micro environment.	
Unit-II **Marketing Management Process**	2a. Explain various types of market segmentation. 2b. Explain product life cycle. 2c. Describe 4P's of marketing. 2d. Explain the significance of different techniques in product promotion. 2e. Differentiate between Direct and Indirect marketing.	2.1 Market segmentation: Basis for segmentation- Geographic / Demographic / psychographic segmentations, benefits of Market segmentation. 2.2 Product: Concept of Product, New product development process. 2.3 Product Life cycle, Stages in PLC and Marketing Strategies. 2.4 Marketing mix: 4 P's, significance of 4P's. 2.5 Methods of marketing- Direct and Mass marketing. 2.6 Product promotion- Role of advertisement, personnel selling and internet in marketing promotion, mail marketing.	08
Unit-III **Price Decisions**	3a. Explain the significance of pricing in marketing management. 3b. Describe the different pricing methodologies.	3.1 Importance of pricing, price setting in practice 3.2 Cost oriented pricing- mark-up pricing, target pricing. 3.3 Demand oriented pricing, price discrimination. 3.4 Competition oriented pricing- going rate pricing, sealed bid pricing.	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-IV **Marketing Research**	4a. Explain the concept, scope, objectives, importance and limitation of market research. 4b. Explain various methods of data collection. 4c. Describe the market research tools and techniques. 4d. Differentiate between primary data and secondary data.	4.1 Market research – Introduction, Nature, Scope, objective, importance, limitations and issue formulation. 4.2 Source and collection of marketing data- primary data, secondary data. 4.3 Methods of collection of primary data- observation, mail, personal interview, television etc. 4.4 Market Research Techniques- National Readership survey, consumer panel, test marketing.	08
Unit-V **Advertising and Sales Management**	5a. Explain the concepts of marketing communication. 5b. Explain the different types of sales promotions. 5c. Describe the concepts of sales management. 5d. Describe the various types of advertising media.	5.1 Concept and the process of marketing communication. 5.2 Concept of Sales promotion and its types. 5.3 Advertising media – objectives and functions, Types of media, advertising budget, functions of advertising agency. 5.4 Sales management: Concept, objectives, sales forecasting. 5.5 Personnel selling- concept, salesmanship, qualities of salesman.	08
Unit-VI **Strategic Marketing**	6a. Describe the concepts of strategic marketing management. 6b. Explain the concept of Strategic marketing	6.1 Objectives and concept of strategic marketing management, 6.2 Strategic marketing Analysis-SWOT Analysis, BCG Matrix.	04
Unit-VII **International and Export Marketing**	7a. Explain the concept, scope, opportunities and challenges of international marketing. 7b. Describe the Multi-National Enterprises with examples. 7c. Explain the role of Indian Trade Promotion Organization. 7d. State and explain the benefits to exporters.	7.1 Concept, scope, challenges and opportunities in international marketing. 7.2 Foreign market entry strategies. 7.3 Concept of Multi-National Enterprises (MNE) with examples. 7.4 Institutional support from government to promote export. 7.5 Role of I.T.P.O. (Indian Trade Promotion Organization) 7.6 Benefits offered to exporters by Central government.	04
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Marketing Management concept	06	08	--	14
II	Marketing Management Process	04	08	04	16
III	Price Decisions	04	04	--	08
IV	Marketing Research	04	04	04	12
V	Advertising and sales management	04	08	04	16
VI	Strategic marketing	02	04	--	06
VII	International marketing – Export	02	02	04	08
	TOTAL	**26**	**38**	**16**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:
Not Applicable

7.0 STUDENT ACTIVITIES:
Following is the list of proposed student activities like
1. Group discussion on Brand Strategies of any one company.
2. Assignment / Report writing on:
   (a) Distribution strategy of any one company.
   (b) Promotional tools (communication mix) adopted by any one company.
   (c) Comparative advertising strategies of any two companies.
   (d) Sales promotions offered by FMCG companies/brands (Minimum two companies/brands).

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
Not applicable

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title	Author	Publication
1	Introduction to Marketing science	Lal G. K.	Pearson edition international
2	Marketing	Dale Timge	Prentice hall
3	Marketing Engineering.	Lillen Gary	Pearson edition international
4	Marketing Management	Phillip Kolter	Pearson edition international
5	Modern Marketing Management	Francis G. K.	S. Chand & Company
6	Advertising Marketing Sales Management	Thakur D.	D&D Publication
7	Marketing Management	Mr. S. A. Sherlekar	Everest Publications.
8	How to Export	NABHI	NABHI Publication

B) Software/Learning Websites
1. http://www.business-standard.com/
2. http://studymarketing.org/
3. http://salesandmarketing.com/

C) Major Equipments/ Instruments with Broad Specifications
Not Applicable

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1				L			M	H	M	L	
CO2					H			H	H	H	
CO3			M	M	M		M	M	L		
CO4					M		H	L	M		
CO5					L		L	M	M	M	H
CO6			L	M	M	M	L	H	H	H	L

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE / DD / ID
COURSE : Entrepreneurship Development (EDP)   **COURSE CODE :** 6309

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme				Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks						
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
01	--	02	03	--	Max.	--	--	--	--	--	50	50
					Min.	--	--	--	--	--	20	--

1.0 RATIONALE:

Globalization, liberalization & privatization along with revolution in Information Technology, have thrown up new opportunities that are transforming lives of the masses. On the global scenario we have abundant physical and human resources which emphasizes the importance and need of entrepreneurship. Talented and enterprising personalities are exploring such opportunities & translating opportunities into business ventures such as- BPO, Contract Manufacturing, Trading, Service sectors etc. The student community also needs to explore the emerging opportunities. It is therefore necessary to inculcate the entrepreneurial values during their educational tenure. This will help the younger generation in changing their attitude and take the challenging growth oriented tasks instead of waiting for white- collar jobs. This course will help in developing the awareness and interest in entrepreneurship and create employment for others.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Identify entrepreneurial opportunity.
2. Develop entrepreneurial personality, skills, values and attitude.
3. Analyze business ideas- project selection.
4. Develop awareness about enterprise management.
5. Take help of support systems like banks, Government, DIC etc.
6. Prepare preliminary project report.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Develop Entrepreneurial skill by brainstorming games, SWOT analysis, Risk taking games
2. Collect information by Visiting to DIC and Nationalised Banks
3. Interview of successful entrepreneur
4. Learn the success stories from successful entrepreneur.
5. Select product after market survey for product comparison, specifications and feasibility study
6. Prepare preliminary project report

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Entrepreneurship, Creativity and Opportunities**	1a. Conduct self analysis 1b. Overview of Entrepreneurship 1c. Generating business idea	1.1 Concept, Classification & Characteristics of an Entrepreneur 1.2 Creativity and Risk taking. 1.3 Concept of Creativity, brainstorming Risk Situation, Types of risk & risk takers.	04

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	1d. Search business opportunities	1.4 Trade Related opportunities 1.5 Business Idea -Methods and techniques to generate business idea. 1.6 Transforming Ideas in to opportunities 1.7 SWOT Analysis 1.8 Scanning Business Environment	
Unit-II **Business Terminology, Information and Support Systems**	2a. Understand Classification of business sectors 2b. Acquiring help from support systems 2c. Planning of business activities	2.1 Types of business and industries, forms of ownership, Franchisee, Export, Network/Multilevel Marketing 2.2 Sources of Information. Information related to project, support system, procedures and formalities 2.3 Support Systems • Small Scale Business Planning, Requirements. • Statutory Requirements and Agencies. • Taxes and Acts	02
Unit-III **Market Assessment**	3a. Conducting Market survey 3b. Selection of product	3.1 Marketing - Concept and Importance 3.2 Market Identification, Survey Key components 3.3 Market Assessment	02
Unit-IV **Business Finance**	4a. Understanding terminology of finance 4b. Search and analyse sources of finance 4c. Financial ratio and profitability study	4.1 Cost of Project 4.2 Sources of Finance 4.3 Assessment of working capital 4.4 Product costing 4.5 Profitability 4.6 Break Even Analysis 4.7 Financial Ratios and Significance 4.8 Various govt. /bank schemes of finance (long term and short term)	04
Unit-V **Business Plan and Project Appraisal**	5a. Prepare a project report 5b. Conduct feasibility study	5.1 Preliminary project report preparation. 5.2 Project Appraisal & Selection Techniques • Meaning and definition • Technical, Economic feasibility • Cost benefit Analysis • Checklist	04
		TOTAL	**16**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):
Not Applicable

6.0 ASSIGNMENTS/PRACTICALS/TASKS:
The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if*

these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hours
1	I	Entrepreneurship Awareness- Who am I?/ EOI/ Microlab Exercise	04
2	I	Creativity Exercises/games	02
3	I	Risk taking Exercises/games	02
4	II	Brainstorming/group discussion/problem solving exercises	04
5	III	Business Games and Related Exercises	04
6	II	Interview of an entrepreneur	02
7	IV	Event/task/activity management-group of 4-6 students will work together	04
		AND/OR	
1 to 7	I-IV	3 day Achievement Motivation Training workshop /Entrepreneurship Awareness Program	22
8	V	Visit to DIC/Bank/MSSIDC/MIDC/MPCB/Industry	04
9	V	Prepare a preliminary project report and study its feasibility	06
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Assess yourself – are you an entrepreneur? (Self Analysis)
2. Report on
    - interview of successful entrepreneurs (minimum two)
    - interaction with the support systems
    - visit to small scale industry
3. Product survey - select one product and collect all its related information i.e. specification, price, manufacturer from at least three suppliers/ manufacturers
4. Prepare list of identified opportunities

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Conduct 3 days awareness camp for entrepreneurship by professional bodies
2. Arrange a visit to SSI/DIC
3. Arrange Interview / Expert lecture of an entrepreneur

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Entrepreneurship Development	E. Gorden, K. Natrajan	Himalaya Publishing, Mumbai
2	Entrepreneurship Development	Colombo plan staff college	Tata McGraw Hill Publishing Co. Ltd. New Delhi.
3	A Manual on How to Prepare a Project Report	J. B. Patel D. G. Allampally	EDI STUDY MATERIAL Ahmadabad
4	A Manual on Business Opportunity Identification & Selection	J. B. Patel S. S. Modi	
5	National Directory of Entrepreneur Motivator & Resource Persons.	S. B. Sareen H. Anil Kumar	
6	A Handbook of New Entrepreneurs	P. C. Jain	

Sr.No.	Title of Book	Author	Publication
7	The Seven Business Crisis & How to Beat Them.	V. G. Patel	
8	Entrepreneurship Development of Small Business Enterprises	Poornima M. Charantimath	Pearson Education, New Delhi
9	Entrepreneurship Development	Vasant Desai	Himalaya Publishing, Mumbai
10	Entrepreneurship Theory and Practice	J. S. Saini B. S. Rathore	Wheeler Publisher, New Delhi
11	Entrepreneurship Development	--	TTTI, Bhopal / Chandigarh
12	Entrepreneurship Management	Aruna Kaulgad	Vikas Publication

B) Software/Learning Websites
   Websites-
1. http://www.ediindia.ac.in
2. http://www.dcmsme.gov.in/
3. http://www.udyogaadhaar.gov.in
4. www.smallindustryindia.com
5. www.sidbi.com
6. www.tifac.org.in

C) Video Cassettes /CDs

Sr.No.	SUBJECT	SOURCE
1	Five success Stories of First Generation Entrepreneurs	EDI STUDY MATERIAL Ahmadabad (Near Village Bhat, Via Ahmadabad Airport & Indira Bridge), P.O. Bhat 382428, Gujarat, India P.H. (079) 3969163, 3969153 E-mail: ediindia@sancharnet.in olpe@ediindia.org Website: http://www.ediindia.org
2	Assessing Entrepreneurial Competencies	
3	Business Opportunity Selection and Guidance	
4	Planning for completion & Growth	
5	Problem solving-An Entrepreneur skill	
6	Chhoo Lenge Aasman	
7	Creativity	

D) Major Equipments/ Instruments with Broad Specifications
   Not applicable

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1			L				L	M			M
CO2					M		M	H	M	M	H
CO3					L		M	L	H	L	M
CO4					L	M	M	M	M	H	M
CO5					H	M	M	H	H	M	M
CO6	L	M	M	M	M	M	H	H	M	H	H

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)

COURSE : E-Commerce (ECM)   **COURSE CODE** : 6315

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
01	--	02	03	--	Max.	--	--	--	--	--	50	50
					Min.	--	--	--	--	--	20	--

1.0 RATIONALE:

Globalization along with revolution in information technology has thrown up new opportunities that are transforming the lives of masses. Recent years saw a rapid growth of internet in various domains which includes e-commerce primarily. The basic aim of this course is to introduce e-commerce framework with its infrastructure, models, payment systems and e-commerce categories to the students. They should be familiar with the concepts of e-commerce and its importance in running a successful business.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Describe e-commerce and its success factors.
2. Recognize different models of e-commerce and applications of each model.
3. Identify different computing resources required to establish e-commerce infrastructure.
4. Enumerate use of m-commerce in different areas of business.
5. Identify and examine different categories of e-commerce.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Explain basic concepts and framework of e-commerce.
2. Compare different business models of e-commerce.
3. Configure and implement e-commerce infrastructure using different computing resources.
4. Describe online payment systems and applications of m-commerce.
5. Introduce and define scope of different categories of e-commerce.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction to e-Commerce**	1a. Knowledge about basic concepts of e-commerce environment 1b. Introduction to e-commerce framework and its conceptual view 1c. Explain different critical success factors of e-commerce	1.1 Introduction: Internet, WWW, Website, Web Application, Advantages and Disadvantages. 1.2 e-Commerce: Definition, History of e-commerce, e-commerce framework, conceptual view, Critical Success Factors: Transaction Security, Reliability, Speed, Brand Awareness, Traffic Volumes, Community, Network Security, Cryptography, Costs etc.	04
Unit-II **E-Commerce Business Models and Infrastructure**	2a. Describe and compare different business models of e-commerce 2b. Identify and configure resources to implement e-commerce infrastructure	2.1 Business model: B2B model, B2C model, C2C model, Advantages and Disadvantages of each model. 2.2 E-Commerce Infrastructure: Hardware, Software, Server, Applications, Networking, Data Storage etc.	04
Unit-III **Electronic Payment Systems and m-Commerce**	3a. Describe electronic payment system 3b. Uses and applications of m-commerce	3.1 Electronic Payment System: Credit/Debit Cards, Smart Cards, PayPal, e-Billing, e-Micropayments. 3.2 M-Commerce: Overview of mobile-Commerce attributes of m-Commerce, Applications of m-Commerce: Mobile Financial Applications, m-wallet, Mobile Shopping, Advertising.	04
Unit-IV **Categories of e-Commerce**	4a. Introduction to different categories of e-commerce 4b. Introduction to online shopping and its scope in India	4.1 E-Learning: Definition, Introduction, Types of e-Learning. 4.2 E-Marketing: Definition, Introduction, Scope, Internet Marketing Techniques. 4.3 E-shopping: Introduction, history, advantages and disadvantages, security tips for, online shopping, introduction to big online shopping sites in India.	04
		TOTAL	**16**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme

Outcomes/Course Outcomes related to affective domain.

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I	Study assignment on e-commerce framework and its conceptual view	02
2	II	Study assignment on different business models of e-commerce and compare each model	02
3	II	Draw and describe different devices required to set up an e-commerce infrastructure (any 5 devices)	02
4	III	Describe each step of online payment process using credit/debit card along with screenshots	04
5	III	Describe each step of online payment process using internet banking along with screenshots	04
6	III	Prepare a simple case study on different payment gateways and third parties of online payment service providers	04
7	III	Describe process of mobile shopping using any one online shopping app along with screenshots	04
8	IV	Study assignment on different types of e-learning methodologies	02
9	IV	Prepare a simple survey of internet marketing techniques used in India	04
10	IV	Describe process of online shopping along with screenshots using any one online shopping site	04
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Identify different latest online tools, equipments, websites and mobile apps in a market in concern with E-Commerce and prepare a list of it along with its uses.
2. Troubleshooting of hardware and networking devices
3. Perform online payments using credit/debit cards or internet banking
4. Perform a simple survey about online learning web sites in India

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show online shopping to students
2. Show online payment process to students
3. Arrange expert lecture or seminar of industry person in the area of online shopping, marketing, learning and it's challenges

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1.	The E-Commerce Book, 2nd Edition: Building the E-Empire	Stefano Korper, Juanita Ellis	Morgan Kaufmann
2.	The Complete E-Commerce Book: Design, Build & Maintain a Successful Web-based Business	Janice Reynolds	CRC Press
3.	E-Commerce Essentials	Laudon & Traver	Prentice Hall India
4.	E-Commerce Basics: Technology Foundations and E-Business Applications	Davis & Benamati	Prentice Hall India
5.	E-Commerce	Milind Oka	Everest Publishing House

B) Software/Learning Websites

1. http://en.wikipedia.org/wiki/E-commerce
2. http://cyber.law.harvard.edu/olds/ecommerce/introduction.html
3. http://ccm.net/contents/207-introduction-to-e-commerce-electronic commerce
4. http://www.indianmba.com/Faculty_Column/FC545/fc545.html
5. http://kaiserthesage.com/seo-strategies-resources/

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments/ Instruments	Specifications
1.	Desktop Computer	Processor: PIV or above HDD: 40GB Min, RAM: 2GB or above OS: 32 bit or 64 bit
2.	Internet	256 Kbps minimum
3.	Networking Devices	Switches, Routers, Server etc

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	H									L
CO2			H		M		L				
CO3		H	H	H				M		L	
CO4		H			L					M	
CO5	H					M			H		

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME **:** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE **:** Professional Practices (PPR) **COURSE CODE :** 6410

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme				TH Paper Hrs.	Examination Scheme							
Hrs / week			Credits			Marks						
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
--	--	04	04	--	Max.	--	--	--	--	--	50	50
					Min.	--	--	--	--	--	20	--

1.0 RATIONALE:

Most of the diploma holders join industries. Due to globalization and completion in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests. While selecting candidates a normal practice adopted is to see general confidence. Attitude and ability to communicate and attitude in addition to basic technological concepts.

The purpose of introducing professional practice is to provide opportunity to students to undergo activities which will enable them to develop confidence. Information search Industrial visits, expert lectures and case study will increase participation of students in learning process.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Understand techniques of data collection.
2. Study professional techniques through industrial visits and expert lectures.
3. Understand and find solutions for technical problems.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Collect technical information from different sources.
2. Write industrial visit reports.
3. Acquire technical knowledge through expert lecture.
4. Develop problem solving techniques through case studies.

4.0 COURSE DETAILS:

Note: There are no separate classes for theory as given below. The relevant theory has to be discussed before the practical during the practical sessions.

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit-I **Information search and data collection**	1a. Collect information from internet / newspaper / periodicals / magazines etc. Groups (4 to 5 students) have to search/collect information about any one of the given topic. 1b. Students will have to submit a report of about 8-10 pages.	1.1 Manufacturing and costing of Computer hardware and software. 1.2 Advances in software Technology. 1.3 Information search related to IT Companies (Working Environment) 1.4 Information search related to Hardware & Networking Companies (Products and Features) 1.5 E-Business. 1.6 Making a business plan. 1.7 Information about Legendary Personalities through suitable websites (e.g. YouTube). Human machine interface 1.8 Dynamic languages 1.9 Robotic surgery 1.10 Virtual keyboard 1.11 Wireless USB 1.12 Concept of cloud computing 1.13 Bubble sensing 1.14 Blu – ray disc Or 1.15 any other suitable topic
Unit-II **Industrial visit.**	2a. Develop technical report writing skills on industrial visits	2.1 Industrial visits and report writing of • Visit any Small scale/Large Scale Software Company • Visit any BPO/KPO industry • Visit any Software Development or Consulting firm/Center/industry
Unit-III **Expert Lectures**	3a. Lectures by Professional / industrial Expert to be organized from the following areas (any one)	3.1 Project presentation tips. 3.2 Spoken English. 3.3 Personality development. 3.4 Current trends in IT. 3.5 How to develop positive thinking. 3.6 Advanced technical writing skill 3.7 SAP modules and career. 3.8 Career trends in computer / IT field 3.9 Intelligent computer system. 3.10 Advanced trends in hardware technology. 3.11 Advanced programming languages in IT field. 3.12 Introduction to Apprenticeship Training Scheme
Unit-IV **Case Study**	4a. Understand / Solve Computer Engineering problems by case study technique.	4.1 Problem solving/ understanding through Case Study technique. (Any Two) • Data Mining Process and Applications • Big Data and its applications • Information Retrieval and Processing • Prepare a group of four students and study a specific topic from computer science field

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I	**Information search, data collection and writing a report on the topic (Any Three.)** a. Collection of Manufacturing and costing of Computer hardware and software. b. Information search related to Hardware & Networking Companies. c. Collect information about E-business. d. Market survey on IT Companies. e. Collect information about Robotics. f. A group of four students is expected to Collect 4 to 6 advertises showing job opportunities for C++, RDBMS, Java, VB, .NET, hardware engineer etc. from newspaper and online resources as well as personally visiting the relevant industries and offices.	24
2	II	**Industrial visits** a. A. Visit any one industry and find the knowledge and skills required for C++, RDBMS and Java Technologies. May also Visit related website. b. Visit any one IT companies and how its work.	16
3	III	**Expert Lectures (Any Two)** The lectures from professionals/ industry expert to be organized (2 hrs. duration) on any 2 topics of following suggested areas or any other suitable topics. a. Project presentation tips. b. Spoken English and Personality development. c. Current trends in IT. d. Advanced technical writing skill e. SAP modules and career. f. Career trends in computer / IT field.	08
4	IV	**Case study (Any Two)** a. Study of different types of Hardware and software. b. Case study on computer viruses. c. Case studies on training and development. d. Case studies on companies Act. e. Case studies on communication skills.	16
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Visit software industry in nearby places
2. Prepare Seminar on any latest trending topic in Computer/IT Field
3. Conduct Group Discussion on topic Suggested by Staff
4. Conduct a quiz competition on technical knowledge

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Show CAI computer software, arrange industrial visits, expert lectures, case studies related to computer engineering.

9.0 LEARNING RESOURCES:

A) National and international Journals and Magazine. New Building Construction, Inside Outside, Indian Concrete Journal, computer /IT Engineering.

B) Software/Learning Websites
1. http://www.mahapwd.com
2. www.Slideshow.com
3. www.icjonline.com

C) Major Equipments/ Instruments with Broad Specifications
   Not applicable

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1		H			H		H	H	H		M
CO2		H						M	H		M
CO3		H			M	M	M				M
CO4	H	H	H	H	M			M			H

H: High Relationship, M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Seminar (SEM)   **COURSE CODE :** 6411

TEACHING & EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.		Marks						
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
--	--	02	02	--	Max.	--	--	--	--	--	50	50
					Min.	--	--	--	--	--	20	--

1.0 RATIONALE:

An engineer or technician has to carry out variety of tasks & face problems and situations in his Professional life. He has to convey his ideas, communicate with people. Effective presentation of ideas, thoughts and information becomes a requisite skill for him.

The involvement of student in the seminar course will help him to plan and prepare the related topic by searching information from various sources, interact with others, analyze the information, document the content and present.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Develop abilities to search information
2. Suggest ideas through seminar
3. Collect data, information from various resources
4. Develop planning of seminar activities
5. Develop skill to communicate the problems and solutions
6. Develop skill to prepare reports
7. Develop presentation skills

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes as applicable to seminar:
1. Know and select seminar topic or problem statement in engineering field
2. Draft Problem statement or topic of seminar
3. Carry out literature survey from various resources
4. Write review of information search
5. Develop document preparation skills
6. Use of presentation skill for seminar delivery
7. Keep updated with latest trends in areas of engineering discipline

4.0 COURSE DETAILS:

Activity No	Activities
1	Briefing about selection for seminar topics in class: Discussion in class
2	Search seminar topics and approval of topic from guide from searched topics.
3	Collection of data and literature for seminar from: internet/ visit/Journals/Books/EBooks
4	Preparation of synopsis of seminar topic: print draft copy
5	Submission of seminar synopsis to guide (Printed copy)
6	Guidance about preparation of document by guide
7	Preparation of document by students
8	Editing document
9	Submission of Seminar and presentation document: Hard copy & Soft copy of power point
10	Submission of diary

Activity No	Activities
11	Seminar Presentation

The activities mentioned above shall be monitored and guided by the guide every week during the contact hours provided for the same.

5.0   AREAS FOR SELECTION OF SEMINAR:

Sr.No.	Areas For Selection
1	Green Technology
2	Advanced Application software's
3	Office Automation
4	Networking
5	Mobile Processing Technology
6	Latest Computerized controls
7	Automation
8	Computer Security
9	Cyber laws
10	Recent trends in Computer/Information Technology
11	Artificial Intelligence
12	Neural networks
13	Robotics
14	Parallel Computing, Super Computing
15	Antivirus software development

6.0   SUGGESTED INSTRUCTIONAL STRATEGIES:

Classroom Teaching, Library Assignment, Group Discussion, Case Studies

7.0   LEARNING RESOURCES:

Magazines, Journals, Papers: National & international Reference Books, Internet, Previous seminars, Text Books, Codes of Practices e. g. IS Codes, Video Cassettes, Audio Cassettes, Compact Discs, Charts, Transparencies, Software, Models, Industrial visits, expert lectures/workshops

8.0   GUIDELINES FOR SEMINAR:

1. **Selection of topic for seminar:**
   a. The student shall search from various resources and get the topic approved.
   b. Topic of seminar shall be based on curriculum with new developments.
   c. Topic of seminar should not be from the project taken by the group or by individual.
   d. Selection of topic should be finalised in consultation with teacher guide allotted for the seminar.

2. **Submission of Seminar Document:**
   a. The student shall get the seminar draft approved from Guide and complete final document.
   b. Each student shall prepare two hard copies of final seminar document and retain one copy with student and submit one hard copy along with soft copy for department.
   c. The structure of the seminar document shall be as per the following format: Certificate / Acknowledgement / Index / Introduction / Detailed content / Conclusion / References.
   d. The seminar report shall be of minimum 10 pages and max. 20 pages with 1.5 line spacing. Font: New Times Roman, left margin 3 cm, right margin 1.5 cm, top margin 2 cm, bottom margin 2 cm, header & footer 1.5 cm, page numbers, size of font 12

pt, paragraphs left and right justified. It should be certified by seminar Guide and Head of department.

3. **Evaluation of Seminar:**

Evaluation of seminar will consist of Progressive Assessment, Presentation

i. **Progressing Assessment:**
   1. Progressive assessment will be based on attendance, searching of various seminar topics, selection of title, collection of data from internet, Journals, Literatures, organization of data and preparation of document.
   2. The student has to get seminar document assessed from guide regularly.
   3. The attendance of the student shall carry 05 marks as follows
      a. Below 75 %   : 00 marks
      b. 75 % and below 80 % : 02 marks
      c. 80 % and below 85 % : 03 marks
      d. 85 % and below 90 % : 04 marks
      e. 90 % and above   : 05 marks

ii. **Presentation of Seminar:**
   1. The time for presentation shall be 7 to 10 minutes per student
   2. The question answer session time shall be 2 to 3 minutes per student
   3. Evaluation of presentation of seminar will be carried out by a panel of teaching staff from institute based on the following point
      a. Confidence and courage
      b. Technical knowledge acquired
      c. Presentation skill
      d. Use of presentation medium e.g. A/V aids, animation

iii. **Marking scheme for Seminar.**

Progressive assessment	Confidence and courage	Technical knowledge	Presentation skill	Use of media	Total
25	05	05	10	05	50

9.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1								H			
CO2								M		H	
CO3		H						M			
CO4			H		M					L	
CO5									H	M	
CO6											
CO7											H

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)

COURSE : Project (PRO) **COURSE CODE :** 6412

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.				Marks				
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
--	--	04	04	--	Max.	--	--	--	--	50	50*	100
					Min.	--	--	--	--	20	20	--

* Indicates TW to be assessed by external & internal examiners.

1.0 RATIONALE:

An Engineer or technician has to work on various projects in profession or field work. The aim of project is to develop the ability of "learning to learn' on its own, work in team. This would go a long way helping the students in keeping pace with future changes in technology and acquisition of Knowledge and skills as and when needed.

The scientific way of solving the problems and ability to apply it to find alternative solutions for the problems will help a technician in his professional life. This course will help to inculcate leadership skills, decision making, participative learning, resource management, cost considerations, documentation and report writing skills with effective communication.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Integrate the knowledge of engineering programme
2. Develop the skill to identify the problem & define the problem statement
3. Develop scientific attitude for stepwise solutions to the problems
4. Develop attitude to work in team and act as leader of project
5. Develop planning & execution skills
6. Build multidisciplinary concept with cost considerations
7. Understand recent developments in engineering fields and prepare report

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate some of course outcomes as applicable to project:
1. Participate effectively in group work
2. Collect, analyse and synthesise the data
3. Conduct a survey and investigate the activities
4. Make appropriate decision
5. Act as leader for group task
6. Develop cost consideration
7. Prepare technical reports

4.0 COURSE DETAILS:

Activity No	Activities
1	Formation of Group
2	Selection of Project: Individual/Group discussions
3	Define Problem statement for project work
5	Decide Strategies/Methodology to carry out project
6	Literature Survey/data survey
7	Submission of synopsis: by each group
8	Project activity plan-Defining activities, strategy, duration
9	Allocation of work responsibility to individual/team

Activity No	Activities
10	Visits to Industries / Institutions / Market/field work/sites
11	Collection of Data /Survey/Analysis
12	Design of Components, preparation of drawing, estimates wherever required, printed circuits design, its checking,
13	Fabrication, Assembling, Model/Prototype development, Testing as per project requirements
14	Progressive presentation of work and recording in diary
15	Consolidation of work allotted to individual or team
16	Presentation of initial draft: pre submission draft
17	Final Project Report: Printed: Submission: soft & Hard copy
18	Group presentation of project work at the time of final evaluation

The activities mentioned above shall be monitored and guided by Project Guide every week during the contact hours provided for the same.

The Project is also included with Seminar with the aim to develop certain set communication skills (preparation of report, writing survey report writing Lab. experiment results writing conclusions of the work done and physical phenomenon observed, participating in group discussions, verbally defending the project in the form of Seminar etc.)

5.0 AREA OF SELECTION FOR PROJECT

These are only guidelines; any project related to Information Technology depending upon the availability of projects may be included. Preference should be given to practical oriented projects according to the local needs.

Sr.No.	Areas For Selection
1.	Green Technology
2.	Advanced Application software's
3.	Office Automation
4.	Networking
5.	Mobile Processing
6.	Latest Computerized controls
7.	Automation
8.	Animation
9.	Database programming
10.	Accounting
11.	Game Development
12.	Inventory control system
13.	Designing software development for IT Application
14.	Electronic Data Processing
15.	Instrumentation based IT Application
16.	Interfacing of PC with Automated Devices.

6.0 GUIDELINES FOR PROJECT:

A. Group Formation:
1. The department Head / Officer in Charge shall make sure that the project groups are formed within **one week** of the beginning of academic term and assign a faculty as project guide.
2. The students may be asked to work in groups of five students. The group size may be varied in accordance with the effective compliance of project work.
3. The group can decide the leader and distribute work and prepare the group management structure.

B. Finalization of Project Title:
1. The students are expected to take up a project with the guidance of a Project Guide from the institute/Industry Expert/Sponsored by industry, Institute, society, self.
2. Industrial project shall be encouraged.
3. The students can seek help from TPO/ HOD/Guide.
4. The group of students/Project guide/authority shall see the viability/ feasibility of project over the duration available with the students and capabilities and setup available.

C. Note:
1. The group / student shall prepare Project Diary with Name of Project, Name of Students in group, their attendance and progress and get assessed from guide from time to time during project hours.
2. The title of the project should be finalized within **two weeks** after the group formation and a synopsis of the project should be submitted to the guide.
3. An abstract (synopsis) not exceeding 100 words, indicating salient features of the work shall be submitted to guide.
4. Modify format suitably as per requirement of the project.

D. Project Execution:

1. Guide shall monitor the work and help the students from time to time.
2. The progress shall be presented before the guide every week during project hours.
3. The students shall design parts, prepare their drawing showing all details and manufacture within the institute / sponsoring industry / workshop in local areas.
4. The guide should maintain a record of progressive / continuous assessment of project work and observe the progress of each group member on weekly basis.
5. The same shall be kept ready for submission to the external examiner before the final examination.

E. Evaluation of Project:
1. The continuous evaluation of individual progress shall be followed
2. External examiner and guide shall jointly evaluate the project.
3. The project can be evaluated on site if it is difficult to bring or demonstrate the trials in the institute
4. The attendance of the student shall carry 05 marks as follows
   - i.   Below 75 %   : 00 marks
   - ii. 75 % and below 80 %   : 02 marks
   - iii. 80 % and below 85 %   : 03 marks
   - iv. 85 % and below 90 %   : 04 marks
   - v.   90 % and above   : 05 marks
5. The details of project assessment are mentioned in Annexure II

F. Project Report:

1. The student shall get the initial draft copy of the project approved from the Project Guide.

2. Structure: It shall be as follows
   - Title page, Inner title page (white), Certificate, Certificate from Industry, Synopsis, Acknowledgment, Table of Contents, List of table & figures (optional), Introduction, Objectives of the Project, Methodology used, Design, Drawing of the part and assembly, Testing, Costing, Result, Conclusions & Scope for future, Merits, Demerits, Applications, Bibliography

- Annexure consists of various designed parts and assembly drawings, photographs, charts, statistical data
- CD of video clips /Power Point presentation

3. Each group has to submit one copy of project report to the library and one soft and hard copy to the department apart from the individual copy.
4. The project report will be of 40 to 50, A4 Size pages with 1.5 line spacing. Font: New Times Roman, left margin 3 cm, right margin 1.5 cm, top margin 2.5 cm, bottom margin 1.5 cm, header & footer 1.5 cm, page numbers, size of font 12 pt, paragraphs left and right justified.
5. Chapters (to be numbered in Arabic) containing Introduction-which usually specifies scope of work and the present developments. Main body of the report divided appropriately into chapters, sections and subsections. The chapters, sections and subsections may be numbered in the decimal form for e.g. Chapter 2, sections as 2.1, 2.2 etc. and subsections as 2.2.3, 2.5.1 etc.
6. The chapter must be left or right justified (font size 16). Followed by the title of chapter centered (font size 18), section/subsection numbers along with their headings must be left justified with section number and its heading in font size 16 and subsection and its heading in font size 14. The body or the text of the report should have font size 12.
7. The figures and tables must be numbered chapter wise.
8. The last chapter should contain the summary of the work carried, contributions if any, their utility along with the scope for further work.
9. Reference OR Bibliography:

   The references should be numbered serially in the order of their occurrence in the text and their numbers should be indicated within square brackets for e.g. [4].
   The section on references should list them in serial order in the following format.
   i. For textbooks – Dr. V.L. Shah & Veena Gore, Limit State Design of Steel Structures, Structures Publications, 1 Edition, 2009.
   ii. For papers - David, Insulation design to combat pollution problem, Proc of IEEE, PAS, Vol 71, Aug 1981, pp 1901-1907.
   iii. Only SI units are to be used in the report. Important equations must be numbered in decimal form.
10. All equation numbers should be right justified.
11. Each student from group shall have one copy with individual certificate only.
12. The project report and progressive assessment sheets are to be submitted before the end of term declared in the Academic Calendar of the institute.

7.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H										
CO2		H									
CO3							M				
CO4	M					L					
CO5				L			M				
CO6			H				H				
CO7			H								

H: High Relationship, M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Software Engineering (SWE)   **COURSE CODE :** 6434

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	--	03	03	Max.	80	20	100	--	--	--	100
					Min.	32	--	40	--	--	--	--

1.0   RATIONALE:

Software engineering is the establishment and sound engineering principles applied to obtain reliable and efficient software in an economical manner. Software engineering is the application of a systematic, disciplined, quantifiable approach to the development, operation and maintenance of software. Software engineering encompasses a process, management techniques, technical methods and the use of tools. This course helps the students to understand software engineering principles.

2.0   COURSE OBJECTIVES:

The student will be able to,
1.   Plan & develop the frame work of project.
2.   Compare various project process models & use in project planning.
3.   Identify the duties & responsibilities of People, team leader & stakeholders while planning the software project.
4.   Schedule the project according to time, size, shape, utility & application.
5.   Understand the basic concept of Quality and standards.

3.0   COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1.   Identify and apply appropriate model for undertaking project
2.   Use software measurement metrics and integrate it with software process
3.   Identify the duties & responsibilities of People, team leader & stakeholders while planning the software project.
4.   Schedule the project according to time, size, shape, utility & application.
5.   Understand the basic concept of Quality and standards.
6.   Understand and apply risk management and project planning concepts

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction to Software Engineering**	1a. Introduction to Software Engineering 1b. Recognize Software Types 1c. Define Relationships 1d. Memorise Layered Approach 1e. Study Interpret Framework 1f. Comparison PSP and TSP 1g. Remember Process Model	1.1 Definition of Software and Characteristics of Software 1.2 Types / Categories of Software 1.3 Software Engineering – Definition, Need 1.4 Relationship between Systems Engineering and Software Engineering 1.5 Software Engineering- A Layered Technology Approach 1.6 Software Development Generic Process Framework- Software Process, Software Product, Software Work-Product, Basic Framework Activities, Umbrella Activities 1.7 Personal and Team Process Models (PSP and TSP) –Concept, Significance with respect to Ongoing Process Improvement, Goals, List of framework activities included 1.8 Prescriptive Process Models- • The Waterfall Model • The Incremental Model • RAD Model • Prototyping Model • Spiral Model	07
Unit-II **Project Management Concept and Metrics**	2a. Explain PPP and W5HH Principle 2b. Explain Measurement, Metrics and Quality 2c. Choose Integrating Metrics	2.1 The management Spectrum-- People, Product, Process, Project, W5HH Principle. 2.2 Software Measurement, Metrics for Software Quality, 2.3 Integrating Metrics within Software Engineering Process, metrics for small Organization	07
Unit-III **Software Project Planning and Risk**	3a. Establish Project Planning 3b. Interpret Risk and it factors	3.1 Project planning objective, Software scope, Resources, 3.2 Software Risk, Risk Identification, Risk Projection, Risk Refinement	06
Unit-IV **Project Scheduling And Tracking**	4a. Outline Scheduling and Tracking	4.1 Basic principles, Relationship Between People and Effort, Task set for Software Project, Scheduling, Error Tracking, The Project Plan	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-V **Software Engineering Analysis And Design**	5a. Construction And Deployment Principles 5b. Requirements Engineering 5c. Analysis Principles 5d. Requirement Specification 5e. Design Approaches	5.1 Communication, Planning, Modeling, Construction & Deployment principles. 5.2 Requirements Engineering Tasks, Initiating the requirement Process. 5.3 Analysis Principles: Information Domain, Modeling, Partitioning 5.4 requirement specification & review 5.5 Design approaches of software & preparation of design model using Design concepts, Design model, pattern based design	14
Unit-VI **Software Quality Management & Estimation**	6a. Basic concepts 6b. Explain Quality assurance 6c. Explain ISO 9000 quality standards 6d. Explain McCall's quality factors. 6e. Explain Decomposition Techniques 6f. Explain Empirical Estimation Model	6.1 Basic Quality Concepts. 6.2 Software Quality Assurance, Statistical software quality assurance, Software Reliability 6.3 The ISO 9000 quality standards 6.4 McCall's quality factors. 6.5 Decomposition Techniques: Problem based Estimation, Process Based Estimation 6.6 Empirical Estimation Model: The structure of estimation models ·COCOMO Model, Software Equation	08
TOTAL			**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	**U Level**	**A and above Levels**	**Total Marks**
I	The Product and The Process	06	06	02	14
II	Project Management Concept and Metrics	06	04	04	14
III	Software Project Planning and Risk	04	04	04	12
IV	Project Scheduling and Tracking	04	02	04	10
V	Software Engineering Analysis and Design	04	06	08	18
VI	Software Quality Management and Estimation	02	04	06	12
	TOTAL	**26**	**26**	**28**	**80**

Legends: R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:
Not Applicable

7.0 STUDENT ACTIVITIES:
Following is the list of proposed student activities like
1. Discuss various software process models.
2. Prepare case study for software engineering.
3. Study latest trends in Software engineering
4. For Software project scheduling and tracking, Use online Software Project Planning and tracking web application like **toms planner**. For more information Please do visit: www.tomsplanner.com/
5. Prepare seminars on various topics like software quality management.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Concept will be introduced in lectures using charts or ppt.
2. Arrange expert seminar of industry person in the area of Software engineering.
3. Arrange expert seminar of industry person on latest trends in Software engineering and various changes in traditional Software Development Process.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Software Engineering- A Practitioners Approach	Roger S. Pressman	Tata McGraw Hill Publication
2	Software Engineering- Principles and Practice	Waman S. Jawadekar	Tata McGraw Hill Publication
3	Software Engineering	Kogent learning solutions inc.	Dreamtech Press

B) Software/Learning Websites
1. http://www.tutorialspoint.com/software_engineering/
2. http://www.freetutes.com/systemanalysis/

C) Major Equipments/ Instruments with Broad Specifications
Not applicable

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	I	j	k
CO1		M		M	H	M	H		M		
CO2	L	L	L				L	M	L	H	
CO3		H	M	L				L	H	M	
CO4									L	H	
CO5	L	M	M								
CO6		M	M	H						H	L

H: High Relationship, M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information technology (IF)
COURSE   : Communication Technology (CMT)   **COURSE CODE   :** 6435

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.		Marks						
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	--	03	03	Max.	80	20	100	--	--	--	100
					Min.	32	--	40	--	--	--	--

1.0 RATIONALE:

In today's world, communication has gained lot of importance and many systems related to communication have been developed like Satellite Communication, Television, Digital Communication and Data Communication.

Electronic Communication techniques is a core technology course which will help students to apply the fundamentals of Electronics for understanding Line of Sight Communication, Sky--wave Communication, Mobile Communication and Satellite communication. It is a theoretical course, which will enable the students to develop cognitive skills.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Understand concepts and basics of electronics communication system
2. Understand the concept of modulation and demodulation of AM and FM.
3. Knows principles of radio wave propagation.
4. Understand analog and digital types of modulation system
5. Know the concept, working and application of satellite communication system.
6. Know the concept, call processing in mobile communication system.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Analyze the waveform of AM & FM.
2. Name different data encoding techniques.
3. Know different wireless technologies.
4. Analyze the different sections of mobile unit.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Basics of Electronic Communication**	1a. Need of communication system. 1b. Define modulation, modulation index, AM, FM, PM. 1c. Classify different communication systems 1d. Draw and explain the block diagram AM and FM (Transmitter and Receiver)	1.1 Block diagram of communication system. 1.2 Electromagnetic spectrum. Need for Modulation. Definitions of modulation index, power relations 1.3 Concept of noise 1.4 Classification of communication systems. 1.5 Comparison of AM, FM, PM on the Basis of Definition, Waveforms, Bandwidth Requirement, Representation in Time domain and Frequency Domain, Modulation Index. (No	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		numericals) 1.6 Demodulation using AM diode detector & FM using Ratio detector. 1.7 Block diagram and function of each block of: AM Transmitter and Receiver, FM Transmitter and Receiver.	
Unit-II **Wave Propagation**	2a. Explain the theory of electromagnetic radiation. 2b. State different types of wave propagation. 2c. Define the various atmospheric layers 2d. Define the terms maximum usable frequency, critical frequency, skip distance & fading.	2.1 Transverse electromagnetic wave. 2.2 Polarization. 2.3 Ground Wave. 2.4 Ionosphere. 2.5 Sky Wave Propagation, 2.6 Effect of changes in atmospheric conditions on sky wave propagation. 2.7 Concept of actual height and virtual height. 2.8 Definitions: Critical frequency, Maximum usable frequency, Skip distance, Fading. 2.9 Space Wave Propagation. 2.10 Duct Propagation. 2.11 Troposphere scatters propagation.	08
Unit-III **Modulation Techniques**	3a. Explain sampling theorem and its types. 3b. Draw & explain Block diagram for generation, Waveforms, working principle of PAM, PWM and PPM. 3c. Draw & explain Block diagram for generation, Waveforms, working principle of ASK, FSK, QPSK, BPSK, DPSK. 3d. Draw & explain Block diagram for generation, Waveforms, working principle of PCM, Delta modulation, Adaptive delta modulation. 3e. Draw block diagram & explain working of DM and ADM. 3f. What is baseband and pass band transmission? 3g. Describe Multiplexing techniques.	3.1 Basics of Pulse Modulation: 3.2 Sampling Theorem: Natural Sampling, Flat Top Sampling and Nyquist Rate. 3.3 Advantages of Pulse modulation over AM. 3.4 Block Diagram for generation, Waveforms, working principle, advantages, disadvantages and applications of PAM, PWM, PPM. 3.5 Block Diagram for generation, working principle, waveforms, advantages, disadvantages and applications of: ASK, FSK, QPSK, BPSK and DPSK. 3.6 Introduction to Digital Communication System: Digital modulation methods 3.7 Block diagram, working principle, waveforms, advantages, disadvantages and applications of PCM, Delta modulation, Adaptive delta modulation. 3.8 Baseband and Passband Transmission 3.9 Multiplexing Techniques: FDM, TDM and WDM -- Definition, Schematic diagram, Principle,	12

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		application, advantages and disadvantages.	
Unit-IV **Data Encoding Methods**	4a. Define bit rate, baud rate and channel capacity, Channel Bandwidth, S/N Ratio. 4b. Explain various types of line coding.	4.1 Introduction to encoding digital data to digital signal. 4.2 Encoding techniques: Unipolar, polar, Bipolar 4.3 Comparison of various techniques. 4.4 Definitions: Data Rate. Baud Rate. Bit rate. Channel Bandwidth. Channel Capacity, S/N Ratio.	06
Unit-V **Satellite Communication**	5a. Draw and explain generalized block diagram of satellite Communication system. 5b. Define uplink & downlink frequency, look angle altitude, elevation angle, Azimuth angle footprint 5c. Enlist functions of satellite. 5d. Explain Construction and working principle of Parabolic dish and horn antenna 5e. Enlist applications of satellite.	5.1 General Block diagram of Satellite communication system. 5.2 Concept of orbit & its types 5.3 Communication link: uplink & downlink frequency, look angle altitude, elevation angle, Azimuth angle, footprint of elevation. 5.4 Frequency bands used in Satellite communication. 5.5 Functions of a satellite. 5.6 Concept of antenna 5.7 Construction and working principle of Parabolic dish and horn antenna. 5.8 Satellite applications (overview).	06
Unit-VI **Mobile communication**	6a. Compare TDMA, FDMA, CDMA 6b. Draw and explain block diagram of cellular mobile phone system 6c. Explain call processing and frequency reuse techniques 6d. Explain Hand off Procedure.	6.1 Principle, advantages and disadvantages of TDMA, FDMA, CDMA 6.2 Concepts of mobile phone. 6.3 Cellular mobile phone system: block diagram, working. 6.4 Frequency bands and types of modulation used for Cellular mobile communication. 6.5 Call processing, Frequency reuse and cell splitting. 6.6 Forward and reverse direction (handset to handset) and (Handset to Landline) Hand Off procedure.	10
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
I	Basics of Electronic Communication	06	06	02	14
II	Wave Propagation	04	04	02	10
III	Modulation Techniques	04	12	02	18
IV	Data Encoding Methods	04	04	02	10
V	Satellite Communication	06	06	02	14
VI	Mobile communication	06	06	02	14
	TOTAL	**30**	**38**	**12**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Download different application based on electromagnetic spectrum.
2. Collect data about AM & FM frequencies from radio stations.
3. Explore websites to understand repairing of various mobile handsets.
4. Download different specifications of basic cellular system.
5. Collect the data about types of modulations used in different communication applications.

7.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show video to demonstrate the working principles, constructional features, testing and understandings of different types of modulations.
2. Arrange a visit to any Radio station
3. Arrange expert lecture of an industry person in the area of communication
4. Arrange faulty electronic circuit and provide to student for repairing (Case study)

8.0 LEARNING RESOURCES:

A) Reference Books

Sr.No.	Title of Book	Author	Publication
1	Electronics Communication System	George Kennedy	Tata McGraw-Hill
2	Electronics Communication	Roddy Collin	Prentice Hall India
3	Electronics Communication System	Wayne Tomasi	Pearson Publications
4	Communication Electronics	Louis E Frenzel	TATA McGraw Hill
5	Telecommunication Principle circuits & systems.	S. Rambhadran	S. Chand. Publication
6	Electronic communication	Sanjeev Gupta	Khanna Publication
7	Mobile Communication	Lee C. Y.	Pearson, New Delhi (Latest Edition)
8	Satellite Communication	Mitra, Monojit	PHI publication
9	Digital Communication	Simon Haykin	John Wiley and Sons, Pvt. Ltd., Singapore
10	Digital Communication	Proakis J. K.	McGraw Hill Book Co., London (Latest Edition)

B) Software/Learning Websites

1. en.wikipedia.org
2. http://www.nptl.com
3. circuitdiagram.net/am-radio-receiver.html
4. http://www.circuitdiagram.org/am-radio-receiver-with-mk484.html
5. www.larnerstv.com
6. www.academia.edu

C) Major Equipments/ Instruments with Broad Specifications

Not applicable

9.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	M		L			M		M		M
CO2	M	L		M	M			M	L		M
CO3	H	M	M		M	M	M		L	M	M
CO4	M		M	L	M		M	M		M	M

H: High Relationship, M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Digital Techniques (DTE)   **COURSE CODE   :** 6436

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	02	05	03	Max.	80	20	100	--	--	25	125
					Min.	32	--	40	--	--	10	--

1.0 RATIONALE:

This course forms the foundation of computers. This course is introduced with the view that students will be familiar with various digital devices and circuits which are used in microprocessor, Computer & other digital systems. This course emphasizes on the combinational and sequential logic design and mainly deals with the medium scale integrated circuits.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Understand various logic families and number system.
2. Understand Boolean algebra and design the logic circuits.
3. Elaborate operation of different digital circuits like combinational circuits, Sequential circuits
4. Know different types of memories in computers.
5. Construct the digital circuits using Logic devices.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Compare Analog and Digital systems.
2. Select a logic gate for specific application.
3. Illustrates the principle of working of simple digital circuits.
4. Assemble/Develop Simple Digital circuits using logic Devices.
5. Troubleshoot the fault in a given digital circuit.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Digital Techniques and Number System**	1a. Compare Analog and Digital System. 1b. Classify Digital logic families. 1c. Comprehend Number systems and Binary codes 1d. Convert one form of number into another. 1e. Solve numerical based on binary and BCD arithmetic.	1.1 Digital signal, Digital and Analog System. 1.2 Comparison of analog and digital system. 1.3 Digital systems- Positive and Negative Logic, Advantages, Disadvantages and Applications of Digital Systems 1.4 Logic families- Characteristics, Classification - TTL, CMOS, ECL (Comparison only) (No circuits) 1.5 Number system and codes: Classification-Binary, Octal, Decimal, Hexadecimal number system, Conversion of one number systems to another, 1's complement and 2's	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		complement, Binary arithmetic, BCD codes (Conversion of invalid BCD numbers into valid BCD number).	
Unit-II **Logic Gates And Boolean Algebra**	2a. Draw Symbol of different kinds of Logic Gates and Classify Logic Gates. 2b. Write Truth Table and Logic expression of various Logic Gates. 2c. State and apply Boolean laws and Demorgan's Theorem to solve Boolean expression. 2d. Simplify Boolean expression using K-map technique.	2.1 Concept of Logic gates, Basic Logic Gates: NOT and, OR with symbol, truth tables, logic equations & applications. 2.2 Universal Logic Gates: NAND, NOR with symbol, truth table logic equations & applications. NOR as a universal gate, NAND as a universal gate. 2.3 Special type of logic gates: EX-OR, EX-NOR: with symbol, truth table & applications. 2.4 Boolean Algebra: Basic Boolean Laws, Demorgan's Theorem, Concept of SOP & POS, Standardization 2.5 Concept of K map: Definition, Advantages, Representation of 2, 3, 4 variable K-map, K- map reduction technique, don't care condition, Reduction of simple Boolean expression using K-map.	10
Unit-III **Combinational Logic Circuits**	3a. Explain basic combinational Logic. 3b. Design Half adder, Subtractor and full adder, Subtractor using K-map 3c. Describe operating principle of working of different Multiplexer and Demultiplexer types. 3d. Draw block diagram and explain operation of different Encoder and Decoder types.	3.1 Introduction to combinational logic circuits 3.2 (a) Half adder and Half Subtractor, (b) Full adder and Full Subtractor: Block diagram, Truth table and designing using K-map and basic logic gates. 3.3 Multiplexers: Necessity of multiplexing, Multiplexer types: 2: 1, 4: 1, 8: 1-Block diagram, operating principle, Truth table & Applications, Multiplexer Tree 3.4 Demultiplexer: Necessity of Demux. Types of Demux: 1: 2, 1: 4, 1: 8- Block diagram, operating principles Truth table & Applications 3.5 Encoder: Definition, Priority Encoders: Decimal to BCD Encoder (IC 74147) – pin diagram, Truth table. 3.6 Decoders: Definition, Types-(3:8 Decoder) – Block diagram, Truth table	12
Unit-IV **Sequential Logic Circuits**	4a. Compare between Combinational and Sequential Logic. 4b. Define triggering and state its types. 4c. Describe the function of various types of flip-flops with the help of Logic diagram and truth table. 4d. Explain the working of various types of Counters	4.1 Introduction to Sequential logic circuit, difference between combinational & Sequential logic circuit. 4.2 One-bit memory cell, clock signal – Triggering methods: edge triggering and level triggering (Positive and Negative). 4.3 Flip Flops - R S flip-flop, Clocked R S flip flop, J-K flip flop, Master slave J-K flip flop, D- flip flop and T-flip flop: using NAND gates - Symbol, Logic	12

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	with the help of circuit diagram, truth table and timing diagram. 4e. Describe the working of various shift Registers with the help of circuit diagram, truth table and timing diagram and State Applications of Shift register.	diagram, working, truth table 4.4 Concept of Preset & Clear, Race around condition 4.5 Counters: Basic concept of counter, Classification of Counters: Synchronous and Asynchronous/ripple. 4.6 Asynchronous counter (3 bit, 4 bit), Mod-N-counter, -Designing, Working, Truth Table, Timing diagram 4.7 Shift register: Definition, Types: SISO, SIPO, PISO and PIPO (4-bit)-Block diagram, Working, Truth Table, Timing diagram and Applications.	
Unit-V **Semiconductor Memories**	5a. Classify semiconductor Memories 5b. State and explain different RAM and ROM types.	5.1 Introduction to memories, Classification 5.2 RAM Types: SRAM, DRAM-Explanation 5.3 ROM Types: PROM, EPROM, E^2PROM-Explanation	02
Unit-VI **Data Converters**	6a. State Necessity of Data Converters. 6b. State Specifications of D/A and A/D Converters. 6c. Explain working of D/A converters and A/D converters.	6.1 Need of data converters, types of data converter 6.2 DAC:R-2R Ladder - Circuit diagram, Working, Advantages and Disadvantages, DAC specifications (No Mathematical Derivations) 6.3 ADC - Successive approximation - Circuit diagram, working, Advantages and Disadvantages-ADC Specifications(No Mathematical Derivations) 6.4 Study of ICs: DAC0808, ADC 0809-Features and Pin Description.	04
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
I	Digital Techniques and Number System	04	06	02	12
II	Logic Gates And Boolean Algebra	02	08	04	14
III	Combinational Logic Circuits	04	10	06	20
IV	Sequential Logic Circuits	04	10	08	22
V	Semiconductor Memories	00	04	00	04
VI	Data Converters	02	06	--	08
	TOTAL	**16**	**44**	**20**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	II	Build/Test the functionality of Basic Logic Gates. • Verify the Truth table of Basic gates (AND, OR, NOT).	02
2	II	Build/Test the functionality of Advance Logic Gates. • Verify Truth table of Advance logic gates (NAND, NOR, EXOR, EXNOR).	02
3	II	Verify the De-Morgan's 1st and 2nd theorem.	02
4	II	Build/Test NAND and NOR as universal gate. (Implement basic gates using universal gates)	04
5	III	Design and Implement Half and full adder circuit. • Verify truth table of Half and Full adder circuit	04
6	III	Build/Test half and full Subtractor circuit using EX-OR and OR logic gates.	04
7	III	Build/Test the 8:1 Multiplexer circuit.	02
8	IV	Verify the truth table of RS, D Flip Flops.	02
9	IV	Build/Test the working of the SISO Shift Register.	02
10	V	Build/Test the operation of 3-bit Asynchronous Counter using JK Flip Flop.	02
11	V	Design and implement mod- 7 counter using JK Flip-Flop.	02
12	VI	A Mini Project (Design, Assemble, Test and Troubleshoot) integrating minimum two digital ICs).	04
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Read and note down specifications of Digital ICs using data sheet: IC number/ Pin Diagram/voltage levels, applications for the following Digital ICs (TTL/CMOS): AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR gates, Decoder, Multiplexer, BCD to 7-segment decoder, SR FF, JK FF, D FF, ADC, DAC. (Any four).
2. Market survey to collect data about Prices of different Digital ICs.
3. Assemble and Test simple Digital circuit on breadboard.
4. Prepare mini project using Various Digital ICs.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show animation videos to demonstrate the working principles Digital circuits like Shift Register, Counter etc.
2. Arrange expert lecture of an Industry Person/Trained Faculties in the area of Digital electronics.
3. Teacher guided self learning activities.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Modern Digital Electronics	R. P. Jain	Tata McGraw Hill
2	Digital Logic and Computer Design	M. Morris Mano	Pearson Education, New Delhi, 2011 or latest
3	Digital Principles and Application	Malvino and Leech	TMH Pub., New Delhi, 6th Edition or latest
4	Digital Electronics and Logic Design	Sharma Sanjay	S. K. Kataria & Sons, 2012 or latest
5	Fundamentals of Digital Circuits	A. Anand Kumar	PHI, 2009 or latest

B) Software/Learning Websites
1. http://www.alldatasheet.com
2. http://www.asic-world.com/digital/index.html
3. http://www.digitalcircuits.com

C) Major Equipments/ Instruments with Broad Specifications
1. Digital Logic Trainer Board
2. Cathode ray oscilloscope
3. Regulated power supply
4. Breadboards
5. Logic Gates – Experimental kit
6. Half and full Adder, Subtractor – Experimental kit
7. Demorgan's theorem – Experimental kit
8. NAND AND NOR gate as Universal gate– Experimental kit
9. RS, D Flip Flop – Trainer kit
10. SISO Shift Register-Trainer Kit
11. Asynchronous Counter Using JK-Flip Flop-Trainer Kit
12. Digital IC tester

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	L	L								
CO2	L	M	H								
CO3	L	H								L	L
CO4	L		H								
CO5	L		H						L	L	

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)

COURSE : Java Programming (JPR)　　　　　　**COURSE CODE** : 6437

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	04	07	03	Max.	80	20	100	25	--	25	150
					Min.	32	--	40	10	--	10	--

1.0 RATIONALE:

Java language is an object oriented programming language that was designed to meet the need for a platform independent language. Java used to create Application that run on a single computer as well as distributed network. Java is both a language and a technology used to develop Internet based Applications with this increasing use of Internet. Java has become a widely used programming language.

Further this course, which includes learning core java, forms a foundation for learning advanced Java.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Explain object oriented programming concept of java.
2. Use inheritance, package and interfaces.
3. Use multithreading and exception handling.
4. Understand applet and use graphics programming, java collections, handle files.
5. Use java programming concepts to write and implement small java applications.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Understand and apply object oriented programming concepts of java.
2. Implement inheritance, packages and interfaces.
3. Implement multithreading and exception handling.
4. Create applet and use graphics programming, collections, handle files.
5. Use java programming concepts to write and implement small java applications.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction And Features of Java**	1a. Features of Object Oriented Programming 1b. Java Features 1c. Data Types in Java 1d. Operator and Expression 1e. Decision making and Branching Statement. 1f. Decision making and Looping Iteration.	1.1 Object and Classes, Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic Binding, Reusability of Code, Modularity of Code. 1.2 Simple, Compiled and Interpreted, Platform independent and portable, Object oriented 1.3 Distributed, Multithreaded and interactive, High performance, Secure., difference between JDK, JRE, JVM 1.4 Data Types, Constant, Symbolic Constant, Scope of variable, Type casting, standard default values, Java Literals. 1.5 Arithmetic Operators, Bit wise Operator, Relational Operators, Boolean Logical Operators, Assignment Operator, Increment and Decrement Operator, Conditional Operator, Operator Precedence. 1.6 Java's Selection Statement, if statement, The if else statement, The else if ladder, The switch statement, The ?: Operator 1.7 The While statement, The do while statement, The **for** statement, The For-Each version of the for loop, Nested Loops, Jumps in Loops, Labeled Loops, Mathematical Functions - min(), max(), sqrt(), pow(), exp(), round(), abs().	10
Unit-II **Classes, Object and Methods**	2a. Defining a class, creating object 2b. Inheritance 2c. Visibility Control 2d. Array, Strings, Vectors and Wrapper Class	2.1 class Fundamentals, Declaring and Creating object, Accessing class members and methods, Constructors, this keyword, Garbage collection, finalize() method, Method Overloading, Static Member, using Command-Line arguments, using Objects as Parameters., nested classes. 2.2 Types of Inheritance, single Inheritance, multilevel Inheritance, Hierarchical Inheritance, method & constructor Overloading & overriding, dynamic method dispatch, final variables, final methods, use of super, abstract methods & Classes, static members. 2.3 Public access, Default access, Private access, Protected access. 2.4 Arrays, One Dimensional array, Creating an array, Two Dimensional array, String, StringBuffer, Vectors, Wrapper Classes	08
Unit-III **Packages and Interfaces**	3a. Packages 3b. Interface	3.1 Define a Package, Access Protection, Creating Package, Import a package, adding a class and interfaces to a package 3.2 Defining interfaces, Extending interfaces, Implementing interfaces, Accessing Interface variable, Applying Interfaces.	08
Unit-IV	4a. Multi Threading	4.1 The Java Thread Model, The Main Thread,	08

161

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Multithreaded Programming and Exception handling	4b. Managing Errors and Exceptions	Creating Thread By extending to thread class & by Implementing runnable Interface, Life cycle of thread: thread methods: wait(), sleep(), notify(), resume(), suspend(), stop()., Creating multiple Threads, using isAlive() and join(), Thread Priorities, Synchronization, Interthread Communication, Suspending, Resuming and, Stopping Threads. 4.2 Exception handling fundamentals, Exception Types, Using Try and Catch, Multiple try and catch statement, throw, throws, using finally statement, Creating own Exception, Chained Exceptions.	
Unit-V **Graphics Programming And Internet**	5a. Applet Programming 5b. Graphics Programming	5.1 Applet Class, Applet Architecture, Local and remote applets, How applet differ from application, Preparing to write applets, Building applet code, Applet life cycle, Applet tag, Adding Applet to HTML file, Running the Applet, Passing parameter to applet 5.2 The Graphics Class, Lines and rectangle, Circle and Ellipse, Drawing Arcs, Drawing Polygons, Line Graphs, working with Color, Color methods, working with Fonts, Font Metrics, Determining available Fonts	08
Unit-VI **File I/O and Collection frame work and More Utility Classes**	6a. File Classes 6b. Introduction to collections frame work 6c. Utility Classes	6.1 Stream classes, byte stream (FileInputStream and FileOutputStream), Character stream (FileReader and FileWriter), Serialization., basic file operations 6.2 Introduction to collections framework, Array List, LinkedList, HashSet class, using Iterator, Map class. 6.3 Date, Calendar, Random.	06
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Introduction And Features of Java	06	04	04	14
II	Classes, Object and Methods	04	04	04	12
III	Packages and Interfaces	06	02	04	12
IV	Multithreaded Programming and Exception handling	04	06	06	16
V	Graphics Programming And Internet	02	06	06	14
VI	File I/O Streams and Collections and more Utility Classes	02	04	06	12
	TOTAL	**24**	**26**	**30**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

*Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hours
1	I, II	Write a simple java program to demonstrate use of command line arguments in java. (Addition of two numbers, use of mathematical functions).	04
2	II	Write a Java Program to define a class, overload the constructors and instantiate its object	04
3	II, II	Write a Java Program to define a class, define instance methods and overload them and use them for dynamic method invocation.	04
4	II	Write a Java Program to demonstrate use of nested class.	04
5	II	Write a Java Program to practice • Use of single Dimensional array. • Use of multidimensional array.	04
6	II	Write a Java program to practice • Using String class and its methods. • Using String Buffer class and its methods.	04
7	II	Write a Java Program to implement Wrapper classes and their methods.	04
8	III	Write a Java Program to implement multilevel inheritance by applying various access controls to its data members and methods.	04
9	III	Write a program to demonstrate • Use of implementing interfaces. • Use of extending interfaces.	04
10	IV	Write a program to implement the concept of threading.	06
11	IV	Write a program to implement the concept of Exception Handling • Using predefined exception. • By creating user defined exceptions.	04
12	V	Write a program using Applet • To display a message in the Applet. • For configuring Applets by passing parameters.	08
13	VI	Write program to demonstrate use of I/O streams.	04
14	VI	Write a Program to use of Array List class/Linked List class/ Map class.	06
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Study different IDE available for java. e.g. eclipse, netbeans.
2. Study available small java application developed on internet and reuses it in your application.
3. Present your application and discuss various aspects of software e.g. security, efficiency, cost etc.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert seminar of industry person in the area of software development in java.
2. Conceptual knowledge will be shared interactively using LCD projector.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	The complete reference java seventh edition	Herbert Schildt	Tata McGraw Hill
2	Programming with java	E. Balagurusamy	BPB Publication
3	Java2 programming	Keyur Shah	Tata McGraw Hill
4	Java2 Unleashed	Jawroski	Techmedia

B) Software/Learning Websites

1. http://www.oracle.com/technetwork/java/index.html
2. http://www.tutorialspoint.com/java/
3. http://www.javatpoint.com/java-tutorial
4. http://www.wikihow.com/Install-Ubuntu-Linux
5. http://www.sun.java.com

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments	Specifications
1	Desktop Computer	Processor: intel core i5 Memory: at least 4GB RAM Hard drive: at least 320GB hard disk
2	LCD Projector	Display Type: LCD Light Output: 3200 Lumens

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	H	H	L	L						
CO2		H	H								
CO3			H	H			M	L			
CO4	M	M		H	H		M				
CO5				H		L	M	H	M	H	H

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)

COURSE : Software Testing (STG) **COURSE CODE :** 6438

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	02	05	03	Max.	80	20	100	--	--	25	125
					Min.	32	--	40	--	--	10	--

1.0 RATIONALE:

This course is for teaching the basic to advanced level concepts in software testing. It also includes technical as well as supporting skills necessary to become successful tester. In this course student will learn how to immediately find problems in any computer program, how to plan an effective test approach, how to clearly report your finding and how to tell when your software is ready for release.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Find defects which may get created by programmer while developing software.
2. Ensure that end results meet business and user requirements.
3. Apply manual and automation testing of software to ensure its correctness, completeness, quality and security and also report the testing efforts to test manager and developer.
4. Design test plan for effective test approach.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Identify impact of software bug and importance of software testing.
2. Select appropriate method for testing depending on purpose of testing and apply it.
3. Design test cases for any software under test.
4. Execute test cases on software under test to validate its functionality.
5. Report the testing efforts in manual format and in defect tracking system.
6. Use various automation tools for testing.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Software Testing Background**	1a. Identify need of software testing 1b. Define suspicious situation as a bug 1c. Describe various terminologies used in testing later on wherever needed.	1.1 Software error case studies – Disney Lion King, Intel Floating Point Division Bug, NASA Mars Polar Lander, Y2K Bug 1.2 Bug: Terms for software Failures, A Formal Definition, Bug occurrence, cost of bugs, Goal of software tester, Traits for Good software tester 1.3 Software Development life cycle 1.4 Software Testing: Definition, goal of Software Tester 1.5 Testing Axioms 1.6 Software Testing Life Cycle 1.7 Software Testing Terms: Precision and Accuracy, Verification and Validation,	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		Quality and Reliability, Quality Control, Quality Assurance, V model.	
Unit-II **Testing methodologies**	2a. Distinguish between various testing methods. 2b. Identify purpose and accordingly select appropriate method. 2c. Apply various black box testing techniques.	2.1 Black Box and White Box Testing 2.2 Static and Dynamic Testing 2.3 Static Black Box Testing: Testing the Specification, Performing a High-level Review of the Specification, Low level Specification Test Techniques 2.4 Dynamic Black Box Testing: • Test-to-pass and Test-to-Fail, • Equivalence Partitioning, • Data Testing: Boundary Conditions, Sub-Boundary Conditions, Default, Empty, Blank, Null, Zero and None, Invalid, Wrong, Incorrect and Garbage Data • State Testing: Testing Software's Logic Flow, Testing States to Fail • Other Black Box Test Techniques: Behave like a Dumb User, Look for the Bugs where you have already found them, think like a Hacker, Follow experience, intuition and Hunches	08
Unit-III **Code Examination**	3a. Distinguish between various testing methods 3b. Identify purpose and accordingly select appropriate method 3c. Apply various white box testing techniques 3d. Distinguish Dynamic White Box Testing and Debugging	3.1 Static White Box Testing: • Formal reviews: Peer Reviews, Walkthrough, Inspection • Coding Standards and Guidelines • Generic Code Review Checklist: Data Reference Errors, Data Declaration Errors, Computation Errors, Comparison Errors, Control Flow Errors, Subroutine Parameter Errors, Input/Output Errors 3.2 Dynamic White Box Testing • Testing the Pieces • Data Coverage: Data Flow, Sub Boundaries, Formulas and Equations, Error Forcing • Code Coverage • Dynamic White Box Testing Vs Debugging	08
Unit-IV **Types of testing**	4a. Differentiate among various types of testing 4b. Identify appropriate type of testing according to requirement of testing. 4c. Test the software with respect to all	4.1 Unit Testing: Stub and Driver 4.2 Integration Testing: Top-Down, Bottom-Up, Sandwich approach 4.3 System Testing: Functional Requirement testing and Non Functional Requirement Testing 4.4 Acceptance testing: Alpha and Beta testing. 4.5 Other Testing techniques 4.6 Website testing	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	types of testing. 4d. Test the website		
Unit-V **Test Documentation**	5a. Create Test plan 5b. Report the defects manually 5c. Report the defect using defect tracking system	5.1 Test Planning: The goal of the test Planning • Test Planning Topics: high level expectations, people, places and things, definitions, Inter group Responsibilities, what will and won't be tested, test phases, test strategy, resource requirements, tester assignments, test schedule, test cases, Metrics and Statistics, Risk and Issues. 5.2 Writing and Tracking Test Cases: Test case planning, test design, Test Case, test procedures, test case organization & tracking. 5.3 Test Report: A bug's life cycle, 5.3.1 Bug tracking system: Manual Bug Reporting and Tracking, Automated bug reporting and tracking.	08
Unit-VI **Automation testing and Test tools**	6a. Differentiate between manual and automation Testing 6b. identify appropriate type of automation tool according to test requirement	6.1 The benefits of automation and tools 6.2 Test tools: Viewers and Monitors, Drivers, Stubs, Stress and load tools, Interference injectors and noise generators, analysis tools. 6.3 Software Test Automation: Macro Recording and playback, programmed macros, Fully Programmable Automated Testing Tools 6.4 Testing: Random Testing and Monkey tools 6.5 Realities of using test tools and automation.	08
TOTAL			**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Software Testing Background	04	04	04	12
II	Testing methodologies	04	08	04	16
III	Code Examination	04	04	04	12
IV	Types of testing	04	08	04	16
V	Test Documentation	04	04	04	12
VI	Automation testing and Test tools	04	04	04	12
	TOTAL	**24**	**32**	**24**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hours
1	I	Study any software system specification and design test cases.	04
2	II, V	Design test cases for notepad application	02
3	III, V	Create any GUI application and report bugs.	04
4	IV	Perform testing of any website and report bugs.	02
5	IV	Design test cases for college admission form.	02
6	IV	Design test cases for Social site (Twitter, Facebook) login form.	02
7	II, IV	Write test cases for usability testing of website.	02
8	VI	Automate any web application for Web Testing. (e.g. Selenium).	04
9	VI	Report the bugs using Bug Tracking Tool (e.g. Bugzilla).	02
10	VI	Automate any application for test management tool (e. g. Test Link).	04
11	VI	Automate any Installation Procedure (e.g. WinZip) using Auto IT.	04
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Searching various automation testing tools for efficient testing.
2. Handling various open source tools for test management.
3. Handling various open source tools for defect tracking
4. Prepare SRS documents based on case study.
5. Discuss various case studies available on internet
6. Perform testing of own developed software project.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange a visit to Software Industries for actually observing testing methodologies they are applying.
2. Arrange expert lecture of industry person in the area of Software testing and test automation.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Software Testing	Ron Patton	PEARSON
2	Software Testing: Principles and Practices	Srinivasan Desikan Gopalaswamy Ramesh	PEARSON
3	Software Testing: Principles, Techniques and Tools	M. G. Limaye	Tata McGraw-Hill

B) Software/Learning Websites

1. http://en.wikipedia.org/wiki/Test_automation
2. http://en.wikipedia.org/wiki/Software_testing#Testing_tools
3. http://www.softwaretestingsoftware.com
4. http://www.etestinghub.com/
5. http://www.tutorialspoint.com/software_testing/
6. http://www.testingturorials.net/
7. http://www.softwaretestingbuzz.com/

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments	Specifications
1	Desktop Computer	PC Specifications to be followed: Processor: i3 or i5 RAM: 4 GB or better HDD: 1 TB SATA Monitor: TFT LCD OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate Antivirus: User License for three year
2	LCD Projector	Display Type: LCD Light Output: 3200 Lumens
3	Selenium	Web testing tool Freeware
4	Winrunner	Web testing tool Freeware
5	Bugzilla	Defect tracking tool
6	Test link	Test management tool

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1		H	M					H	L		
CO2		H	M	H	H			M	L		M
CO3			L	H				M	L		M
CO4		M	L	H							
CO5			L	H							
CO6		H	M	H							L

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Scripting Technology (SPT)   **COURSE CODE :** 6439

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
02	--	04	06	--	Max.	--	--	--	25	--	25	50
					Min.	--	--	--	10	--	10	--

1.0 RATIONALE:

The scope of internet and Web technology is growing very rapid, as a result it's far crucial to expand the manpower in those regions. The newcomers will be aware about various gear used in dynamic internet page designing and hosting of web sites. This course contains tools for developing client and server side web applications.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Create the program for web application and web communication.
2. Design the HTML programming for client style.
3. Design web applications with server side programming

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Acquires the knowledge basic of scripting languages.
2. Knows the strength, weakness and applicability of scripting language.
3. Develop the dynamic generated web content by using scripting language
4. Build appropriate user interfaces to scripting language.
5. Use built-in scripting function such as math and string.
6. Recognize the problem modeling approach with modularity using functions in scripting.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction to JavaScript**	1a. Introduction to Java Script Variables and constants.	1.1 Using Java Script in HTML pages. 1.2 Declaration of Variable and Constant 1.3 Private, public Variables and their scopes, Data type Conversion 1.4 Declaration, evaluation and Scope of variables 1.5 Literals-- Array, Boolean, Floating point, Integer, Object String	04
Unit-II **Expressions in Java Script**	2a. Java Script operators and Expressions.	2.1 Operators – Assignment, Comparison, Bit wise, logical, string, special 2.2 Regular Expressions in JS	04
Unit-III **Flow Control Statements in**	3a. Learn Different conditional and looping statements in Java Script	3.1 Conditional – If…else, switch 3.2 Loop – for, do…while, while, label, break, continue 3.3 Object Manipulation – for…in, with	05

170

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
JavaScript	3b. Explore Exception handling.	Comments 3.4 Exception handling – throw, try…catch	
Unit-IV **Functions in JavaScript**	4a. Explore user Defined and Predefined Function.	4.1 Using user defined functions 4.2 Argument array 4.3 Predefined functions – Eval, is Finite, Is Nan, escape, unescape, ParseInt, ParseFloat and other number and string functions	05
Unit-V **Introduction to VBScript**	5a. Introduction to VBScript Variable	5.1 Private, public their scopes 5.2 Data type Conversion 5.3 Declaration, evaluation and scope of variables	04
Unit-VI **Flow Control Statements In VBScript**	6a. VBScript Conditional and looping statements	6.1 Conditional – If…else, Select 6.2 Looping – for, do…while, while 6.3 Object Manipulation – for each…in.	04

Unit-VII
 	
VBScript Build in functions
	7a. Explore Build in functions of VBScript	7.1 Built in Functions
		  • Date/Time Functions
		  • Conversion Functions
		  • Format function
		  • Mathematical function
		  • Array function
		  • String Functions
		7.2 User Defined Functions
			06

		TOTAL	**32**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I,	Write a JavaScript to create webpage	06
2	II	Write a JavaScript to implement different types of operators	06
3	II	Write a JavaScript to implement various conditional statements	06

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
4	II	Write a JavaScript to implement various looping statements	06
5	III	Write a JavaScript to implement concept of built in functions and user defined functions	08
6	IV	Write a VBScript to assignment on creation of webpage	06
7	V	Write a VBScript to implement different types of operators	06
8	VI	Write a VBScript to implement various conditional statements	08
9	VI	Write a VBScript to implement various looping statements	06
10	VII	Write a VBScript to implement concept of built in functions and user defined functions	06
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:
Following is the list of proposed student activities like
   1. Prepare a mini project by using scripting concepts.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
   1. Demo lectures with power point presentations using LCD projector should be arranged to develop

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Teach yourself JavaScript in 21 days	Michael Moncur	Techmedia
2	JavaScript Step by Step	Steave Stuhring	O'Reilly Media
3	Learning JavaScript	Shelley Powers	O'Reilly Media
4	JavaScript, A Beginner's Guide Third Edition	John Pollock	McGraw Hill
5	VBSCript Programmer reference	Adrian KingSLEY Danial Read	WROX
6	VBSript a Beginner Guide	Jyoti Giramankar	Create Space
7	VBScript in a nutsheel	Matchilds RON	O'Reilly Media

B) Software/Learning Websites
   1. www.w3school.com/
   2. www.javatpoint.com

C) Major Equipments/ Instruments with Broad Specifications
   1. Hardware: Desktop Computer P-IV processor or higher
   2. Software: Web Brower, Notepad, C++, Sublime Text.

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	M	H					M				
CO2		H	H			L					
CO3		M		L	L				L		H
CO4		H			L	M	M	L			M
CO5	L	H	M								
CO6		H	H			H				L	M

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Object Oriented Modeling and Design (OOM)   **COURSE CODE :** 6537

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	02	05	03	Max.	80	20	100	--	25	25	150
					Min.	32	--	40	--	10	10	--

1.0 RATIONALE:

Modelling plays an important role in software development. Real world scenario like customers requirements are mapped to the models for an implementation. This course presents an object oriented approach to software development. The graphical notation described in courses helps the software developer to visualize a problem before going for implementation.

This course will be useful for the student to understand the concepts of Object Oriented Programming System and to model these concepts using UML for any application, before actually going for coding part.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Interpret the meaning of object oriented concepts and Object modelling technology.
2. Apply an object model and draw basic class diagrams for a given problem statement.
3. Create custom UML profile to accurately model different system domains.
4. Draw sequence, activity and state diagram for given problem statement.
5. Design the components, deployment modules for software.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Handle anyone design tool like rational rose to draw the diagrams.
2. Capture the high level requirement into modeling concepts.
3. Design basic use case and class diagram by identifying user's needs.
4. Draw the sequence of information flow, states of systems.
5. Visualize the architectural view of software for better understand to the customers.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Importance of Modelling**	1a. Describe the basic concepts object oriented themes and technology. 1b. Apply the use case driven approach and CRC card method.	1.1 Object Orientation. 1.2 OOM Themes: Abstraction, Encapsulation, Combining data and Behavior. 1.3 Brief overview of Object Modelling Technology (OMT) by Ram Baugh, Booch Methodology. 1.4 Use Case driven approach (OOSE) by Jacobson 1.5 Overview of CRC card method by Cunningham.	10
Unit-II **Object**	2a. Identify the relationship between multiplicity,	2.1 Object and Class Concepts: • Objects, Classes, Basic Class Diagrams.	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Modelling	aggregation and object modelling. 2b. Applying link and association concept in class diagram. 2c. Designing the object models.	• Values and Attributes. • Operations and Methods. • Link and Association concepts: Links and Associations, Multiplicity, Association and Names, Ordering, Association Classes, Qualified Association • Generalization and Inheritance: Use of Generalization, Sample Class Model 2.2 Multiplicity, Aggregation and Object Modelling. • Multiplicity, Aggregation. • Aggregation Versus Association • Propagation of operations • Multiple Inheritance, Metadata and Constraints-Metadata, Constraints on objects and links • Object modelling • Object instances • Sample Object Model.	
Unit-III **Basic Behavioral Modelling**	3a. Interpret scope of UML diagram. 3b. Draw use case diagram. 3c. Draw advance Class diagrams, object diagram and identify relationship between classes.	3.1 OMG, approval for UML, Scope of UML, Introduction to UML Diagrams. 3.2 Use case Diagram • Notations for Use case diagram: use cases, Actors, Communication • lines, System boundaries • Use case relationships: Include and extend, Use case generalization • Sample use case diagrams 3.3 Advanced Class Diagrams: Advanced Classes and Relationships, Interfaces, Types and Roles, Packages, Instances. Object Diagrams.	12
Unit-IV **Advanced Behavioral Modelling**	4a. Draw the Sequence Diagrams. 4b. Draw the Activity Diagram. 4c. Draw the State Diagram.	4.1 Sequence Diagrams • Notations for Sequence diagram: Objects / Participants, Time, events, Activation Bars, signals, message arrows, synchronous and asynchronous messages, return message, create and destroy message • Structured control: optional, conditional, parallel, loop execution • Sample sequence diagrams. 4.2 Activity Diagram • Notations for Activity Diagram: Actions and Activity nodes, • Initialization and completion, Decisions, Join and fork • Doing multiple tasks at the same	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		time: Swim lanes • Sample Activity Diagram 4.3 State Diagram • Notations for State diagram - initial state, final state, transitions and conditions, activity, event • Nested state diagram, concurrent / composite state diagram • Sample state diagram.	
Unit-V **Architectural modelling**	5a. Draw the Component Diagram 5b. Draw the Deployment diagram.	5.1 Component Diagram • Notations for component Diagram: component and interfaces, ports, connectors. • Sample Component Diagram 5.2 Deployment Diagram • Notations for Deployment diagram: nodes, artifacts, node • Instances, communication between nodes. • Sample Deployment diagram.	08
TOTAL			48

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Importance of Modeling.	06	04	06	16
II	Object Modeling	06	04	08	18
III	Basic Behavioral Modeling	06	04	06	16
IV	Advanced Behavioral Modeling	08	04	04	16
V	Architectural modeling	06	06	02	14
	TOTAL	**32**	**22**	**26**	**80**

Legends: R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:
The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
1	I	Study of Object oriented modelling concept.	02
2	II	Draw object and class diagram.	04
3	III	Draw use case diagram.	02
4	III	Draw advance class diagram.	04
5	IV	Draw sequence diagram.	04
6	IV	Draw activity diagram	04
7	IV	Draw state diagram.	04
8	V	Draw component diagram.	02
9	V	Draw deployment diagram.	02
10	V	Mini project	04
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Draw UML diagram as a MINIPROJECT for management system
   a. Library management system
   b. College management
2. Visualize any 10 UML diagram using rational rose tool as well as draw on a paper.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Showing previous project reports to students for UML ideas.
2. Gather SRS from clients and draw structural, behavioral and architectural models with respect to it.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Object oriented modelling and design with UML 2.0 (second edition)	Blaha and Rumbaugh	Pearson
2	The unified modelling language user guide (second edition)	Booch, Rumbaugh, Jacobson	Pearson education
3	Learning UML 2.0	Miles and Hamilton	SPD O'REILLY

B) Software/Learning Websites

1. http://www.iknowledgebase.wikispace.com
2. http://uml-tutorials.trireme.com/
3. http://www.uml-diagrams.org/index-examples.html (refer for case studies)
4. http://www.tutorialspoint.com/uml/uml_class_diagram.htm

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments	Specifications
1	Desktop Computer	PC Specifications to be followed: Processor: i3 or i5 RAM: 4 GB or better HDD: 1 TB SATA Monitor: TFT LCD OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate Antivirus: User License for three year
2	LCD Projector	Display Type: LCD Light Output: 3200 Lumens
3	Rational Rose Software	License

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1		M		M		L			H	L	H	
CO2		M			M				M	H	H	M
CO3		H		M	M	L			M	H	H	
CO4		H		M	M	L			M	H	H	M
CO5		H		M	M	L			M	H	H	M

H: High Relationship, M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology (IF)
COURSE : Information Security(IFS) **COURSE CODE :** 6538

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	02	05	03	Max.	80	20	100	--	25	25	150
					Min.	32	--	40	--	10	10	--

1.0 RATIONALE:

The goal of Information Security is to familiarize students with the security issues and technologies involved in modern information systems. Students will gain an understanding of the various ways in which information systems can be attacked and tradeoffs in protecting networks. Students will gain an appreciation of the need to develop an understanding of underlying system applications and potential security issues early in the design process.

New communication systems and digital technology have made dramatic changes in the way we live and the means to transact our daily business. Businessmen are increasingly using computers to create, transmit and store information in electronic form instead of traditional paper documents. It is cheaper, easier to store and retrieve and speedier to communicate. This will enable them to develop a sound knowledge and analytical ability facilitating their intellectual and professional development and future employment.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Understand basics of information security
2. State legal, ethical and professional issues in information security
3. Describe about cyber crime and cyber security
4. Comprehend formation quality and audit
5. Demonstrate how to encrypt and decrypt messages using transposition and substitution methods.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Describe pillars of information security
2. State the principles of information security
3. Understand the information security management
4. Understand the need of physical security
5. Different Authorization and Authentication mechanism
6. Overview of different standards and frameworks
7. Explain the use of information security in electronic world

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction to Information Security architecture**	1a. Recall basic of Information 1b. Describe information classification 1c. Analyze information security management 1d. State and explain	1.1 Information, Need and Importance of Information, information classification, criteria for information classification 1.2 Security, need of security, Basics principles of information security 1.3 Information security and Risk Management, Security policies,	14

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
and model	security policies and standard. 1e. Define concept of TCB 1f. Comprehend common criteria for information security evaluation	guidelines, standards 1.4 Trusted computing base, Rings of Trust, Protection Mechanisms in a trusted Computing Base 1.5 System security assurance concepts, Trusted computer security Evaluation Criteria 1.6 Information Technology security Evaluation Criteria, Confidentiality and Integrity Models.	
Unit-II **Cryptography**	2a. Describe Common term related to field of cryptography 2b. Demonstrate how to encrypt and decrypt messages using transposition and substitution method 2c. Define stenography 2d. Purposes and uses of digital signatures	2.1 Introduction, Application of cryptography, Classical encryption Techniques, Symmetric cipher 2.2 Substitution cipher • Ceasor cipher • Playfair cipher • Hill cipher 2.3 Transposition cipher • Row transposition cipher • One Time Pad 2.4 Steganography, Digital Signatures, Authentication Protocols, Digital Signature Standards	12
Unit-III **Application and web security**	3a. Understand web security 3b. Identify various security techniques for web security	3.1 Application hardening, application patches, web servers, active directory 3.2 Web security threats, web traffic security approaches, secure socket layer and transport layer security, secure electronic transaction 3.3 Software development: secure code techniques, buffer overflows, code injection, least privilege, good practices, requirements, testing	06
Unit-IV **Data Recovery and cyber security**	4a. Understand recovery of data from different ways 4b. Remember about different cyber crimes 4c. Know IT acts in India	4.1 Introduction to Deleted File Recovery Formatted Partition Recovery, Data Recovery Tools, Data Recovery Procedures and Ethics. 4.2 Introduction to Cyber Crimes – Hacking, Cracking, Viruses, Virus Attacks, Pornography, Software Piracy, Intellectual property, Legal System of Information Technology, Mail Bombs, Bug Exploits, Cyber Crime Investigation 4.3 Introduction Cyber Laws- Introduction to IT act 2000 and IT act 2008, Introduction to the cyber laws	08
Unit-V **Access, physical control and compliance standards**	5a. State the need of physical security 5b. Differentiate different Authorization and Authentication mechanism 5c. Overview of different	5.1 Identification, Authorization, Authentication, Biometrics, Single Sign –on, Kerberos, Remote user access and Authentication. 5.2 Physical access control, Physical access threats, providing physical security. 5.3 Compliance standards: Implementing	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	standards and frameworks	and Information Security Management System, ISO 27001, ISO 20000, BS 25999, PCI DSS, ITIL framework, COBIT framework	
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Introduction to Information Security Information architecture and model	08	04	04	16
II	Cryptography	08	04	06	18
III	Application and web security	04	04	04	12
IV	Data Recovery and cyber security	08	06	04	18
V	Access, physical control and compliance standards	08	04	04	16
	TOTAL	**36**	**22**	**22**	**80**

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

Sr.No.	Practical Exercises (Any Five Visits and Five Reports/Assignments)	Approx. Hrs. required
1	Knowing the security provided with windows operating system	02
2	Recovery the password of windows machines using password recover utility (John the ripper) or any other utility	02
3	Tracing of email origin using eMailTracePro utility	02
4	Use of keylogger and anti-keylogger to secure your system	02
5	Encrypt and decrypt the message using Simple Transposition – Permutation(Cryptool) 04	04
6	Encrypt and decrypt the message using Caesar Cipher With Variable	04
7	Encrypt and decrypt the message using 3 X 3 Hill Cipher(Cryptool)	04
8	Create Digital Signature document using (Cryptool)	04
9	Send and receive secret message using Steganography techniques using steghide	04
10	Recover the data from formatted Pen drive and Hard Disk using powerdataRecovery utility or any other utility	04
	TOTAL	**32**

7.0 STUDENT ACTIVITIES:
Following is the list of proposed student activities like
1. Prepare charts on cyber security laws and acts.
2. Prepare charts on security policies and standards.
3. Case study on cyber security challenges
4. Assign privileges to various users for checking access control over systems and networks
5. Apply authentication techniques for securing data

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Visit cyber investigation cell to know more about cyber laws
2. Expert Lectures on Ethical Hacking

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Principles of Information Security	Whitman	Cengage India
2	Information System Security	Godbole Nina	John Wiley
3	Information Security Principles and Practices	Mark Merkov & Jim Breithaupt	Pearson
4	Cryptography and Information Security	V.K. Pachghare	Prentice Hall India
5	Information Security and Cyber Laws	Saurabh Sharma	Vikas Publishing House
6	Computer Networking	Tularam M. Bansod	Dreamtech Press

B) Software/Learning Websites
1. CrypTool 1.4.21 (www.cryptool.org)
2. http://www.emailtrackerpro.com
3. http://www.kmint21.com (Keylogger)
4. http://www.jjtc.com/Steganography/tools.html
5. http://steghide.sourceforge.net/ (stegnography)
6. http://www.powerdatarecovery.com/ (data recovery)

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments/ Instruments	Specifications
1.	Desktop Computer	Processor: PIV or above HDD: 40GB Min, RAM: 2GB or above OS: 32 bit or 64 bit
2.	Programming Language	C or Java or.NET
3.	Open Source tools for Security	Cryptool

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1					M	H			M		
CO2		H	L								M
CO3	H					H		H			
CO4			M		H		L				M
CO5	H	M		M		H		M		M	
CO6		M			M						M
CO7	H					H	M		L		

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Advance Database Management (ADM)   **COURSE CODE :** 6539

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	02	05	03	Max.	80	20	100	--	25	25	150
					Min.	32	--	40	--	10	10	--

1.0 RATIONALE:

This course is associated with the designing of database for business, scientific and engineering application. By the end of this course the student will be able to write simple and advanced PL/SQL code blocks, use advanced features such as ref cursors and bulk fetches and database designing with normalization. Hence students will be able to design relational database which will help them in designing phase of projects in forthcoming semester.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Discriminate different database concepts.
2. Memorize Oracle architecture with its components.
3. Create, design and build queries and using Oracle 10g express edition
4. Develop Dynamic web application with database interaction (Specifically Java Programming Language)
5. Experiments with handling data collection with reliability and management of data with transformation in a secure environment
6. Demonstrate the Network configuration between the database clients and servers. As well make use of Database backup and recovery.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Recognize the importance of DBMS effectiveness. As well demonstrate installation and use of oracle
2. Making use of Oracle Objects, Managing User. As well work with Table Space. Using System Privileges for Database Security
3. Comprehend the concept, importance, need of database recovery with various recovery techniques
4. Analyze and distinguish the Emerging Database Technologies and integrate database for dynamic Web Application Development
5. Describe, Summarizing and Recognize various Oracle Networking and performance tuning

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics		Hours
Unit-I **Introduction to DBMS and Oracle**	1a. DBMS Introduction 1b. Oracle database architecture 1c. Introduction to concept of SGA and PGA 1d. Oracle Control file 1e. Oracle instance	1.1 1.2 1.3 1.4 1.5	Definition of DBMS Benefits of DBMS Introduction to Database system, Overview of parallel DBMS, Distributed DBMS, Advantages of Distributed DBMS Oracle database architecture Logical structure, Physical structure System Global Area (SGA) Database	10

Unit	Major Learning Outcomes (in cognitive domain)		Topics and Sub-topics	Hours
			buffers cache, Redo log buffer, Shared pool	
		1.6	Program Global Area (PGA) Background processes, System Monitor (SMON), Processes Monitor(PMON), Database Writer(DBWR), Log Writer(LGWR), ARCHiver	
		1.7	Maintaining Control file. Use of control file, Control file, Multiplex and manage the Control file, manage control file with oracle managed files.	
		1.8	Managing an Oracle Instance. Create and manage Initialization parameter files, configure OMF, startup & shutdown an instance, monitor the use of diagnostic files	
Unit-II **Managing User, Objects, TableSpace and DB Security**	2a. To understand how to manage the users. 2b. To understand Managing Table Space 2c. Database Security: • To use the system privileges. • To use Revoking Privileges given.	2.1	Managing user in oracle, Privileges, System Privileges, Object Privileges, Granting Privileges, Granting Privileges when Grantee has been given GRANT Privilege, Revoking Privileges Given, Revoking Permissions Using the REVOKE Statement, Roles Modifying Existing User password, create and modify roles, Control availability of roles, remove roles, user predefined roles, display role information from the data Dictionary, Creating a DBA User.	10
		2.2	Creating table spaces, Table spaces, Oracle system table space, Create table space, Creating a table space using SQL plus creating regular and temporary tables, manage storage structures within a table, reorganize truncate, drop a table, purpose of undo data, automatic undo management different types of indexes and their uses creating, reorganizing and dropping indexes, get index, Information from the data dictionary.	
		2.3	Database Security, Goals of Database Security, Threats to Database Security, Types of Database Security Issues: Discretionary Access Control, Granting & Revoking Privileges, Audit Trail, Mandatory Access Control	
Unit-III **Database Backup and Recovery**	3a. To understand Database Backup concept with its important 3b. Basics of Recovery 3c. Understand Recovery	3.1	Introduction	09
		3.2	Database backup	
		3.3	Why plan backup?	
		3.4	Transaction logs	
		3.5	Importance of backup	
		3.6	Backup mechanism, Logging, Check points	

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	Techniques	3.7 Database Recovery concepts and terminology 3.8 Data storage 3.9 Causes of failure 3.10 Recovery Techniques: Deferred update, Immediate update, Shadow paging 3.11 Instance and media recovery structures, Oracle processes, memory structures and files related to recovery, importance of check points, redo log files and archived log files, instance recovery. 3.12 Oracle recovery manager overview and configuration. RMAN features, components, configuring RMAN.	
Unit-IV **Emerging Database Technologies and Application Development**	4a. Understanding Internet Database 4b. Multimedia database 4c. Mobile Database 4d. Understand client server architecture, two tier and three tier architecture	4.1 Internet Databases, Internet technology, World Wide Web technology, Advantages and disadvantages of web databases 4.2 Multimedia Databases, Multimedia sources, Multimedia database queries, Multimedia database applications 4.3 Mobile databases, Architecture of mobile databases, Characteristics of mobile computing, Mobile DBMS, Commercial mobile databases 4.4 Client - Server Architecture Partitioning on application 4.5 Database in a two tier architecture 4.6 Key consideration in three tier applications and its Benefits	10
Unit-V **Overview of Oracle Networking and performance tuning**	5a. Overview of oracle networking 5b. Oracle database Performance tuning	5.1 Networking overview and basic oracle net architecture with its components. 5.2 Tuning application design, tuning SQL, tuning memory usage, tuning data access, tuning data manipulation, tuning physical storage, reducing network traffic, using STATSPACK and the automatic work load repository, using STATSPAC tuning tools, alert log, background trace file, server generated alerts, user trace files.	09
TOTAL			**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Introduction to DBMS and Oracle	04	06	04	14
II	Managing User, Objects, Table Space and DB Security	04	04	12	20
III	Database Backup and Recovery	06	06	08	20
IV	Emerging Database Technologies and Application	08	04	02	14

184

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
	Development				
V	Overview of Oracle Networking and performance tuning	08	02	02	12
	TOTAL	**30**	**22**	**28**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I	Demonstration of Installation of Oracle Database Softwares.	02
2	I	Create a database with database configuration assistant.	02
3	II	Use enterprise manager to grant system and manage database user.	03
4	II	Use enterprise manager to grant system and object privileges.	03
5	II	Use enterprise manager to create alter and drop a table space	04
6	II	Use enterprise manager to create and manage roles and profiles	04
7	II	Create database objects and constraints using enterprise manager.	03
8	III	Run a whole database backup and back up the control file to trace with SQL plus and manage RMAN backups.	04
9	IV	Implementation of accessing database from a java program. Demonstrate application of dynamic web page.	04
10	V	Demonstrate a listener with database control, oracle net service alias and configure dynamic service registration.	03
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Show demonstration of Set a listener password with lsnrctl and creating a listener for external procedural calls
2. Study the RMAN with Configuration of RMAN and Create backup sets using RMAN and managing backups
3. Mini Project on any other topic.(Use Java to implement front end of Application)

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert lecture on Advance database technique, tools and security and its challenges
2. Prepare case study on Database security technique and database backup

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Oracle for Professionals	Sharnam Shah, Vaishali Shah	SPD
2	Modern Database Management	Jeffery A. Hoffer V. Ramash, Heikki Topi	Pearson
3	Database Systems	Shio Kumar Singh	Pearson
4	Oracle Database 11g DBA Handbook	Bob Bryla, Kevin Loney	Oracle Press
5	Oracle Database 11g OCP Certification All in one Exam	John Watson, Damir Bersinic	McGraw-Hill

B) Software/Learning Websites
1. http://www.oracle.com/technetwork/tutorials/index.html
2. http://www.oracle.com/technetwork/testcontent/index-091166.html
3. www.javacoffeebreak.com/articles/jdbc
4. http://www.tutorialspoint.com/listtutorials/oracle/1

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments	Specifications
1	Desktop Computer	PC Specifications to be followed: Processor: i3 or i5 RAM: 4 GB or better HDD: 1 TB SATA Graphics Card: 2 GB Monitor: TFT LCD OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate Multimedia Keyboard, Speaker Antivirus: User License for three year
2	LCD Projector	Display Type: LCD Light Output: 3200 Lumens
3	Oracle	Oracle 10 G 11G or Higher

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	H	M	H				M		M	M
CO2	M	M	M	M			M		L		M
CO3	H	M	M							M	M
CO4	H	M	M	M	M	M	L	L	L	M	M
CO5	M	M	M	M	M	M	M	M		M	M

H: High Relationship, M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : ASP.NET Technology (ASP)   **COURSE CODE :** 6540

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	04	07	03	Max.	80	20	100	--	25	25	150
					Min.	32	--	40	--	10	10	--

1.0 RATIONALE:

The primary objective of this course is to developed server-side web applications using.NET platform. It is essential to get hands on experience for developing internet applications. This will help students to acquire skills and attitude to work as web developer.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Explain features of server side scripting.
2. Explain ASP components and directives.
3. Develop database applications.
4. Develop dynamic web pages.
5. Understand ADO.NET and Manipulation.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Understand and Explain features of server side scripting.
2. Understand Asp Process, functions and Built-in ASP Objects
3. Indentify and use ASP components and directives for application development.
4. Use IIS for application development with.NET IDE
5. Develop stand alone and web applications with database interactivity
6. Develop dynamic web pages using built-in ASP objects and controls.
7. Understand and use ADO.NET and its Manipulation.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction to ASP**	1a. ASP Process Model 1b. Function in ASP 1c. ASP objects	1.1 Process Model of ASP 1.2 Different function in ASP 1.3 ASP objects --response, request, application, session, server, object context & other	06
Unit-II **ASP Components and directives**	2a. Global.asa file 2b. Lcid property 2c. Components 2d. Directives 2e. Transaction	2.1 Global.asa file. 2.2 Server side includes code page, enable sessions, language, lcid and transaction. 2.3 Components --Ad rotator, browser capabilities, content rotator, page counter, counters. 2.4 Directives --config, echo, exec, flastmod, fsize, include 2.5 ASP Transaction & Email: Transaction, Transactions Database Design, Email Sending, Web Page Creation	06

187

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-III **Accessing Database**	3a. ADO objects 3b. Forms 3c. Database Operations 3d. OLE	3.1 ADO object--connection, command, record set. 3.2 HTML forms & posting of data to server 3.3 Adding, Retrieving and updating data in database 3.4 OLE DB providers with ADO	08
Unit-IV **Introduction to ASP.NET**	4a. Introduction 4b. Architecture 4c. IIS 4d. IDE 4e. HTML Forms 4f. Controls	4.1 introduction to.NET Framework, Difference between ASP and ASP.NET 4.2 .NET Architecture 4.3 Introduction to IIS, What is web application? Why it is used? 4.4 ASP.NET IDE. 4.5 Creation of web forms. 4.6 Using web form controls.	08
Unit-V **ASP.NET objects and components**	5a. ASP Objects 5b. Scope 5c. Object creation 5d. Server components 5e. Global.asa file 5f. Application object 5g. Events 5h. Method and collection 5i. Session object 5j. Properties	5.1 ASP Objects • Request • Response. • Server. • Application. • Session. 5.2 ASP.NET scope, state, view state, post back and configuration. 5.3 Object creation: Scripting, Drive, folder, file. • How to use objects? 5.4 Server components: Ad rotator, Content linker, Browser 5.5 Capabilities. 5.6 Use and creation of global.asa file. 5.7 How to use Application object? 5.8 Events 5.9 Methods and collection 5.10 How to use session object: enabling and disabling of session. 5.11 Event, properties, methods, collection	12
Unit-VI **ADO.NET & Data Manipulation**	6a. ADO.NET in ASP.NET 6b. Server control	6.1 ADO.NET in ASP.NET • Connection. • Dataset and data reader. • Data table and Data row. • Web config introduction. • Binding data with data grid. • Accessing and manipulating data. 6.2 ADO.NET: Server control templates and Data binding techniques • Understand data access in.net using ADO.net • Understand various Server Control Templates available for 6.3 Data Binding like Repeater. • Data List and Data Grid Controls. • Detail View Control, Form View Control, Grid Controls.	08
TOTAL			**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Introduction to ASP	04	04	02	10
II	ASP Components and directives	04	04	02	10
III	Accessing Database	02	04	06	12
IV	Introduction to ASP. Net	04	02	02	08
V	ASP.NET objects and components	06	06	08	20
VI	ADO.NET & data manipulation	06	06	08	20
	TOTAL	**26**	**26**	**28**	**80**

Legends: R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

Sr.No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
1	I, II	Create a student registration form. print the data by using the Response and request object	08
2	I, II	Write a program to implement concept of session object.	04
3	II	Write a program to use server side includes	04
4	III	Write a program to make database connectivity in ASP	04
5	II, III	Design login form with validation in ASP	04
6	VI	Study of.NET framework	04
7	V	Design Registration form with validation of email address, date of birth, blank field, telephones and mobile numbers etc in.NET	08
8	V	Design mark sheet of student in the.NET frame work Application which sends email.	08
9	V	Application which sends emails.	04
10	VI	Using AD rotator create the advertisement	04
11	I to VI	Mini Project – Create project using Forms & Database connectivity and implement the Project in LAN successfully with each desktop. Steps -.NET Framework Installation, IIS Installation, Publish Web Application	12
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Discuss ASP.NET and similar technology available.
2. Prepare seminars on various topics ASP.NET.

189

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Concept will be introduced in lectures using charts or ppt.
2. Arrange expert seminar of industry person in the area of web development.
3. Develop mini project in practical sessions under the guidance of teacher.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	ASP.NET	Dave Mercer	Tata Mc Grow Hill
2	.NET Framework	Anthony Jones	Tata Mc Grow Hill
3	.NET Framework Essential	Thwan Thai, Hoang Lan	Oreilly

B) Software/Learning Websites
1. http://www.w3schools.com/aspnet/
2. http://www.tutorialspoint.com/asp.net/
3. http://www.asp.net/get-started

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments	Specifications
1	Desktop Computer	PC Specifications to be followed: Processor: i3 or i5 RAM: 4 GB or better HDD: 1 TB SATA Monitor: TFT LCD OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate Antivirus: User License for three year
2	LCD Projector	Display Type: LCD Light Output: 3200 Lumens

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	K
CO1	L	H	H	M			M				
CO2			H	M			L	M		M	
CO3		H		L	L						
CO4			M			L					
CO5		H	H	M			H	H		H	
CO6		M	H	H				M		L	L
CO7		M	H	H				M		L	L

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   :PHP Programming (PHP)   **COURSE CODE :**6541

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	04	07	03	Max.	80	20	100	--	25	25	150
					Min.	32	--	40	--	10	10	--

1.0 RATIONALE:

The course of PHP programming has been developed to facilitate acquisition of the open source programming language required in IT industry today. The course aims to improve the understanding of Open source programming language, Software and web application development. The program provides the requisite awareness and knowledge to understand key concepts that can be applied to IT projects focusing on Services provided by web application.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Describe the concepts of constants, variables, data types and operators
2. Develop programs using input and output operations
3. Develop program using different looping and branching statements.
4. Code & maintain small PHP web based applications
5. Introduce power of relational databases using MySQL
6. Examining the various aspects of security, from securing server, database server

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Knows the process of executing a PHP-based script on a web server.
2. Acquire the basic knowledge of PHP syntax for variable use and standard Language constructs, such as conditionals and loops.
3. State the syntax and use of PHP object-oriented classes
4. Develop a form containing several fields and be able to process the data provided on the form by a user in a PHP-based script.
5. Demonstrate the functions available to deal with file processing for files on the Server as well as processing web URLs.
6. Utilize the power of relational databases using MySQL.
7. Illustrate the various aspects of security, from securing server, database.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **PHP Fundamentals**	1a. Introduction to PHP 1b. PHP programming basics 1c. Recall operators and control flow statements	1.1 Introduction to PHP--Concept, PHP--Evolution 1.2 PHP Vs. Other Scripting Languages, PHP vs. ASP, PHP vs. JAVA, PHP vs. Perl. 1.3 PHP Installation--Operating System, Module or CGI, Web Server 1.4 PHP Program Basic-- File Basics, Statements, comments, Literals	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics		Hours
		1.5	Data Types, Variables, Constants, Scope of Variable.	
		1.6	Operators & Functions—General operations, String operations, String functions, Numeric operations--Bitwise, comparison, Logical operators, operator Precedence.	
		1.7	Program Flow Control, Structures, Conditional Statements--if, if--else, if--else ladder	
Unit-II **Arrays and Functions**	2a. Introduction to array and string function. 2b. Concept of Function.	2.1	Arrays: One Dimensional Arrays, Multidimensional Arrays, Initializing Arrays, Handling Array with Loops, PHP Array Function.	06
		2.2	Strings: String Function, Converting to String, Converting from String, Formatting Text Strings.	
		2.3	Functions Types: User Defined, Passed by Value, Passed by Reference. Built In Function, Variable Lifetime, Recursion	
Unit-III **OOP with PHP**	3a. Necessity of Oops approach with Basic terminologies 3b. Data security.	3.1	OOPS approach with PHP, Classes and Objects, Encapsulation, Inheritance, Polymorphism, Cohesion & Coupling	06
		3.2	Access to Properties & Methods, Public Access, Private Access, Protected Access	
Unit-IV **User input & Regular Expressions**	4a. Need of HTML forms 4b. Concept of Regular Expression.	4.1	Introduction to HTML forms	08
		4.2	Handling User Input With $_ GET[], $_POST[], $_REQUEST[].	
		4.3	Regular Expressions: Concept, use.	
		4.4	Types of Regular Expressions, Perl Compatible Expressions. Posix Regular Expression	
Unit-V **File Handling in PHP**	5a. Demonstrate Different File and Directory operations	5.1	Files Operations: Open, Close, Read, Write, Navigate, Copy, Delete, Rename. Determining file attributes	08
		5.2	Operations on Directory, Add, Delete, Read Directories	
		5.3	Uploading Files from Clients, Uploading Files with POST	
Unit-VI **ODBC and MYSQL**	6a. Introduction and necessity of Database 6b. Use of ODBC Database 6c. Use of MySQL 6d. Database Server	6.1	Introduction to Database	14
		6.2	Introduction to ODBC windows	
		6.3	Configuration of ODBC on windows, Connecting to the database, Manipulating Queries	
		6.4	Introduction to MYSQL, Connecting to the database, Manipulating Queries	
		6.5	Concept of Database, abstraction	
		6.6	Structured Query Language, Data Definition statements, Creating MySQL Database, Use creating table, describe, Alter Table, Drop table, Drop	
		6.7	Database, Data manipulation & Retrieval	

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		statements, Insert, Replace, Delete, Update, Select	
		6.8 PHP & Relational Databases PHP's MySQL interface, An online Library, Database Abstraction	
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
I	PHP Fundamentals	06	04	02	12
II	Arrays and Functions	04	04	02	10
III	OOP with PHP	06	04	04	14
IV	User input & Regular Expressions	06	02	04	12
V	File Handling in PHP	04	04	08	16
VI	ODBC and MYSQL	04	04	08	16
	TOTAL	**30**	**22**	**28**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I	Write a program to show the use of following operators used in PHP Arithmetic, Logical, Comparison, Relational	06
2	I	Write a program using switch case for following cases. - Factorial, Prime no, Even ODD, Positive/ Negative	06
3	II	Write a program use PHP built-in functions: Array functions, String Functions.	06
4	II	Write a program using function to find factorial of number using following function types: User defined functions with pass by value	06
5	II	Write a program to find a raise to b using passing by value with no return type	06
6	II	Write a program to find area & perimeter of Rectangle using passing by reference Function	06
7	III	Write a program to demonstrate use of inheritance.	06
8	IV	Write a program for following File operations: read, write operation	06

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
9	VI	Write a program for Employee management Using ODBC connectivity with Access	08
10	VI	Write a program for Database connectivity using MySQL	08
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Study of Procedural Oriented Programming vs. Object Oriented Programming.
2. Prepare a sample File System Applications with following details
   a. Online Storage Application,
   b. New User Registration
   c. Logging on
   d. Creating folders, Removing a folder
   e. Uploading files
   f. Logging off
3. Case Study on Various PHP frameworks.
   a. Word Press.
   b. Joomla.
4. Case Study on JavaScript Framework Jquery.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Demo lectures with power point presentations using LCD projector should be arranged to develop

9.0 LEARNING RESOURCES:

A) Books
Sr.No.	Title of Book	Author	Publication
1	Professional PHP4	Argerich, choi, Egervari	SPD, Calcutta
2	Programming php	Rasmuslerdurf	PHP
3	Learning php	David sklar	O'Reilly.

B) Software/Learning Websites
1. www.php.net
2. www.w3schools.com

C) Major Equipments/ Instruments with Broad Specifications
1. Software: Server-Apache Server
2. Editor: Sublime text 3.0
3. PHP Stack Softwares: EasyPHP (Version12.0), USB WebServer8.0, WAMP

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	M	H	M	M			H				
CO2	M	M					L				
CO3		H					L				L
CO4			L		M						M
CO5		H	H			L					M
CO6		H	H			L				H	H
CO7		H	H	M	H			H	M	M	H

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Mobile Computing and Application Development (MCD)   **COURSE CODE :** 6542

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	04	07	03	Max.	80	20	100	--	25	25	150
					Min.	32	--	40	--	10	10	--

1.0   RATIONALE:

This course is introducing the core concepts of mobile network with Mobile Application Development. It also includes the Mobile Application Development with Open source Operating system like Android OS.
Learning this course would improve the employment potential of students in the software development especially Mobile application development.

2.0   COURSE OBJECTIVES:

The student will be able to,
1. Describe Mobile computing concepts
2. Work with android application development and its structure
3. Use concepts of layout, GUI and design in Application development
4. Use event and exception handling for application development
5. Working with menus, application launching and working with database

3.0   COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Explain functioning of different mobile technology
2. Demonstrate Android activities life cycle
3. Execute operations on GUI objects
4. Perform Event driven programming
5. Apply various techniques on working with menu

4.0   COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics		Hours
Unit-I **Introduction to Mobile Computing**	1a. Explain brief Introduction to Mobile technology and generations 1b. Define and explain characteristics of GSM and CDMA 1c. Explain services and architecture of GSM AND Mobile Computing 1d. Explain characteristics, Application & Security issue of Mobile Computing 1e. Explain Middleware and Gateway for Mobile	1.1	Concept of Mobile Communication	10
		1.2	Different generations of wireless technology	
		1.3	Basics of cell, cluster and frequency reuse concept	
		1.4	Noise and its effects on mobile	
		1.5	Understanding GSM and CDMA	
		1.6	Basics of GSM architecture and services like voice call, SMS, MMS, LBS, VAS	
		1.7	Different modes used for Mobile Communication	
		1.8	Architecture of Mobile Computing(3 tier)	
		1.9	Design considerations for mobile computing	

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	Computing 1f. Explain Mobile IP and mobile Communication Protocol 1g. Introduction to Mobile computing through telephony	1.10 Characteristics of Mobile Communication 1.11 Application of Mobile Communication 1.12 Security Concern Related to Mobile Computing 1.13 Middleware and Gateway required for mobile Computing 1.14 Making Existing Application 1.15 Mobile Enable 1.16 Mobile IP 1.17 Basic Mobile Computing Protocol 1.18 Mobile Communication via Satellite: Low orbit satellite, Medium orbit satellite, Geo stationary satellite, Satellite phones	
Unit-II **Introduction to Android**	2a. Analyze Open source mobile technology, Explain Basics of Application development 2b. Describe Framework, SDK, Emulation 2c. Explain Android Application structure	2.1 Overview of Android 2.2 What does Android run On – Android Internals? 2.3 Android for mobile apps development 2.4 Environment setup for Android apps Development 2.5 Framework - Android- SDK, Eclipse 2.6 Emulators – What is an Emulator / Android AVD? 2.7 Android Emulation – Creation and set up 2.8 First Android Application	10
Unit-III **Android Activities and GUI Design Concepts**	3a. Explain Android Activities lifecycle and UI Layout 3b. Explain Expressions, Manifest, other necessary UI concept 3c. List and explain GUI Objects, 3d. Explain Layout Design concepts	3.1 Design criteria for Android Application: Hardware Design Consideration, Design Demands For Android application, Intent, Activity, Activity Lifecycle and Manifest 3.2 Creating Application and new Activities 3.3 Simple UI -Layouts and Layout properties: Introduction to Android UI Design, Introducing Layouts 3.4 XML Introduction to GUI objects viz.: Push Button, Text / Labels, Edit Text, Toggle Button, Padding	09
Unit-IV **Advanced UI Programming**	4a. Explain Android Event driven Programming, Activity Lifecycle, Explain Exception handling	4.1 Event driven Programming in Android (Text Edit, Button clicked etc.) 4.2 Activity Lifecycle of Android	09
Unit-V **Toast, Menu, Dialog, List and Adapters**	5a. Demonstrate working with menu and dialog, Themes, Dialog 5b. Perform Demo Application Launching 5c. Perform Database	5.1 Menu: Basics, Custom v/s System Menus, Create and Use Handset menu Button (Hardware) 5.2 Dialog: Creating and Altering Dialogs 5.3 Toast: List & Adapters 5.4 Demo Application Development and	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	operation	Launching	
		5.5 Basic operation of SQLite Database	
		5.6 Android Application Priorities	
TOTAL			**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Introduction to Mobile Computing	04	08	08	20
II	Introduction to Android	04	08	02	14
III	Android Activities and GUI Design concepts.	04	04	08	16
IV	Advanced UI Programming	02	06	04	12
V	Toast, Menu, Dialog, List and Adapters	08	08	02	18
	TOTAL	**22**	**34**	**24**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	II	Installation and setup of java development kit(JDK), setup android SDK, setup Android IDE, setup android development tools (ADT) plugins, create android virtual device	06
2	II	Create "Hello World" application. That will display "Hello World" in the middle of the screen using TextView Widget in the red color	08
3	III	Create application for demonstration of android activity life cycle	06
4	III	Create Registration page to demonstration of Basic widgets available in android.	06
5	III	Create sample application with login module.(Check username and password) On successful login, Chnage TextView "Login Sucessful" and on failing login, alert user using Toast "Login fail"	08
6	III	Create an application for demonstration of Relative and Table Layout in android.	06
7	IV	Create an application that will Demonstrate Button onClick() Event and change the TextView Color based on button Clicked	04
8	IV	Create an application that will get the Text Entered in Edit Text and display that Text using toast (Message).	04

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
9	V	Create an UI such that, one screen have list of all the types of cars. On selecting of any car name, next screen should show Car details like: name, launched date, company name	08
10	V	Create an application that will Demonstrate various database operations in Android	08
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Design sample GUI (Assume Suitable Details)
2. Prepare and Present presentation on different mobile technologies and on Open Source Technologies
3. Prepare comparison of technical features of different mobile communication technologies being used by popular service providers (such as VSNL, Reliance, Vodafone, Idea etc.) in your city/town

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert lecture on Android Development
2. Case study on latest technology in Mobile development
3. Case Study any real time Android application with Design and features

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Building Android Apps	IN EASY STEPS	McGraw-Hill Education
2	Professional Android 2 Application Development	Reto Meier	Wiley India Pvt. Ltd.
3	Beginning Android	Mark L Murphy	Wiley India Pvt. Ltd.
4	Pro Android	Sayed Y Hashimi and Satya Komatineni	Wiley India Pvt. Ltd.

B) Software/Learning Websites

1. http://www.tutorialspoint.com/android/
2. http://www.tutorialspoint.com/android/android_overview.htm
3. http://www.codelearn.org/android-tutorial/android-introduction
4. http://pl.cs.jhu.edu/oose/resources/android/Android-Tutorial.pdf
5. http://mobisys.in/blog/2012/01/introduction-to-android-sqlite-database/
6. www.appmakr.com/Android
7. www.telerik.com/android-development

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments	Specifications
1	Desktop Computer	PC Specifications to be followed: Processor: i3 or i5 RAM: 4 GB or better HDD: 1 TB SATA Monitor: TFT LCD OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate Antivirus: User License for three year
2	LCD Projector	Display Type: LCD Light Output: 3200 Lumens
3	Android SDK	Freeware

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1		H	H	H	M							M
CO2		M	M	M	M							M
CO3	H	M	M	M							M	L
CO4		M	M	M	M	M			M			L
CO5	M	M	M	L	M	M	M	M	M			M

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology (IF)
COURSE   : Data Mining and Big Data (DMB)   **COURSE CODE :** 6543

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.			Marks					
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	04	07	03	Max.	80	20	100	--	25	25	150
					Min.	32	--	40	--	10	10	--

1.0 RATIONALE:

This course is focusing the data mining foundations, various pre-processing techniques, built-in clustering algorithms and the essential components of decision support systems for the modern day industry and business. It also introduces principles, algorithm, architecture, design, applications and implementation of data mining. In addition commence the fundamentals of big data with Apache Hadoop and its applications.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Explore different techniques of data mining
2. Explore clustering of data with standard algorithms
3. Explore various web mining concepts of search engine
4. Relate data mining in real world application
5. Introduce Big Data Tools and applications

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Explain the Data mining and its process
2. Describe data cleaning and its important
3. Explain concepts of Web mining
4. Various applications of Data Mining in various fields
5. Recognize the importance of Big data and its use

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Data Mining Foundations**	1a. Basic Terminologies 1b. Web History 1c. Introduction to Web and data mining 1d. Basic Concepts of Association Rule 1e. Basics of Apriori algorithm 1f. Steps in Data mining process	1.1 What is the World Wide Web? 1.2 A Brief History of the Web and the Internet: Web Data Mining, What is Data Mining?, What is Web Mining?, Web structure mining, Web content mining, Web usage mining 1.3 Basic Concepts of Association Rules: Support and Confidence 1.4 Apriori Algorithm concept 1.5 Data Mining Processing steps	10
Unit-II **Data Pre-processing, Data Warehousing**	2a. Why Pre-process the Data? 2b. Data Cleaning 2c. Data warehousing concept and architecture 2d. Classical Partitioning	2.1 Necessity of data pre-processing 2.2 Data cleaning as a process 2.3 Data cleaning: Missing Values 2.4 , Noisy Data, Data Cleaning as a Process 2.5 Basic Concept of Data warehousing	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
And Data Clustering	methods: k-Means and k-Medoids.	and it's architecture 2.6 the need for data warehousing and its success 2.7 Concepts of K-means and K-medoids	
Unit-III **Web Mining**	3a. Information Retrieval and Web Search 3b. IR system 3c. Types of Queries 3d. TF-IDF 3e. Use Precision, Recall and F1	3.1 Introduction to information retrieval 3.2 A general IR system architecture 3.3 Types of Queries: Keyword queries, Boolean queries, Phrase queries, Proximity queries, Full document queries, Natural language questions 3.4 Concept of TF-IDF 3.5 Relevance measure metrics: Precision, Recall and F1	10
Unit-IV **Data Mining Applications**	4a. Data Mining Applications	4.1 Data Mining for Financial Data Analysis, Retail Industry, Telecommunication Industry, Biological Data Analysis, Other Scientific Applications, Intrusion Detection	09
Unit-V **Preface to Big Data**	5a. Introduction to Big data 5b. What is Big data? 5c. Introduction to Apache Hadoop: its architecture 5d. The Application of Big data	5.1 Introduction to Big data scenario 5.2 Concept of Big data 5.3 Hadoop technology and its architecture 5.4 Domains of Big data application	09
TOTAL			**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Data Mining Foundations	04	08	08	20
II	Data Preprocessing, Data Warehousing And Data Clustering	04	08	06	18
III	Web Mining	04	08	02	14
IV	Data Mining Applications	02	02	04	08
V	Preface to Big Data	04	08	08	20
	TOTAL	**18**	**34**	**28**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if

*these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I	Study assignment on data mining basic concepts	06
2	I	Assume set of transactions T with certain attributes. Calculate support and confidence for any two association rules	08
3	I	Study and understand various features of Weka Tool	08
4	II	Study of Data warehousing concept, architecture and its applications	06
5	II	Assume set of data object located in space. Create 3 Clusters (k=3) of data objects using k-means and k-medoids. Show details of algorithm tracing.	06
6	III	Study TF-IDF weighting calculation with suitable example.	08
7	III	Case study of Google search engine with various query types.	04
8	IV	Study of any one data mining application in detail.	06
9	V	Study experiment on Hadoop Technology.	06
10	V	Study map-reduce operations by assuming certain data set for processing	06
TOTAL			**64**

7.0 STUDENT ACTIVITIES:
Following is the list of proposed student activities like
1. Study fundamentals of R language (Prepare at least 3 basic level R language programs)
2. Case study on Big data application from any specific industry e.g. Telecommunication industry

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Arrange expert lectures by IT experts working professionally in the area of data mining and warehousing.
2. Custom excel dataset can be created which can be used for data mining.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Data Mining: Concepts and Techniques	Jiawei Han	Morgan Kaufmann Publishers
2	Web DataMining	Bing Liu	Springer
3	Big Data Now	--	O'Reilly Media

B) Software/Learning Websites
1. http://www.cs.waikato.ac.nz/ml/weka/
2. http://www.tutorialspoint.com/data_mining/
3. hadoop.apache.org
4. www.tutorialspoint.com/hadoop/

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments/ Instruments	Specifications
1.	Weka Tool	Open source Freeware

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	H	H	M			L				H
CO2	M	H	H	M						L	M
CO3	H	H	H	M						L	M
CO4	H	H	M	L							M
CO5	H	H	H	M							H

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Advanced Java (ADJ)   **COURSE CODE :** 6544

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	04	07	03	Max.	80	20	100	--	25	25	150
					Min.	32	--	40	--	10	10	--

1.0 RATIONALE:

In the current era of networking, online transaction processing and managing the dataflow over network becomes an important issue. This course is essential for providing knowledge and hands on experience over the issues of managing data on web, developing powerful GUI based friendly user interface, server side programming and developing applications for communication over network using object oriented fundamentals. Advanced Java enhances the Java programming. After learning this course, the student will be able to develop standalone/network/web based software projects required in curriculum as well as industry

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Develop applets, Frames using awt and swing components.
2. Develop network based applications.
3. Perform CURD operation on database.
4. Develop server side programs.
5. Develop small desktop or web applications.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Design and Develop applets, Frames using awt and swing components.
2. Develop network based applications.
3. Use CURD operation in standalone and web applications.
4. Use server side programs for developing web applications.
5. Develop small desktop or web applications.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction to Abstract Window Toolkit (AWT) & Swings**	1a. Frame and Applet 1b. Describe AWT controls and Layout Managers 1c. Introduction to Swing	1.1 Component, container, window, frame, panel. Creating windowed programs & applets. 1.2 AWT controls & layout managers 1.3 Understanding the use of AWT controls: labels, buttons, checkbox, checkbox group, scroll bars, text field, text area 1.4 Understanding the use of layout managers: flowLayout, borderLayout, gridLayout, cardLayout, gridbagLayout, menubars, menus, dialog boxes, file dialog. 1.5 Introduction to swing, Swing features, MVC Architecture, Combo Boxes,	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics		Hours
			progress bar, Tabbed Panes, Scroll Panes, separator, tables, trees, toggle button.	
Unit-II **Event Handling**	2a. Introduction to Delegation Event Model 2b. Explain Event Listener Interfaces.	2.1	The delegation Event Model, Event sources, Event listeners, Event classes. The Action Event class, The Component Event class, the Container Event class, the Focus Event class, the Item Event class, the Key Event class, the Mouse Event class, the Text Event class, the Window Event class, Adapter classes, Inner classes	06
		2.2	Event listener interfaces, The ActionListener Interface, the ComponentListener Interface, the ContainerListener Interface, the FocusListener Interface, the ItemListener Interface, the KeyListener Interface, the MouseListener Interface, the MouseMotion Interface, the TextListener Interface, the WindowsListener Interface, the WindowFocusListener Interface	
Unit-III **Networking & Security**	3a. Basics of Networking 3b. Explain InetAddress Class 3c. Describe Sockets 3d. Explain URL class 3e. Security	3.1	Basics of Networking: Socket, IP, TCP, UDP, Proxy Server, Internet Addressing	08
		3.2	The InetAddress Class Factory methods, Instance methods	
		3.3	TCP/IP Sockets, Socket, Server Socket, methods	
		3.4	URL, URL Connection, http, URL Connection methods, creating & using TCP/IP client & server	
		3.5	Security with Java: Theoretical introduction to java security, secure coding guidelines for java programming language.	
Unit-IV **Interacting with Database**	4a. Explain Connecting JDBC-ODBC	4.1	JDBC, ODBC, & Other APIS, JDBC two tier & three tier models, connecting to Database. Driver Interface, Driver Manager Class, Connection Interface, Statement Interface, the java.sql.package. Establishing connection & retrieving information Resultset. Interface, CRUD operations using JDBC	10
Unit-V **Servlets & JSP**	5a. Introduction to Servlet 5b. Describe Session and Cookies 5c. Introduction to JSP 5d. Describe RMI and EJB	5.1	Basics of Web applications, use of tomcat server, Type of Servlet, Servlet life cycle, Using servlets, handling request and response.	14
		5.2	Basic concepts of sessions, cookies & session tracking,	
		5.3	JSP introduction, life cycle of JSP, scriptlet tag, expression tag, declaration tag, Implicit Objects, Directives, Action Elements, JSP Expression language, JSTL,	

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		JSP custom tags. 5.4 Introduction to RMI, Introduction to EJB	
		TOTAL	**48**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Introduction to Abstract Windowing Toolkit(AWT) & Swings	06	06	04	16
II	Event Handling	02	04	04	10
III	Networking & Security	06	04	04	14
IV	Interacting with Database	04	04	08	16
V	Servlets & JSP	04	08	12	24
	TOTAL	**22**	**26**	**32**	**80**

Legends: R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hours
1	I	Write a program to design a form using the components textfield, label, checkbox, button and list.	04
2	II	Write a program to design a calculator using Java components and handle various events related to each component and apply proper layout to it.	04
3	I, II	Write a program to create a menu bar with various menu items and sub menu items. Also create a checkable menu item. On clicking a menu Item display a suitable Dialog box.	04
4	I	Write a program using swing to display a JcomboBox in an applet with the items – cricket, football, hockey, tennis	04
5	I	Write a program to create. -Jtree -JTable	04
6	II	Write a program making use of Adapter class.	04
7	III	Write a program to retrieve hostname--using methods in Inet Address class.	04
8	III	Write a program that demonstrates TCP/IP based communication between client and server.	04

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hours
9	IV	Write an Application program /Applet to make connectivity with database using JDBC, API	04
10	IV	Write an Application program/Applet to send queries through JDBC bridge & handle result.	04
11	V	Write a servlet for demonstrating the generic servlet class.	04
12	V	Create a web form which processes servlet and demonstrates use of cookies and sessions	04
13	V	Develop a simple JSP program for user login form.	04
14	V	Develop a simple JSP program to display the grade of a student by accepting the marks of five courses.	04
15	I to V	Mini Project	08
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Discuss different frameworks or tools for advanced java programming. E.g. spring, hibernate, windows builder in eclipse for standalone application etc.
2. Search and Use external jar files in your application.
3. Present your application and discuss various aspects of software e.g. security, efficiency, cost etc.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert seminar of industry person in the area of advanced java programming.
2. More focus should be given on practical work which will be carried out in laboratory sessions. If possible some theory sessions may be conducted in labs so that theory and practice can go hand in hand.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Complete reference	Herbert Schildt	Tata McGraw Hill
2	Unleashed java2 platform	Jamie Jaworkski	Techmedia
3	The Complete IDIOT's guide to JAVA2	Michale Morrison	Prentice Hall of India
4	Java Servlets	Karl Moss	Tata McGraw Hill
5	JSP a beginner's guide	Gray Bolinger and Bharti Natarajan	Tata McGraw Hill

B) Software/Learning Websites

1. http://www.oracle.com/technetwork/java/seccodeguide-139067.html
2. http://www.tutorialspoint.com/awt/
3. http://www.javatpoint.com
4. http://docs.oracle.com/javaee/5/tutorial/doc/bnafd.html

C) Major Equipments/ Instruments with Broad Specifications

Sr.No.	Equipments	Specifications
1	Desktop Computer	Processor: intel core i5, Memory: at least 4GB RAM Hard drive: at least 320GB hard disk
2	LCD Projector	Display Type: LCD Light Output: 3200 Lumens

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	H	H					L	L		
CO2		H	H	M							
CO3	M	H	H	M			M				
CO4	M	H	H	M		L					
CO5		H		H	L		M	H	M	H	L

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME   : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
COURSE   : Linux Operating System (LOS)   **COURSE CODE :** 6545

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
03	--	04	07	03	Max.	80	20	100		25	25	150
					Min.	32	--	40		10	10	--

1.0 RATIONALE:

Now a day's open source software movement is becoming noteworthy. This rapid evolutionary process produces better software than the traditional closed model, When programmers on the Internet can read, redistribute and modify the source for a piece of software, it evolves. People improve it, people adapt it and people fix bugs. And this can happen at a speed if Knowledge of recent trends and development in this area is kept updated.

Linux is an open--source operating system and to date the most dramatically successful open--source platform. Linux is very popular in education, Internet service applications, software development shops and (increasingly) in small businesses. Several successful companies market Linux and Linux applications.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Acquaint with recent trends and development in open source software development.
2. Install and implement Linux systems.
3. Implement Linux commands.
4. Implement Linux commands.
5. Write Programs using shell Programming.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Distinguish between various operating systems.
2. Evaluate the usefulness of Linux OS.
3. Identify use of various commands.
4. Distinguish between different types of shell.
5. Outline shell scripting.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction**	1a. Explain the basic aspects of Operating System. 1b. Describe how Linux was introduced to the world. 1c. Explain needs and benefits for studying Distributions. 1d. Explain difference between various OS 1e. Outline importance of	1.1 Review of operating system concepts 1.2 History of GNU Project 1.3 Open Source Software Movement and Linux Operating system 1.4 Various Distributions of Linux operating system and their features 1.5 Overview of Linux based Application softwares, programming languages, tools and utilities. 1.6 UNIX Vs Linux and MS--Windows Vs Linux. 1.7 Role of Linux system as server,	10

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	Linux as server.	workstation and desktop. 1.8 Applications of Linux Server	
Unit-II **Installation of Linux OS**	2a. Explaining how partition is done 2b. Outline the steps for installation of Linux OS. 2c. Explain startup & shutdown procedure of linux. 2d. Describe various file systems	2.1 Types of Partitions --Root partition, Swap partition and all other Linux Partitions, 2.2 Types of various file systems and their features. 2.3 Setting up disk partitions. 2.4 Partitioning tools-- Fdisk, Disk druid and Partition Manager. 2.5 Mounting file systems. 2.6 Installation of Linux -- Dual Booting. GRUB Boot--Loader. Creation of user accounts 2.7 System startup and shut down of Linux, Password Techniques & Shadow Password	10
Unit-III **General Overview of Linux File System**	3a. Understanding concept of X-Window and X-Server. 3b. Study of Desktop Environment.	3.1 I Node Structure, Concepts of X--window, X--server concepts. 3.2 Client--server Environment. 3.3 Desktop environment: KDE, GNOME – interfaces and tools. 3.4 General overview of Linux File system.	08
Unit-IV **Linux Commands**	4a. Describe linux terminal. 4b. Distinguish between various linux commands as per their use.	4.1 Entering and executing Commands. 4.2 File Manipulation commands, Directory Manipulation commands 4.3 Processes in Linux and their overall working and states, process control commands 4.4 General purpose commands, 4.5 Communication, Help commands.	10
Unit-V **Linux Shell Scripting**	5a. Distinguish between various shells. 5b. Explaining the basics of linux programming. 5c. Applying programming concepts for writing shell script	5.1 Different shells in Linux. Comparison between Different Shells. 5.2 Features and use of Bash shell. Shell scripting commands-- Read, echo, Looping, Decision making, operators, ending processes. 5.3 Writing simple shell scripts and Executing shell scripts	10
TOTAL			**48**

5.0 SUGGESTED\ SPECIFICATION TABLE WITH MARKS (THEORY)

Unit No.	Unit Title	Distribution of Theory Marks			
		R Level	U Level	A and above Levels	Total Marks
I	Introduction	08	04	04	16
II	Installation of Linux OS	04	08	04	16
III	General Overview of Linux File System	04	04	04	12
IV	Linux Commands	04	06	08	18
V	Linux Shell Scripting	04	06	08	18
	TOTAL	**24**	**28**	**28**	**80**

Legends: R = Remembrance (Knowledge); U= Understanding; A= Application and above

levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
1	II	Installing linux Operating System on PC.	06
2	III	Identify and use of the major desktop components of GNOME and KDE interfaces and their functions.	06
3	IV	Use of file and directory manipulation commands – ls, cd, pwd, dir, touch, cat, mkdir, rmdir, rm, mv, cp, head, tail, diff, comm, lpr, chmod,	08
4	IV	Use of text processing and communication commands – tr, wc, cut, paste, sort, grep, mesg, who, who am i,	08
5	IV	Use of general purpose and process commands-- ps exit, kill, bc, date, time, cal, clear, banner, su, man.	06
6	V	Write and execute two shell scripts using input--output statements/commands.	06
7	V	Write and execute two shell scripts using control loop.	06
8	V	Write and execute two shell scripts for file handling.	06
9	V	Write and execute two shell scripts using command line arguments.	06
10	IV	Executing commands like mail, smail, write, talk for sending electronic mails.	06
		TOTAL	**64**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Installing two distributions(RED HAT & UBUBTU) in lab and understanding the working of Linux on different GUI
2. Test cases that the student can run to verify that its implementation produce the expected result. Aims at increasing student's autonomy and confidence.
3. Problem solving: practice newly acquired knowledge by achieving programming challenges inspired from actual situations.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert lecture for understanding the importance of Linux over windows.
2. Arrange workshop for minimizing the difference between syllabus and industry working

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Mastering LINUX	Arman danesh	John Wiley & Sons (Asia) Pvt. ltd.
2	LINUX	Redhat	Tata McGraw—Hill
3	Guide to Linux Installation & Administration	Nicholos wells	Prentice Hall of India (vikas publication)
4	Linux system administration Handbook	Mark f komarenski	Tata McGraw—Hill (ptr/ph publication)
5	Yashwant Kanetkar	Unix Shell Programming	BPB

B) Software/Learning Websites
1. www.denett.com
2. www.tatamcgrawhill.com
3. www.phindia.com
4. www.wiley.com/college/silberschatz6e/0471417432/slides/ppt
5. www.en.wikipedia.org
6. www.computerworld.com
7. www.computer.howstuffworks.com
8. www.willamstallings.com/os4e.html
9. www.deitel.com/books/os3e/slides.html

C) Major Equipments/ Instruments with Broad Specifications
1. Computers with i3 processor configuration
2. Red hat Linux

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	H	M			M	H			M		M
CO2	H						L				
CO3	H	M				H		M			M
CO4		M	M		M				M		
CO5	H			M	M	H		M		M	M

H: High Relationship,   M: Medium Relationship, L: Low Relationship.

PROGRAMME : Diploma Programme in Information Technology(IF) / Computer Technology (CM)
COURSE : Network Administration and Management (NAM)   **COURSE CODE :** 6546

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
02	--	02	04	--	Max.	--	--	--	--	25	25	50
					Min.	--	--	--	--	10	10	--

1.0 RATIONALE:

It is an era of computers. In each and every field, computers are used for different applications. So, personal computer users have a need to connect their intelligent workstation to other computers for sharing peripherals such as printers with a user at another personal computer. The users may have a need to access data or execute applications software that resides on another computer. Again the user may need special processing capabilities that are only available on the other computer.

The task of connecting our stand--alone computers often requires a thorough knowledge of connectivity, hardware and software. It provides practical knowledge that will enable the students to get a connectivity job done quickly and easily so the students can get on with the applications and data sharing work they need to do.

This course is network application based course. It gives the practical knowledge of designing computer network while using any type of topologies. This course covers the installation and configuration of any network operating system. With the proper configuration of operating system on the server, the students will manage and administer the network resources or devices such as printers, scanner, driver and also software like files, folders, directories, applications, programs etc.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Compare different types of network.
2. Describe the different types of network directory services.
3. Design the computer network.
4. Configure the networking resources and software from the server.
5. Know the network management and administration.
6. Analyse different types of network technologies for internet connection.
7. Able to do Network management.
8. Troubleshoot and repair the network fault

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Remember basic hardware & software requirement for building a network
2. State the importance of Network operating System & Concept of Active Directory Services.
3. Configuration of DHCP and DNS.
4. Understand network administration and maintaining security.
5. Identify the different types of networks.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I	1a. Distinguish between various	1.1 **Network Related Jobs-** Network Administrator, Network Engineer,	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Exploring Directory Services and Remote Network Access.	types of Networks 1b. Configure the networking resources and software from the server. 1c. State the importance of Network operating System & Concept of Active Directory Services.	Network Architecture / Designer, Other Network Related Jobs. 1.2 **Directory Services-** Define Directory Services, Definition of Novell e-Directory, Windows NT domains, Microsoft's Active Directory, X500 Directory Access Protocol, Lightweight Directory Access Protocol, Forests, Trees, Roots and Leaves. 1.3 **Active Directory Architecture**- Object Types, Object Naming, Canonical Names, LDAP Notation, Globally unique identifiers, User Principle Names, Domain, Trees & Forests. 1.4 **Remote Network Access-** Need of Remote Network Access, Public Switched Telephone Network, Integrated Services Digital Network, Digital Subscriber Line, CATV. 1.5 **Virtual Private Network-** VPN Protocols, Types of VPNs, VPN Clients, SSL VPNs.	
Unit-II **Network Connection and Printing Services**	2a. Configure DHCP RARP and Internet Protocols 2b. Describe DNS, functions of DNS.	2.1 **Dynamic Host Configuration Protocol (DHCP)-** DHCP Origins, Reverse Address Resolution Protocol (RARP), the Bootstrap Protocol (BOOTP), DHCP Objectives, IP Address Assignment, DHCP Architecture. 2.2 I**ntroduction to Domain Name System(DNS)-** DNS Objectives, Domain Naming, Top Level Domains, Second Level Domains, Sub domains, DNS Functions, Resource Records, DNS Name Resolution, Resolves, DNS Requests, Root Name Servers, Resolving a Domain Name, DNS Name Registration. 2.3 **Understand Network Printing Concepts**- Understand Network Printing Concepts, Locally connected print devices, setting up local print devices, shared print devices, Sharing Locally Attached Print Devices, Describe Windows Network Printing, Add Print Wizard.	06
Unit-III **Implementation of Network**	3a. Describe transmission media. 3b. Explain types of wired media 3c. Describe types	3.1 **Designing Network:** Accessing Network Needs, Applications, Users, Network Services, Security and Safety, Growth and Capacity Planning, Meeting Network Needs- Choosing Network Type, Choosing Network	08

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
	of wireless media and cellular telephone 3d. Distinguish between wired and wireless media 3e. Configure and install windows 2003 server.	Structure, Choosing Servers. 3.2 **Installing and Configuring Windows 2003 Server**- Preparing for Installation, Creating windows 2003 server boot disk, Installing windows 2003 server, Configuring server/ client 3.3 **Setting windows 2003 server**- Creating Domain controller, Adding the DHCP and WINS roles, Adding file server and print server, Adding Web based Administration.	
Unit-IV **Administering Windows 2008Server (The Basics)**	4a. Create user accounts and apply account policies 4b. Explain Windows 2008. 4c. Manage the win 2008 security group. 4d. Manage database using window 2008 server backup software.	4.1 **Working With User Accounts**- Adding a User, Modifying User Account, Deleting or Disabling a User Account. 4.2 **Working With Windows 2008 Security Groups**- Creating Group, Maintaining Group Membership. 4.3 **Working with Shares**- Understanding Share Security, Cresting Shares, Mapping Drives. 4.4 Administering Printer Shares- Setting up Network Printer. 4.5 **Working with Windows 2008 Backup-** Using Windows 2008 Servers Backup Software	08
Unit-V **Web Server**	5a. Describe the concept of web server 5b. Explain IIS applications	5.1 concept of web server, IIS Applications	04
		TOTAL	**32**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):
Not Applicable

6.0 ASSIGNMENTS/PRACTICALS/TASKS:
The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* **Programme Outcomes/Course Outcomes in affective domain** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

S. No.	Practical Exercises (Any Five Visits and Five Reports/Assignments)	Approx. Hrs. required
1	Introduction Windows 2008 server	02

S. No.	Practical Exercises (Any Five Visits and Five Reports/Assignments)	Approx. Hrs. required
2	Creating Windows 2008 Server Boot Disk.	04
3	Installing Windows 2008 Server	04
4	Installing Active Directory	04
5	Creating AD Objects	04
6	Creating users and assigning rights. Setting security levels	04
7	Implementation of Remote Desktop using RDP(Remote Desktop Protocol) and TELNET	02
8	Installation of web server IIS	02
9	Installing and Configuring a Print server	02
10	Installation of DHCP server	02
11	Group of four students prepare a mini report on Latest Networking Technology	02
	TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Develop mini project report on latest network technology.
2. Collect information related to router, routing table and message transmission process.
3. Create user account and access permissions from server.
4. Design and demonstrate small LAN network in laboratory.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Industrial visit
2. Expert Lectures on Network Administration

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Computer Network	Hall Berg	Tech max
2	Introduction to Networking	Richard A. McMahan, Sir	Tata McGraw Hill Edition
3	The Complete Reference Networking	Craig Zacker	Tata McGraw Hill Edition

B) Software/Learning Websites
1. http://www.tutorial5.com/content/blogcategory/19/79/
2. http://www.pms.ifi.lmu.de/mitarbeiter/ohlbach/multimedia/IT/IBMtutorial/3376fm.html

C) Major Equipments/ Instruments with Broad Specifications
1. Windows server 2008 software.
2. Computers -HDD: 40GB Processor: PIV or above Min RAM: 2GB or above OS: 32 bit or 64 bit

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	H	i	j	k
CO1		m		H						H	M
CO2		M	M	M					L	M	M
CO3		M	H	H		H	L				
CO4		M	M	H	H	L	H	M			H
CO5		M	H	H		H			i	H	H

H: High Relationship, M: Medium Relationship, L: Low Relationship.

PROGRAMME   : Diploma Programme in Information Technology(IF)
COURSE   : Multimedia Technology (MLT)   **COURSE CODE** : 6547

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme				Examination Scheme								
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
02	--	02	04	--	Max.	--	--	--	--	25	25	50
					Min.	--	--	--	--	10	10	--

1.0 RATIONALE:

The Multimedia Techniques course is designed for using multimedia technology to enhance their professional skills and/or to pursue a career in multimedia. The course focuses on specialized technical and creative skills and provides students with critical reflective skills. It also offers students knowledge in theories and methodologies relevant to current industry professional practice and research. Student pursue career opportunities in multimedia post production, commercial television broadcast design, 2D and 3D animation, E-learning or digital education and graphic communications.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Formulate a working definition of interactive multimedia.
2. Demonstrate competence in using the authoring program Hyper Studio.
3. Demonstrate the use of animation, digitized sound, video control and scanned images.
4. Demonstrate the use of Netscape to access the Course Home Page and Tips and Tricks.
5. Develop conceptual maps of content and process for interactive multimedia instructional programs.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Import, Export and Edit the Images.
2. Create Animation and build Flash Movie.
3. Integrate Audio and video into a flash movie.
4. Build Text--Based Animation and Play Movie.
5. Integrate Multimedia in Web Page.

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Multimedia Elements**	1a. Differentiate multimedia input, output devices over traditional input, output devices. 1b. Evaluation of Multimedia systems and multimedia application. 1c. Interprets Storage media technology.	1.1 I/P, O/P devices: Input- Pen-Input, Image Scanner, Charge Coupled Devices, Digital Camera, Output, Display System Technology, CRT display System, Display Terminology. • Limitations: Traditional Input Device, Digital v/s Analog. 1.2 Evaluation of Multimedia systems. • Multimedia Elements: Facsimile, Document image, photographic image, Geographic's information system maps, Full motion and live video.	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		1.3 Multimedia Application: Document imaging, Image processing and Image Enhancement, OCR, Handwriting recognition, Non textual Image recognition, Full motion Digital Video application and Electronics message.	
		1.4 Storage media: Magnetic Media Technology, Hard disk Technology, RAID, Optical Media.	
Unit-II **Multimedia System Architecture and Audio, video Digitalization**	2a. Explore Multimedia System Architecture and review on Distributed Multimedia. 2b. Create animation using Multimedia tool. 2c. Evaluation of digital audio system. 2d. Identify the fundamental concept of color model in images and video.	2.1 Multimedia System Architecture. 2.2 Multimedia tool – Flash: Creating and Modifying elements, Line tool, fill/attributes, different shapes, text tools and pen tool, Selecting lines fill with arrow tool, selecting shapes, using lasso tool performing basic editing tools, selecting and deselecting elements, modifying created objects. 2.3 Basics of Digital Audio: Digitization of Sound, Signal-to-Noise Ratio (SNR), Signal-to-Quantization-Noise Ratio (SQNR) • MIDI: Musical Instrument Digital Interface, General MIDI, MIDI-to-WAV Conversion, Quantization and Transmission of Audio. 2.4 Color use in Image and Video: Color Science: Color Characteristics, Color Models in Images and Video. • Fundamental Concepts in Video: Types of Video Signals, Components of Video, Composite Video, S-Video, Analog Video, Digital Video, High Definition TV.	07
Unit-III **Compression / Decompression and File Formats**	3a. Identify Need, Types and Visibility Evaluation of Compression System 3b. Distinguish between Compression and Decompression. 3c. Evaluate different video Compression Technique.	3.1 Need, Types& Visibility Evaluating on Compression System: How much, Compression, How Good is Picture, How fast Does it Compress or Decompress, Redundancy and Usability. 3.2 Compression and Decompression: Types, Need of Data compression, Color gray Scale and Still Video Image. 3.3 Video Compression Technique: Simple Compression Technique, Interpolative, Predictive • JPEG Compression: Definition, JPEG Components, methodology of JPEG Standard. 3.4 File Formats: RIF, TIFF and RIFF	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		specifications. • MIDI file Format. • AVI File format, JPEG and MPEG: objectives and Architecture, MPEG2 MPEG4.	
Unit-IV **Multimedia Authoring and User Interface**	4a. Introductive study on Multimedia Authoring System and its type. 4b. Describe Hypermedia Application Design consideration. 4c. Explain Distributed multimedia system. 4d. Formulate Object Display / Playback Issues on 4e. Distributed Multimedia Systems.	4.1 Multi Media Authoring System and its types. 4.2 Hypermedia Application and Design consideration. 4.3 User Interface Design 4.4 Information Access. 4.5 Object Display / Playback Issues. 4.6 Distributed Multimedia Systems.	07
Unit-V **Distributed Multimedia Systems**	5a. Analyse the Components of Distributed Multimedia Systems. 5b. Describe Distributed Client Server Operation 5c. Explore Multimedia Object Server 5d. Overview on Multimedia Tool 5e. Recovery.	5.1 Components of Distributed Multimedia Systems 5.2 Distributed Client Server Operation 5.3 Multimedia Object Server 5.4 Multi Server Network topologies 5.5 Distributed Multimedia Databases 5.6 Multimedia Tool Recovery.	06
TOTAL			**32**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable (not theory paper)

Legends: R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: *Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* **Programme Outcomes/Course Outcomes in affective domain** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
1	I	Acquainting with the interface, tools and commands of either Flash or 3D--MAX or MAYA software	02
2	II	Draw seed & create small plant with use of at least 4 key frames.	02
3	II	Create a forest of tree with flowers & fruits from a small plant using different layers & frame transition time.	04
4	I&II	Create a forest of trees using the object created earlier. Also add lighting and rain effect.	04
5	II &III	Insert audio to relevant frames that has lighting & rain effect on a forest of tree was created as earlier.	04
6	III	Convert created work into file format, which can be published on web.	02
7	IV & V	Interfacing digital--web--cam, capturing live image & editing using web--cam software.	04
8	II & IV	Importing & exporting images in animation and apply different image editing tools.	02
9	II, III & IV	Create 1 min screensaver animation using key frames, importing images, audio and video files to more effect; Note: Students can also merge all exercise in it to more effective.	02
10		MINIPROJECT: Students should create a movie of minimum 2 minutes playtime using either Flash or 3D--MAX or MAYA software.	06
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like
1. Develop a MINIPROJECT for multimedia system.
2. Create Animation and Build Flash Movie
3. Create screensaver movie of minimum 2 min playtime using either Flash or 3D--MAX or MAYA software.
4. Create animation using different file formats.
5. Study and implement compression and decompression technique.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Showing Architecture and Issues for Distributed Multimedia System.
2. Arrange a company visit which progress 3 D MAX animations.
3. Arrange expert seminar of professor which belongs to Animation College.

9.0 LEARNING RESOURCES:

A) Books

Sr.No.	Title of Book	Author	Publication
1	Multimedia Computing, Communication and Application	R. Steimnetz, K. NaHourstedt	Pearson Education
2	Multimedia Systems Design	Prabhat K. Andheigh, Kiran Thakrar, John F	Prentice Hall of India
3	Multimedia Systems	Koegel Buford	Pearson Education
4	Micromedia Flash for Windows and Macintosh	Katherine Ulrich	Pearson Education
5	Multimedia Communication	Free Halshall	Pearson Education

B) Software/Learning Websites

1. www.Smartwebby.com
2. www.Cartoonsmart.com
3. www.dmxzone.com
4. www.sitepoint.com

C) Major Equipments/ Instruments with Broad Specifications

1. adobe flash player version 10.0.22.87
2. Autodesk 3ds Max 2015 software: System Requirement
3. Autodesk® Maya® 2016 software

Sr.No.	Equipments	Specifications
1	Desktop Computer	PC Specifications to be followed: Processor: i3 or i5 RAM: 4 GB or better HDD: 1 TB SATA Monitor: TFT LCD OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate Antivirus: User License for three year
2	LCD Projector Display	Display Type: LCD Light Output: 3200 Lumens
3	Adobe Flash Player	Version 10.0.22.87
4	Autodesk 3ds Max 2015	3D Animation tool

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1		L	H	H				M			M
CO2	M	M	H	H	L		M	L			M
CO3		H	H	H		M	M		L	L	L
CO4		H	H	H	L	M	M		L	L	M
CO5		H	H	H				L	M	M	M

H: High Relationship, M: Medium Relationship, L: Low Relationship.

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme					Examination Scheme							
Hrs / week			Credits	TH Paper Hrs.	Marks							
TH	TU	PR				TH	TEST	TH+TEST	PR	OR	TW	TOTAL
02	--	02	04	--	Max.	--	--	--	--	25	25	50
					Min.	--	--	--	--	10	10	--

1.0 RATIONALE:

The scope of Internet and Web Technology is increasing very fast, hence it is essential to develop the manpower in these areas. The learners shall be aware of various tools used in dynamic web page designing and hosting of websites. This course contains tools for developing web applications as well as desktop applications.

2.0 COURSE OBJECTIVES:

The student will be able to,
1. Knows about .NET framework.
2. Acquire the knowledge and features of VB.NET.
3. Create Window application using VB.NET
4. Describe polymorphism, Inheritance and object oriented concept used in VB.NET
5. Apply different file operation and serialization.

3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:
1. Acquires the knowledge of.NET framework.
2. Recognize the problem modeling approach with modularity using functions.
3. Develop the program by using object oriented techniques in VB.NET.
4. Develop application by using different control of VB.NET
5. Utilize the basics of file operations.
6. Create the crystal Report.
7. Create data driven application by using VB.NET framework and ADO.NET

4.0 COURSE DETAILS:

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Unit-I **Introduction to VB.NET**	1a. Introduction to the.NET frame work and Architecture 1b. Understand VB.NET Development Environment	1.1 Event Driven Programming 1.2 .NET as better Programming Platform 1.3 .NET Framework 1.4 .NET Architecture 1.5 The Just-In-Time Compiler 1.6 .NET Framework class library introduction 1.7 VB.NET Development 1.8 Environment. Creating Applications. 1.9 Building Projects. Using simple components. Running VB.NET applications.	04
Unit-II	2a. Study the features of	2.1 Features	04

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
Implementati on of VB.NET	VB.NET 2b. Study of core Program components of VB.NET.	2.2 VB.NET IDE 2.3 Data types 2.4 Operators 2.5 Loops 2.6 Control Structures 2.7 Cases 2.8 Procedures 2.9 Error Handling 2.10 Properties 2.11 methods and events	
Unit-III **Object Oriented Programming in VB.NET**	3a. Introduction to basic concept of object oriented programming 3b. Implementation of concept of oops in VB.NET	3.1 Introduction to OOP. Advantages & Disadvantages. 3.2 Basic Concept of OOP, Classes & Objects. 3.3 Constructors and Destructors. 3.4 Method overloading 3.5 Overloading and Overriding. 3.6 Inheritance and polymorphism 3.7 Access modifiers: - Public, Private, Protected, Friend. 3.8 Array 3.9 Interfaces 3.10 Exception Handling	04
Unit-IV **Windows Applications in VB.NET.**	4a. Introduction to different controls of VB.NET 4b. Create small and simple Window application.	4.1 Windows Forms 4.2 Controls: Text Boxes, Buttons, Labels, Check Boxes and Radio Buttons List Boxes, Combo boxes. Picture Boxes, scrollbars, 4.3 Splitters, Timer, menus, Built-in Dialogs, Image List, Tree Views, List Views, toolbars, Status Bar and Progress bars.	04
Unit-V **File handling & Serialization**	5a. Concept of file handling and Directory classes	5.1 File handling using File Stream, using Stream Writer, using Stream Reader, using Binary Reader 5.2 Binary Writer classes. 5.3 File and Directory Classes 5.4 Types of Serialization.	04
Unit-VI **Databases in VB.NET**	6a. Introduction to database and dataset 6b. Implementation of connection of database 6c. Concept of Data binding with different controls	6.1 Database, Connections, Data adapters, Datasets, Data Reader, 6.2 Connection to database with server explorer. 6.3 Multiple Table Connection. 6.4 Data binding with controls like Text Boxes, List Boxes, Data grid etc. 6.5 Navigating data source	06
Unit-VII **Crystal Report**	7a. Introduction to Crystal Report. 7b. Working with crystal Report	7.1 Connection to Database: Table, Queries, Building Report, Modifying Report 7.2 Formatting Fields and Object Header, Footer, Details, Group. 7.3 Header, Group footer, Summary	06

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics	Hours
		7.4 Working with formula fields, Parameter fields, Group, special fields 7.5 Working with Multiple Tables, SQL in Crystal Report, Report Temples	
		TOTAL	**32**

5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):
Not Applicable

6.0 ASSIGNMENTS/PRACTICALS/TASKS:
The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. required
1	I	Create a simple Console Application using VB.NET.	04
2	II	Create Windows Application using VB.NET controls.	04
3	III	Create Window Application using Class.	02
4	IV	Create Window Application using Built in Dialogs.	04
5	IV	Apply Interface on Windows Application Form.	04
6	V	Write program for File Handling.	02
7	VI	Create Window Application for Connected database.	04
8	VI	Create Window Application for Disconnected database.	04
9	VII	Create Crystal Report of your any window application.	04
		TOTAL	**32**

7.0 STUDENT ACTIVITIES:
Following is the list of proposed student activities like
1. Prepare a mini project by integrating all above practicals.

8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):
1. Demo lectures with power point presentations using LCD projector should be arranged to develop

9.0 LEARNING RESOURCES:

A) Books
Sr.No.	Title of Book	Author	Publication
1	Programming Microsoft Visual Basic.NET	Francesco Balena	Microsoft Press
2	The Complete Reference -Visual Basic.NET	Jefrey R. Shapiro	Osborne/McGraw Hill
3	Murach's VB.NET database programming with ADO.NET	Anne Prince and Doug Lowe	Murach

Sr.No.	Title of Book	Author	Publication
4	The Visual Basic.NET COACH	Jelf Salvage	Addison Wesley
5	Mastering Crystal Report	MCCOY Mastering	BPB Publication
6	Crystal Report – The Complete Reference	George Peck	Tata McGraw Hill

B) Software/Learning Websites
1. vb.net-informations.com/
2. www.tutorialspoint.com/vb.net/
3. www.dotnetspider.com

C) Major Equipments/ Instruments with Broad Specifications
1. **Hardware: Desktop Computer P-IV processor or higher, 40GB HDD**
2. Software: Visual Studio, MS Access, SQL server

10.0 MAPPING MATRIX OF PO'S AND CO'S:

Course Outcomes	Programme Outcomes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	L	H	H	H			L			L	
CO2		H	M	L	L					L	M
CO3		H	M	L		L			L	L	M
CO4		M	L	L	L					M	L
CO5		M	L	L							L
CO6			L				L		M		
CO7		L	H	H				M			M

H: High Relationship, M: Medium Relationship, L: Low Relationship.

Annexure : I

Rules for Registration and Examination

Important Rules of Registration for courses.

1. An eligible student must register to minimum three courses and maximum seven courses during each term.
2. While registering for a course at the beginning of a term, a student shouldn't have backlog of more than seven courses of any term as carried over due to failure or any other reason.
3. A student can register for a Project work only after acquiring minimum 100 credits.
4. A student will have to re - register for a course/s if he / she is detained from the course/s for any reason.

Important Rules regarding Registration for Examination

1. A student can register for examination of only those courses for which he has registered and kept term.
2. A student can register for examination for not more than 10 courses in one examination.
3. A student will have to re-register for examination of theory or Practical / oral of a course if he / she fails in examination.
4. A student will be allowed to re-register for examination in accordance with rules if he / she was eligible to appear for last Examination but he/ she failed to appear last examination for any reason.
5. A student will not be able to cancel his registration after he / she is Registered for examination

Other Important Rules

1. A candidate will be eligible for the award of diploma when he / she acquires the required number of credits for a Programme.
2. No candidate will be allowed to appear for examination of any course unless the Head of the Department certifies that
   2.1 Attended at least 75% of the prescribed lecture hours, tutorial hours, practical hours or any other kind of work and or assignment for the course as the case may be in conformity with the provision laid down in the course contents.
   2.2 Satisfactorily completed specified laboratory practical, term work prescribed in curriculum for the course.
3. No candidate will be permitted to reappear to any course of any examination in which he has once passed.

Standard of Passing
1. Theory, total of theory and periodic test, practical, oral and termwork examination shall be separate head of passing.
2. To pass examination of any course, a candidate must obtain a minimum of 40% marks in each head of passing prescribed for that course taken separately.

Periodic Test
1. Two periodic tests will be conducted during each term for the courses as per their examination scheme.
2. Average marks of the two period tests will be considered for each course separately.
3. Reappearing for the periodic test for improvement of marks is not allowed.

Term Work
1. Term work is a document submitted by the candidate consisting of report of site / field visit and / or laboratory work and / or drawing sheets / sketch books / jobs / model. Such term work shall be submitted before the end of academic term and it shall be satisfactory in the opinion of concern faculty member, Head of the Department and Principal of Institute.

Grace Marks
1. Grace marks shall be applicable if the rules of "standards of passing" are fulfilled.
2. The grace of maximum three marks will be given in either in "Theory marks", or "Periodic test" or "total of theory and periodic test marks", if it falls short by maximum three marks to pass a course.
3. The grace of maximum three marks shall not be applicable twice for the same course. i.e. for "theory" and "total of theory and periodic test" of same course.
4. The grace marks are not applicable to practical, oral, term work examination.

Award of Class

First Class with Distinction	:	70% or more
First Class	:	60% and above but less than 70%
Second Class	:	50 % and above but less than 60%
Pass Class	:	40% and above but less than 50 %

Annexure : II

Evaluation Scheme for Project

Term Work   **: Max. Marks : 50**   **Min. Marks : 20.**
Oral   **: Max. Marks : 50**   **Min. Marks : 20.**

Progressive Assessment

Name of the student: **Enrolment No.:**
Term : II / III ODD / EVEN
Programme: Information Technology
Course   **:** Project   **Code :** 6412   **Project Guide :**

Title of Project :

SN	Project Activities	Date / Week	Leader ship	Understanding	Observation &Accuracy	Contribution	Timely Completion	Total	Signature of Student	Signature of Guide	Signature of HOD
			5	5	5	5	5	25			
1	Formation of team & finalization of project	1									
2	Submission of synopsis : by each group	2									
3	Project activity plan	3									
4	Maintenance Project Diary	6									
5	Visits to Industries / Institutions / Market	7									
6	Collection of Data / Survey	9									
7	Analysis and Presentation of data.	10									
8	Pre submission seminar	13									
9	Presentation of Rough Work : hand written	14									
10	Final Project Report : Submission	15									
	Total by Internal : out of 250										

The Term Work : Convert the total given by internal to "out off 25".

Signature of Project Guide

Project assessment :

Term Work			Oral		
Internal	External	Total	Internal	External	Total
25	25	50	25	25	50

Committees

1. Governing Body (GB)

Sr. No	Name & Office Address	Governing Body Designation
1	**Shri. Pramod Naik** Joint Director, Directorate of Technical Education, M.S. Mumbai	Chairman
2	**Shri. Mahendra Kothari** Chairman, Maharashtra State Pipe & Allied Industry, D-5, MIDC Satpur, Nashik.	Member
3	**Shri. Ashok Katariya** Chairman, Ashoka Group of Companies, Ashoka House, Ashoka Marg, Nashik.	Member
4	**Dr. Ramesh Unnikrishnan** Regional Officer and Director, Regional Office, (AICTE) Regional Office, Western Region, Mumbai.	Member
5	**Shri. B. S. Joshi** The Joint Director, Industries, Regional Office, Nashik	Member
6	**Shri. V. D. Patil** Coordinator, NITTR-Bhopal Extension Center, Pune.	Member
7	**Shri. S. P. Wagh** Chairman, Consumer Grievances Redressal M.S.E. Dist.Co.Ltd, Nashik	Member
8	**Shri. Kishor Patil** Institute Of Career & Skills, 3, Adgaonkar plaza basement, ABB circle, Mahatma Nagar, Nashik-422007	Member
9	**Shri. Harishankar Banerjee** President, NIMA, MIDC, Satpur, Nashik.	Member
10	**Shri. F. A. Khan** Principal, Govt. Polytechnic, Aurangabad.	Member
11	**Shri. Manish Kothari** Chairman, Institution of Engineers Nashik Local Centre, Nahik.	Member
12	**Prof. Dnyandeo P. Nathe** Principal, Government Polytechnic, Nashik	Member Secretary

2. Board of Studies (BOS)

Sr. No.	Name & Office address	BOS Designation
1	**Shri. S. P. Wagh** Chairman, Consumer Grievances Redressal M.S.E. Dist.Co.Ltd, Nashik	Chairman
2	**Shri. Sunil Bhor** Project Management Consultant, 659/A wing second floor market, Shopping complex Dindori Road, Nashik.	Member
3	**Shri. Bhalchandra R. Patwardhan** Plot No.24, Atharva Raw House, Bhavik Nagar, Gangapur Road, Nashik-13.	Member
4	**Shri. Kishor T. Patil** Institute Of Career & Skills, 3, Adgaonkar plaza basement, ABB circle, Mahatma Nagar, Nashik-422007	Member
5	**Shri. Kishor Vyas** Digilog System Pvt. Ltd., 15, Shriram sankul, Opp. Hotel Panchavati, Vakilwadi, Nashik.	Member
6	**Shri. Chandrashekhar. B. Dahale** F1, Computer Service, No. 2, Sukhraj, Near Parijatnagar bus stop, Nashik 422005	Member
7	**Shri. M. M. Dube** Sr. Executive, Systems, M & Q, C-1, MIDC, Ambad, Nashik-10	Member
8	**Shri. Anant Tagare** Principal Engineer, Validation, Mahindra & Mahindra Ltd., R & D Centre, 89, MIDC, Satpur, Nashik-422007	Member
9	**Shri. Aaush Potdar** Director, Poddar Clothing Industries, Nashik.	Member
10	**Shri. Vijay Sanap** Architect & Consultant, Soham Constructions, Nashik.	Member
11	**Shri. Pramod U. Wayse** Deputy Secretary (T), MSBTE, Regional Office, Osmanpura, Aurangabad-431005.	Member
12	**Shri. P. T. Kadve** Principal, K.K. Wagh Polytechnic, Nashik.	Member
13	**Shri. R. N. Vaidya** HOD, Civil Engg., Govt. Polytechnic, Nashik.	Member
14	**Shri. S. R. Deshkukh** HOD, Civil Engg (II Shift), Govt. Polytechnic, Nashik	Member
15	**Dr. C. Y. Seemikeri** HOD, Mech. Engg., Govt. Polytechnic, Nashik.	Member
16	**Dr. Sanjay Ingole** HOD, Mechanical Engg (II Shift), Govt. Polytechnic, Nashik	Member
17	**Shri. J. B. Modak** I/C, HOD, Plastic Engg., Govt. Polytechnic, Nashik.	Member
18	**Shri. L. S. Patil** I/C, HOD, Elect. Engg., Govt. Polytechnic, Nashik.	Member

Sr. No.	Name & Office address	BOS Designation
19	**Shri. Yogesh Sanap** I/C, HOD, Info. Tech. & Comp. Tech., Govt. Polytechnic, Nashik.	Member
20	**Shri. A. S. Laturkar** HOD, Electronics and Telecommunication Engg., Govt. Polytechnic, Nashik.	Member
21	**Dr. S. D. Pable** HOD, Electronics and Telecommunication Engg (II Shift), Govt. Polytechnic, Nashik	Member
22	**Shri. T. G. Chavan** I/C, HOD, Automobile Engg., Govt. Polytechnic, Nashik.	Member
23	**Ms. T. J. Mithari** I/C, HOD, Dress Design & Garment Manufacturing, Govt. Polytechnic, Nashik	Member
24	**Ms. N. P. Adke** I/C,HOD Interior Design & Decoration, Govt. Polytechnic, Nashik	Member
25	**Shri. V. H. Chaudhari** I/C, Training & Placement Officer, Govt. Polytechnic, Nashik	Member
26	**Shri. G. G. Wankhede** Controller of Examination, Govt. Polytechnic, Nashik.	Member
27	**Shri. S. P. Dikshit** Lecturer in Civil Engg., I/C CDC, Govt. Polytechnic, Nashik	Member Secretary

3. Programme wise committee(PWC)

Sr. No.	Name & Office address	PWC Designation
1	**Shri. Y. B. Sanap** I/C, HOD, Information Technology Dept. Govt. Polytechnic, Nashik	Chairman
2	**Shri. Anurag Kenge** Director of Cyberedge Web Solutions Pvt. Ltd., 250, Amber Arcade, Kulkarni Colony, Sharanpur Road, Nashik.	Member
3	**Shri. Chandrashekhar. B. Dahale** F1, Computer Service, No. 2, Sukhraj, Near Parijatnagar bus stop, Nashik 422005	Member
4	**Shri. K. R. Khinde** HOD, Comp. Engg / Info. Tech. Dept. MET Polytechnic, Adgaon Nashik	Member
5	**Ms. R. D. Kalambe** Lecturer in Information Technology Dept. Govt. Polytechnic, Nashik	Member
6	**Shri. H. K. Nemade** Lecturer in Information Technology Dept. Govt. Polytechnic, Nashik	Member
7	**Ms. S. P. Dudhe** Lecturer in Information Technology Dept. Govt. Polytechnic, Nashik	Member
8	**Shri. Pramod U. Wayse** Deputy Secretary (T), MSBTE, Regional Office, Osmanpura, Aurangabad 431005.	Member
9	**Shri. S. P. Dikshit** Lecturer in Civil Engg. Incharge CDC, Govt. Polytechnic, Nashik	Member Secretary

4. PROGRAMME CURRICULUM DEVELOPMENT COMMITTEE

Institute Level Curriculum Development Cell

Sr. No.	Name of the Faculty	Designation
1	Prof. D. P. Nathe	Principal, Government Polytechnic, Nashik
2	Shri. R. N. Vaidya	Head of Civil Engineering Department and Academic co-ordinator, Government Polytechnic Nashik
3	Shri. S. P. Dikshit	CDC Incharge, Lecturer in Civil Engineering, Government Polytechnic, Nashik
4	Dr. N. L. Patil	Lecturer in Civil Engineering, Government Polytechnic, Nashik.
5	Dr. S. V. Bhangale	Lecturer in Electrical Engineering, Government Polytechnic, Nashik.
6	Dr. S. J. Gorane	Lecturer in Mechanical Engineering, Government Polytechnic, Nashik.
7	Shri. N. N. Thakare	Lecturer in Plastic Engineering, Government Polytechnic, Nashik.

Department Level Committee

Sr. No.	Name of the Faculty	Designation
1	Prof. D. P. Nathe	Principal, Government Polytechnic, Nashik
2	Shri. M. M. Goswami	I/C Head of Information Technology Department, Govt. Poly. Nashik
3	Shri. Y. B. Sanap	Lecturer in Information Technology, Government Polytechnic, Nashik.
4	Ms. R. D. Kalambe	Lecturer in Information Technology, Government Polytechnic, Nashik.
6	Shri. P. B. Mali	Lecturer in Information Technology, Government Polytechnic, Nashik.
5	Ms. N. S. Nikale	Lecturer in Information Technology, Government Polytechnic, Nashik.
7	Ms. S. P. Dudhe	Lecturer in Information Technology, Government Polytechnic, Nashik.

NITTTR Committee

Sr. No.	Name of the Faculty	Designation
1	Prof. R. G. Chouksey	Dean Student Welfare, Department of Vocational Education and Entrepreneurship Development, NITTTR, Bhopal.
2	Dr. Nishith Dubey	Professor, Department of Vocational Education and Entrepreneurship Development, NITTTR, Bhopal.

5. Contributors to Course Curriculum Development

Sr. No.	Name of the Faculty	Designation
1	Dr. A. R. Thete	Consultant. Director Center For Development of Leadership in Education Pvt. Ltd. Aurangabad.

Sr. No.	Name of the Faculty	Designation
2	**Information Technology Department, Government Polytechnic Nashik**	
	Shri. M. M. Goswami	I/C Head of Information / Computer Technology Department
	Shri. Y. B. Sanap	Lecturer in Information Technology
	Ms. R. D. Kalambe	Lecturer in Information Technology
	Shri. P. B. Mali	Lecturer in Information Technology
	Ms. N. S. Nikale	Lecturer in Information Technology
	Ms. S. P. Dudhe	Lecturer in Information Technology
3	**Civil Engineering Department, Government Polytechnic Nashik**	
	Dr. S. S. Pathak	Lecturer in Civil Engineering
4	**Mechanical Engineering Department, Government Polytechnic Nashik**	
	Shri. S. P. Muley	I/C Head of Mechanical Engineering Department
	Shri. R. V. Rupavate	I/C Head of Department (second shift)
	Shri. S. D. Sanap	Lecturer in Mechanical Engineering
	Dr. S. G. Gorane	Lecturer in Mechanical Engineering
	Shri. P. S. Kulkarni	Lecturer in Mechanical Engineering
	Shri. Y. S. Kokate	Lecturer in Mechanical Engineering
	Shri. A. G. Waghulde	Lecturer in Mechanical Engineering
	Shri. Prof. K. A. Jagtap	Lecturer in Mechanical Engineering
5	**Electrical Engineering Departments, Government Polytechnic Nashik**	
	Shri. L. S. Patil	I/C Head of Department
	Smt. D. R. Kirtane	Lecturer in Electrical Engineering
6	**E & TC Engineering Departments, Government Polytechnic Nashik**	
	Shri. A. S. Laturkar	Head of Department
	Shri. S. S. Prabhune	I/C Head of Department (II Shift)
	Dr. J. G. Joshi	Lecturer in E & TC Engineering
	Shri. D. B. Borude	Lecturer in E & TC Engineering
	Shri. M. D. Raut	Lecturer in E & TC Engineering
7	**Other Departments, Government Polytechnic Nashik**	
	Dr. K. V. Nemade	Controller of Examination, Lecturer in Automobile Engineering
8	**Science and Humanities Department, Government Polytechnic Nashik**	
	Shri. S. M. Shinde	Lecturer in Mathematics
	Mrs. A. S. Salunkhe	Lecturer in Mathematics
	Shri. C. N. Pagare	Lecturer in Chemistry

Sr. No.	Name of the Faculty	Designation
	Shri. S. A. Padwal	Lecturer in Physics
	Shri. R. P. Landage	Lecturer in English
	Mrs. A. N. Patil	Lecturer in Chemistry
	Mrs. Y. S. Patil	Lecturer in Physics
	Mrs. P. S. Joshi	Lecturer in English
	Mrs. K. S. Shinde	Lecturer in Chemistry
	Dr. Mrs. K. D. Talele	Lecturer in Physics

Certificate

The curriculum of the programme   has been revised in the year 2016, as per the provision made in curriculum development process of Government Polytechnic, Nashik. This is the **outcome based Curriculum of Diploma in Information Technology programme**, which shall be implemented from academic year 2016-17.

Verified by

Department Level CDC Representative
Government Polytechnic, Nashik

Head of Department
Information Technology
Government Polytechnic, Nashik

Incharge, Curriculum Development Cell
Government Polytechnic, Nashik.

Principal
Government Polytechnic, Nashik.