

Cusrow Wadia Institute of Technology, Pune-1

COMPUTER ENGINEERING DEPARTMENT

Multi Point Entry and Credit System 2014

CURRICULUM

[W. E. F. June 2014]

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE -1. CURRICULUM REVISION 2014

1. Preamble :

- Cusrow Wadia Institute of Technology, Pune was granted Academic Autonomy in the year 1985 by Government of Maharashtra vide letter No. PTI 2483/119915(234)/TE-I (B) dated 27/2/1985.
- Initially the Institute adopted the Model Curriculum prepared by then TTTI, Western Region, Bhopal. Subsequently, the revisions in the curriculum were made as per the needs of the Society.
- The Institute adopted Multi Point Entry and Credit System w.e.f. June 1998.
- The present curriculum has come into force w.e.f. June 2014 .
- The feedback was taken from various stake holders and it was strongly felt that with the rapid strides in the field of Information Technology, Computers and Manufacturing Processes, a dynamic curriculum need to adopt the benefits of the fast changing expectations in the contents as well as the Teaching Learning Methodology. As such, the present curriculum is being reviewed since 2012-2013. The observations are being noted down.
- The Institute has strengthened the hardware and software which is constantly consolidated and upgraded to match the needs of the society in general and the Industries in particular.
- Students should be proficient in the use of computers and related software irrespective of the branch of Engineering they are studying. The students shall be made to make maximum use of software packages and use Internet to derive and update their knowledge.
- The contemporary needs of the user system, more thrust on Learning Management System, Skill development and overall development of the students is the governing factor in the revision of 2014 curriculum.

2. Approach for Curriculum Revision:

- Scientific system approach will be adopted in the revision of curriculum .
- A curriculum revision model showing various steps, will be presented.
- Analysis of the existing curriculum is being done by taking feedback from the faculty implementing the curriculum, Alumni, Industry / Field Personnel, Courses Committee Members and the Experts in the field of Education.
- Entry behaviour of the students be assessed. Basic entry qualification for Diploma is SSC or equivalent .However, higher entry qualification like 12th Science, 12th MCVC, ITI etc. be also considered.
- Curriculum documents of MSBTE, other Boards and other Autonomous Institutions will be studied for inclusion of new courses and analysis of contents of existing and newly inducted courses and also the implementation strategy will be decided.
- The curriculum is to be rationalised as per the AICTE and MSBTE norms and guidelines. Recently, AICTE has designed a model curriculum and MSBTE also has revised its curriculum. However, these curriculums are designed by considering the needs at national / State level. As an Autonomous Polytechnic , our curriculum may be governed by local factors / needs.
- The team members will be identified for conducting Search Conference, collecting feedback from stake holders and interviews with Experts for noting the suggestions about the courses and necessary modifications. The Interactive Sessions are proposed to be arranged through Search Conference in which the Experts from Industry and Academia will be invited.

3. ROLES TO BE PLAYED AND FUNCTIONS TO BE PERFORMED BY A DIPLOMA HOLDER:

- A Diploma holder may be employed in the Industry as a Technician or Supervisor for Production, Installation, Repairs and Maintenance. He also may be employed in drawing, estimation or as an Assistant in IT related activities. He may be an Entrepreneur, be assigned a job of Purchase/ Marketing Department. Diploma holder should have basic knowledge of the various subjects of his branch in Engineering and also the related Inter-disciplinary subjects. He should be aware of the present technologies and be able to adopt the changes in future. He shall acquire the necessary skill sets in the Engineering subjects.
- His role in the Society is that of a responsible individual and should conduct himself as regards the values and cultures. He should acquire the necessary professional, presentation and managerial Skills.

4. ANALYSING JOB FUNCTIONS AND DERIVING CURRICULUM OBJECTIVES:

- The role of a Diploma holder, as a Technician on the job, is analysed in four domains of Professional Skills, Life Long Learning, Personal Development and Social Development.
- The curriculum should help the students to acquire professional skills and inculcate attitudes in order that the student will be able to discharge the role and functions effectively on the societal and employment front.
- Goals and objectives of each program are already framed in previous curriculum revision. The courses common to several programmes and the courses relevant to particular programmes were classified under various categories. Same categories may be considered in this revision.
- The overall course structure and Teaching Examination Scheme was prepared.
- The contents of various courses will be finalised by considering the feedback from stake holders through interviews, Search Conference and discussions.
- The course structure and the contents will be validated by the Courses Committees(PBOS).
- Study of the Diploma programmes offered by MSBTE, other State Boards and other Autonomous Institutions is being done to widen the perspective.

5. TEACHING LEARNING PROCESS:

- No. of weeks – 16 (Actually provided= 17-19/ term ,@36weeks) (2x4= 08 weeks for Exam.)
- Average days per week- 5.5 (Including Saturdays)
- No. of contact hours per day – 7
- No. of hours per week for instruction and pre-decided Co-curricular activities – 38.
- Each course shall be taught for sixteen weeks and two weeks shall be utilised for revision in that term.

6. Course Categories:

- Foundation(1)
- Core(2)
- Allied(3)
- Applied(4)
- Specialized(5)
- Number of courses for a programme – 38 – 41.
- Number of courses for award of class – 11
- Number of Elective courses - 4
- Number of credits to be earned for obtaining Diploma – 185.
- One credit is = one hour of lecture / practical per week for a course.
- Ratio of theory to practical hours per week : Approx. 50:50

7. EXAMINATION SCHEME:

- Theory paper – 80 marks
- Tests – 20 marks
- Term Work – 25-50 marks
- Practicals -25 – 50 marks
- Viva voce- 25 – 50 marks
- Project Work -100 + 50 marks
- Grand total – 4700 marks.
- Grand total of marks for award of class – 1600.

8. COURSE-WISE CONTENT DETAILING:

- For finalisation of course structure from Courses Committee(PBOS), Examination Committee and Board of Studies, various processes in the Curriculum Revision Model were followed. Also the documents of MSBTE and Autonomous Polytechnics were referred.
- Contents were decided by taking into consideration, the expectations of the stake holders, specific needs of Industry, Interviews , Discussions and Experts opinions .
- Every course has a unique code e.g. R14CP3405. ‘R14’ means the course is from the curriculum revised in 2014. CP implies Computer Engineering Department will teach this course. ‘3’ indicates that it is Core Course Category in the programme structure. ‘4’ means the course is to be taught to Computer Engineering programme. ‘05’ is the serial number of the course in Core Courses Category.

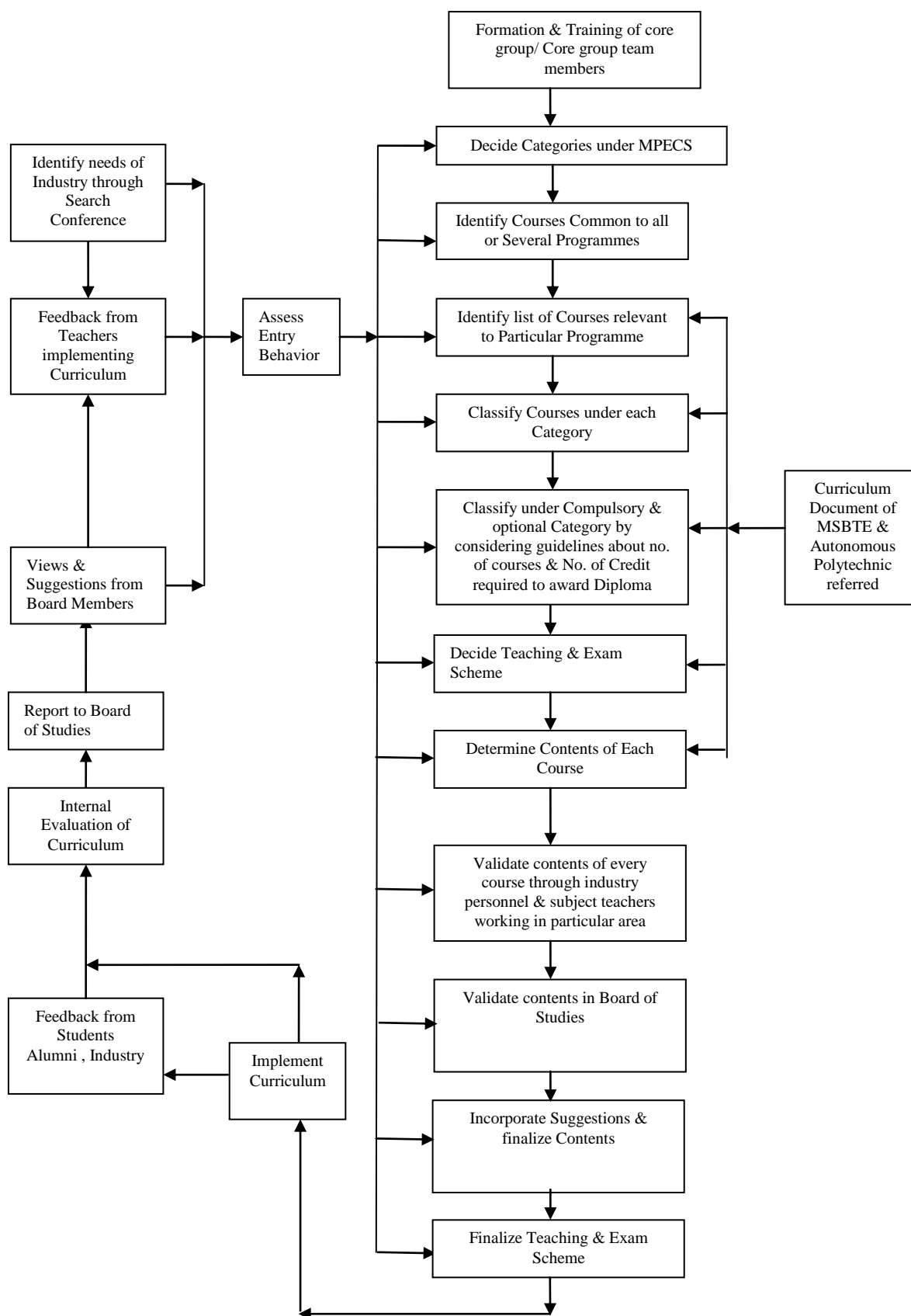
The 7th character in the above 9 digit code is assigned for the programme ,e.g. 1 – Civil, 2 – Mechanical, 3 – Electrical, 4 – Computer and 5 – Electronics & Telecommunication Engineering and 7 – Common courses for all programmes taught by Science Department.

- A rationale giving the importance of the course in the curriculum is vividly explained. The course objectives are derived indicating the purpose to teach the course / subject.
- The Practicals, Seminars are spelt out along with assessment technique .
- The input for professional practices and generic skills are included in most of the courses so that the students will be able to learn the contents beyond syllabus.
- The curriculum document prescribes learning resources for students e.g. Reference books, Textbooks, Websites, Handbooks, Printed notes etc.
- Use of Learning Management System, Audio Visual Aids be increased for enhancing the Teaching Learning Process.

9. CURRICULUM IMPLEMENTATION STRATEGY:

- Members of the faculty shall continuously undergo Induction Training Programme, Content upgrading programme conducted by ISTE , NITTTR and other Organisations.
- The faculty members will be deputed to attend Refresher courses and Training programmes so as to help them keep abreast with latest developments and technology.
- Faculty members will be trained in respect of various aspects and methods of evaluation systems , Paper setting etc.
- Faculty will be trained for monitoring the curriculum implementation.
- Library will be constantly modernised with additions of latest titles and books .The Library will have open access to the students. Library will be open for extended hours from 10 a.m. to 8.00 p.m. The Books Bank Facility will support the demand of the students.

- The Laboratory and Field Manuals will be structured and standardised so that the students can spend more time for doing practicals, understanding the significance, discussions and result analysis rather than only writing the journals.
- The Examination rules will be revised to suit the curriculum and will have similarity as regards to principles followed by MSBTE and other Examination bodies.
- The Evaluation Systems and marking schemes will be commensurate with the input hours and importance of the topics in the course.
- 24 X 7 Internet connection is available for faculty, staff and students . Also Wi-Fi connectivity provided in all classrooms and laboratories will support the modern methods of teaching.
- Uninterrupted Power Supply and captive power is made available to take over the load shedding .
- The laboratories , equipment and computers be maintained in working conditions. The models, charts and exhibits be displayed to invite attention of the students .
- Industrial visits, Field visits, Study tours shall be arranged regularly in a preplanned and structured manner so as to have focus on technical aspects.
- Guest faculty should be invited to deliver lectures on recent trends, technology, materials and processes . These activities be planned in the beginning of the term .
 - The students should imbibe various life skills, generic skills, learn stress management and adjust help and appreciate colleagues especially during group activities, study tours and visits etc



CURRICULUM REVISION MODEL USED AT CWIT- 2014

What is Computer Engineering?

Almost every facet of our life, whether in industry, academic institutes, government organizations, health care, research, or domestic life, is dependent on Computers.

A Computer Engineer design and develop the hardware and software systems that have made computers important part of our day to day life. They research, design, develop, test, and oversee the installation of computer hardware and software and supervise its manufacture. The educational program prepares them to address current and future problems in various fields.

Importance of Computer Engineering Program:

A Computer Engineer studies the whole computer system in its entirety, and is equally comfortable working with both hardware and software. He also understands how the hardware and software interact with each other. This ability to work on both sides of the hardware/software interface makes the Computer Engineer uniquely qualified to conceive, design, and integrate complete computer systems from scratch.

The Diploma program in Computer Engineering provides students with a strong theoretical and practical background in both the hardware and the software aspects of computer-based systems, along with the engineering analysis, design, and implementation skills necessary to work between the two. The curriculum is based on an engineering philosophy, with emphasis on both, the hardware and software.

Objectives of Computer Engineering Program:

The objectives of the Computer Engineering program is to educate students in the core topics as well as in a broad set of specialties of Computer Engineering, to impart students with professional attributes that characterize a well-schooled engineer and citizen. The department achieves this through a balance of required courses and judicious choices of technical electives in three stages of studies in Computer Engineering. The first teaches the students basic or foundation courses, the second teaches the core courses and the third teaches in depth some specialized areas of computer engineering through choices of technical electives taken during the junior and senior year. Our objectives are:

- the students will apply their knowledge and skills to succeed in a computer engineering career and/or obtain an advanced degree.
- the students will function ethically and responsibly,
- the students will apply basic principles and practices of computing to successfully complete hardware and/or software related engineering projects to meet customer objectives.
- the students will apply the basic principles and practices of engineering in the computing domain to the benefit of society.

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE – 411001
PROGRAMME : DIPLOMA IN COMPUTER ENGINEERING
SCHEME FOR MPECS 2014

Sr. No.	Category	Course Code	Course Title	Pre-requisite	G R P	C/ O	Teaching Scheme			Examination Scheme						
							L	P /T	Cre-dits	TH	TT	PR	OR	TW	TOTAL	
01	Founda- tion Courses	R14SC1701	Basic Mathematics			C	4	-	4	80	20	-	-	-	100	
02		R14SC1702	Engineering Mathematics			C	4	-	4	80	20	-	-	-	100	
03		R14SC1703	Basic Physics			C	2	2	4	40	10	-	-	25	75	
04		R14SC1706	Engineering Physics			C	2	2	4	40	10	-	-	25	75	
05		R14SC1707	Technical English			C	2	2	4	80	20	-	-	25	125	
06		R14SC1708	Communication Skills			C	1	2	3	-	-	-	@25	25	50	
07		R14ME1202	Engineering Graphic Skills			C	2	4	6	-	-	-	-	50	50	
08		R14CP1401	Computer Fundamentals			C	3	4	7	80	20	-	-	50	150	
09		R14EX1415	Electronic Devices & Comp			C	3	2	5	80	20	-	-	25	125	
		Total						23	18	41	480	120		25	225	850
10	Allied courses	R14ME2203	Industrial Org. & Management			C	3	-	3	80	20	-	-	-	100	
11		R14EE2304	Electrical Engineering			C	3	2	5	80	20	-	-	25	125	
12		R14ME2209	Workshop Practice			C	-	4	4	-	-	-	-	50	50	
13		R14EE2302	Marketing Management		A	O1	2	1	3	-	-	-	@25	25	50	
14		R14ME2208	Ele. of Accounts & Finance				2	1	3	-	-	-	@25	25	50	
15		R14ME2206	Entrepreneurship Development				2	1	3	-	-	-	@25	25	50	
16		R14CP2401	Environmental Studies			C	2	1	3	-	-	-	@25	25	50	
17		R14SC2701	Advanced Mathematics			C	3	-	3	80	20	-	-	-	100	
		Total						13	8	21	240	60		50	125	475
18	Core courses	R14CP3401	Programming in C			C	3	4	7	80	20	@25	-	50	175	
19		R14CP3402	Computer Organization	R14EX3415		C	4	-	4	80	20	-	-	-	100	
20		R14CP3403	Operating Systems	R14CP3402		C	4	-	4	80	20	-	-	-	100	
21		R14CP3404	Data Structures	R14CP3401		C	3	2	5	80	20	-	25	50	175	
22		R14CP3405	Object Oriented Prog.with C++			C	3	4	7	80	20	@25	-	50	175	
23		R14CP3406	Database Management Systems			C	3	4	7	80	20	25	-	50	175	
24		R14CP3407	Computer Networks			C	3	2	5	80	20	-	-	50	150	
25		R14CP3408	Microprocessors & Programming	R14EX3415		C	3	2	5	80	20	-	@25	50	175	
26		R14CP3409	Software Engineering			C	4	2	6	80	20	-	-	50	150	
27		R14CP3410	Data Communication			C	3	2	5	80	20	-	@25	50	175	
28	R14EX3415	Digital Techniques			C	3	2	5	80	20	-	-	50	150		
		Total						36	24	60	880	220	75	75	450	1700
29	Applied courses	R14CP4401	Web Design			C	1	4	5	-	-	50	-	50	100	
30		R14CP4402	Visual Basic Programming			C	1	4	5	-	-	50	-	50	100	
31		R14ME4402	Computer Aided Drafting			C	-	4	4	-	-	@50	-	50	100	
32		R14CP4403	Advanced C Programming	R14CP3401		C	3	4	7	80	20	@25	-	50	175	
33		R14CP4404	P. C. Maintenance	R14CP3402		C	4	2	6	80	20	-	-	50	150	
34		R14CP4405	Linux Operating System	R14CP3403		C	3	2	5	80	20	-	25	50	175	
35		R14CP4406	Project and Seminar	100 Credits		C	-	4	4	-	-	-	50	100	150	
		Total						12	24	36	240	60	175	75	400	950
36	Specialized courses	R14CP5401	Java Programming	R14CP3405		C	3	4	7	80	20	25	-	50	175	
37		R14CP5402	Multimedia Techniques			C	3	2	5	80	20	-	@25	50	175	
38		R14CP5403	Web Programming		B	O2	1	4	5	-	-	-	50	50	100	
39		R14CP5405	Animation Techniques				1	4	5	-	-	-	50	50	100	
40		R14CP5406	OS for Mobile Devices				1	4	5	-	-	-	50	50	100	
41		R14CP5407	Network Administration	R14CP3403			1	4	5	-	-	-	50	50	100	
42		R14CP5408	PHP Programming		C	O1	1	4	5	-	-	-	50	50	100	
43		R14CP5409	Ad. Computer Networks	R14CP3407			3	2	5	80	20	-	25	50	175	
44		R14CP5410	Micro Controllers	R14CP3408			3	2	5	80	20	-	25	50	175	
45		R14CP5411	Computer Security	R14CP3407			3	2	5	80	20	-	25	50	175	
46		R14CP5412	Advanced Java Programming	R14CP5401			3	2	5	80	20	-	25	50	175	
47		R14CP5413	OOMD	R14CP3405			3	2	5	80	20	-	25	50	175	
48		R14CP5414	Software Testing	R14CP3409			3	2	5	80	20	-	25	50	175	
		Total							11	16	27	240	60	25	150	250
	Grand Total						95	90	185	2080	520	275	375	1450	4700	

OVERALL SUMMARY:

Sr. No.	Category	No. of Courses		Teaching Scheme			Examination Scheme				
		Comp.	Opt.	L	P	Credits	TH+TT	PR	OR	TW	TOTAL
1	Foundation	9	-	23	18	41	600	-	25	225	850
2	Allied	5	1	13	08	21	300	-	50	125	475
3	Core	11	-	36	24	60	1100	75	75	450	1700
4	Applied	7	-	12	24	36	300	175	75	400	950
5	Specialized	2	3	11	16	27	300	25	150	250	725
Total		34	4	95	90	185	2600	275	375	1450	4700

Total Credits	: 185
Total Marks	: 4700
Total No. of Courses to complete the Program	: 38
Total No. of Theory Exams	: 27
Total No. of Practical / Oral exams	: 20
Theory credits to Non-Theory credits Ratio	: 51:49
Theory marks to Non-Theory marks Ratio	: 55:45

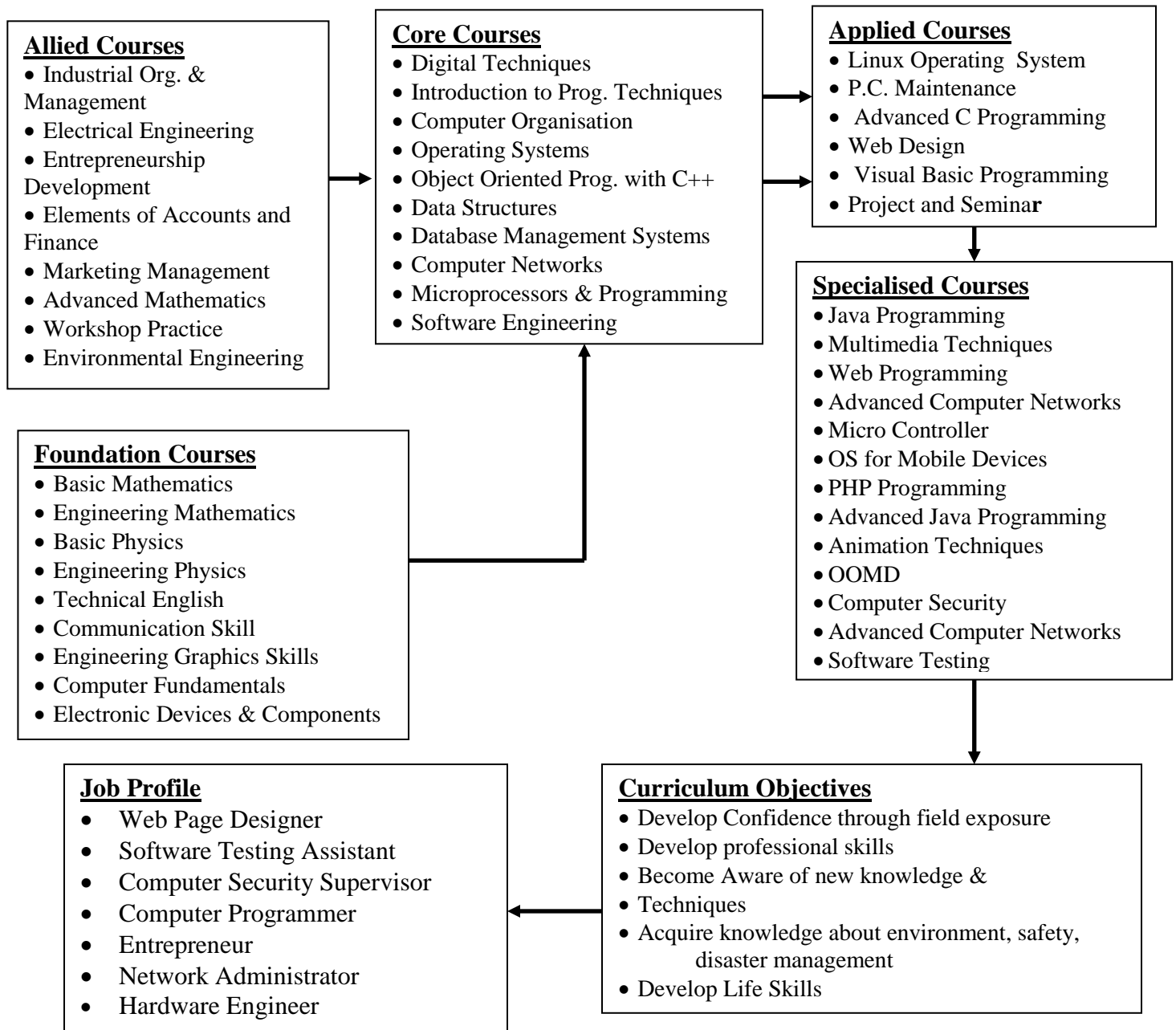
COURSES FOR CLASS DECLARATION :

NO. OF COURSES: 11 COMPULSORY COURSES: 8 OPTIONAL COURSES: 3

Category	Course Code	Course Title	Pre-requisite	Group	Comp/Opt.	L	P	Credits	Examination Scheme					Total
									TH	TT	PR	OR	TW	
Allied courses	R14ME2203	Ind. Org. & Management			C	3	-	3	80	20	-	-	-	100
Core courses	R14CP3407	Computer Networks			C	3	2	5	80	20	-	-	50	150
	R14CP3409	Software Engineering			C	4	2	6	80	20	-	-	50	150
Applied courses	R14CP4404	P. C. Maintenance	R14CP3402		C	4	2	6	80	20	-	-	50	150
	R14CP4405	Linux Operating System	R14CP3403		C	3	2	5	80	20	-	25	50	175
	R14CP4406	Project and Seminar	100 Credits		C	-	4	4	-	-	-	50	100	150
Specialized Courses	R14CP5401	Java Programming	R14CP3405		C	3	4	7	80	20	25	-	50	175
	R14CP5402	Multimedia Techniques			C	3	2	5	80	20	-	@25	50	175
	R14CP5403	Web Programming		B	ANY TWO	1	4	5	-	-	-	50	50	100
	R14CP5405	Animation Techniques				1	4	5	-	-	-	50	50	100
	R14CP5406	OS for Mobile Devices				1	4	5	-	-	-	50	50	100
	R14CP5407	Network Administration	R14CP3403			1	4	5	-	-	-	50	50	100
	R14CP5408	PHP Programming		C	ANY ONE	1	4	5	-	-	-	50	50	100
	R14CP5409	Ad. Computer Networks	R14CP3407			3	2	5	80	20	-	25	50	175
	R14CP5410	Micro Controllers	R14CP3408			3	2	5	80	20	-	25	50	175
	R14CP5411	Computer Security	R14CP3407			3	2	5	80	20	-	25	50	175
	R14CP5412	Advanced Java Prog.	R14CP5401			3	2	5	80	20	-	25	50	175
	R14CP5413	OOMD	R14CP3405			3	2	5	80	20	-	25	50	175
	R14CP5414	Software Testing	R14CP3409			3	2	5	80	20	-	25	50	175
	Total					28	28	56	640	160	25	225	550	1600

Max. Theory Marks	: 800
Max. Pract/Oral Marks	: 250
Max. Term Work Marks	: 550
Grand Total	: 1600
Theory Credits To Non-Theory Credits Ratio	: 50 : 50
Theory Marks To Non-Theory Marks Ratio	: 50 : 50

Link Diagram for Diploma in Computer Engineering :



INDEX

Sr. No.	Category	Course Code	Course Title	Page
01	Foundation Courses	R14SC1701	Basic Mathematics	12
02		R14SC1702	Engineering Mathematics	15
03		R14SC1703	Basic Physics	18
04		R14SC1706	Engineering Physics	21
05		R14SC1707	Technical English	24
06		R14SC1708	Communication Skills	27
07		R14ME1202	Engineering Graphic Skills	30
08		R14CP1401	Computer Fundamentals	32
09		R14EX1415	Electronic Devices & Components	36
10	Allied Courses	R14ME2203	Industrial Org. & Management	39
11		R14EE2304	Electrical Engineering	41
12		R14ME2209	Workshop Practice	45
13		R14EE2302	Marketing Management	47
14		R14ME2208	Elements of Accounts & Finance	49
15		R14ME2206	Entrepreneurship Development	51
16		R14CP2401	Environmental Studies	54
17		R14SC2701	Advanced Mathematics	57
18	Core Courses	R14CP3401	Programming in C	59
19		R14CP3402	Computer Organization	63
20		R14CP3403	Operating Systems	66
21		R14CP3404	Data Structures	69
22		R14CP3405	Object Oriented Programming with C++	73
23		R14CP3406	Database Management Systems	77
24		R14CP3407	Computer Networks	81
25		R14CP3408	Microprocessors & Programming	85
26		R14CP3409	Software Engineering	88
27		R14CP3410	Data Communication	91
28	Applied Courses	R14EX3415	Digital Techniques	94
29		R14CP4401	Web Design	97
30		R14CP4402	Visual Basic Programming	100
31		R14ME4402	Computer Aided Drafting	103
32		R14CP4403	Advanced C Programming	105
33		R14CP4404	P. C. Maintenance	108
34		R14CP4405	Linux Operating System	112
35		R14CP4406	Project and Seminar	115
36	Specialized Courses	R14CP5401	Java Programming	118
37		R14CP5402	Multimedia Techniques	122
38		R14CP5403	Web Programming	126
39		R14CP5405	Animation Techniques	130
40		R14CP5406	OS for Mobile Devices	133
41		R14CP5407	Network Administration	137
42		R14CP5408	PHP Programming	141
43		R14CP5409	Advanced Computer Networks	144
44		R14CP5410	Microcontrollers	148
45		R14CP5411	Computer Security	150
46		R14CP5412	Advanced Java Programming	154
47		R14CP5413	Object Oriented Modeling and Design	157
48		R14CP5414	Software Testing	160

DIPLOMA PROGRAMME IN: CIVIL/MECH./ELECT./COMP./E&TC. ENGINEERING

Course : Basic Mathematics

Course Code: R14SC1701

Course Category: Foundation

Credits : 4

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
4	-	3	80	20	-	-	-	100

Rationale:

Mathematics is an important prerequisite for the development and understanding of engineering concepts. The aim of the course is to acquire some essential competencies in Mathematics by the students of diploma in Engineering. The course will help the students to think logically and systematically. The students will develop the attitude of problem solving.

Objectives:

The students will be able to

1. Understand all the basic concepts of Mathematics used in various fields of engineering.
2. Know the methods and procedures of problem solving.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	<u>Trigonometry:</u> 1.1 Trigonometric ratios of an angle Definition of positive and negative angles. Unit of measurement of an angle. Signs of trigonometric ratios of an angle in the four quadrants.(ASTC RULE) Trigonometric ratios of negative angles. 1.2 Trigonometric ratios of compound angles. Trigonometric ratios of allied angles. Trigonometric ratios of multiple and sub-multiple angles. Factorization and de-factorization formulae.	15	16
2	Inverse Circular function 2.1 Definition of inverse circular function. Principal value of inverse circular function. Properties of inverse circular function. Simple problems based on properties. 2.2 Solution of triangle. Sine Rule. Cosine Rule. Solution of the triangle using sine and cosine rule. Determinant: 2.3 Definition of determinants. Problems on expansion of determinants of order 2 & 3. Solution of simultaneous equation in two and three unknowns (Cramer's Rule).	10	12

3	Matrices: 3.1 Definition of a Matrix. Types of Matrices. Algebra of matrices: Addition, subtraction and multiplication of matrices. 3.2 Transpose of a matrix. Cofactor matrix Adjoint of a matrix. 3.3 Inverse of a matrix and to find inverse by adjoint method. Solution of simultaneous equation by matrix method.	10	16
4	Statistics: 4.1 Measures of central tendency. Mean, Median and Mode for grouped and ungrouped data. 4.2 Measures of dispersion: Mean deviation. Standard deviation. Variance and coefficient of variation	10	12
5	Vector Algebra: 5.1 Definition of Vector. Addition, subtraction of vectors. Direction cosines, direction ratios of line. 5.2 Product of vectors and its properties: Dot product of vectors Cross product of vectors. Scalar triple product of vectors.	09	12
6	The Straight Line: 6.1 Slope and intercept of a line. Parallel and perpendicular lines. 6.2 Intersection of two lines. Acute angle between two lines Perpendicular distance between a point and a line. Distance between two parallel lines. 6.3 Graphs - Graph of linear function. Graph of quadratic equation. Graph of trigonometric function. Graph of exponential function.	10	12

Teaching Methodology: Chalk board, Discussion, Assignments, Printed notes

Skills to be developed:

Intellectual Skills:

- Memorizing skill will be developed after studying the formulae of all the topics.
- Selection skill will be developed after studying the methods of solving problems during selection of appropriate formula.
- Calculation skill will be developed after studying the topics Trigonometry, Determinants and Matrices

- Skill of drawing graphs will be developed after studying the topic graphs.

Learning Resources:

A) Books :

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Peter V. O'Neil	Advanced Engineering Mathematics	Thomson, Canada.
2	K. A. Stroud, D. J. Booth	Engineering Mathematics	Palgrave, New York, U.S.A.
3	S. L. Loney	Plane Trigonometry	Macmillan Publication

B) Websites for references:

1. www.Wikipedia.com
2. www.Wolfarm.com
3. www.Mathworld.com
4. www.nptel.iitm.ac.in

DIPLOMA PROGRAMME IN: CIVIL/MECH./ELECT./COMP./E&TC. ENGINEERING

Course : Engineering Mathematics
Course Category: Foundation

Course Code: R14SC1702
Credits : 4

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
4	-	3	80	20	-	-	-	100

Rationale:

Mathematics is an important prerequisite for the development and understanding of engineering concepts. The subject intends to teach students basic facts, concepts and principles of Mathematics as a tool to analyze engineering problems. It also aims to teach students to apply the basic facts of Mathematics to solve engineering problem.

Objectives:

The students will be able to:

1. Understand the concept and principles of derivatives, functions, limits.
2. Use the principles of derivatives for the various applications.
3. Understand the principles of complex numbers.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	Functions and Limits: 1.1 Definition of functions and Notation. Different types of functions. 1.2 Limits - Concept of limits, Algebra of limits. 1.3 Different methods of finding limits. Limits of algebraic function. Limits of trigonometric function. Limits of exponential functions.	15	16

2	Laws of Derivative: 2.1 Concept and definition of derivative. 2.2 Derivatives of standard functions. 2.3 Laws of derivatives :- Addition law. Subtraction law. Multiplication law. Division law. 2.4 Derivatives of composite functions (Chain rule).	09	12
3	Methods of Derivatives: 3.1 Derivative of parametric functions. Derivative of implicit functions. Logarithmic differentiation. 3.2 Concept of higher order derivative 3.3 Concept of partial derivative.	10	12
4	Application of Derivatives: 4.1 Geometrical meaning of derivative.(slope of tangent and normal to the given curve) 4.2 Radius of curvature. 4.3 Physical application of derivative. 4.4 Maxima and minima using derivative.	9	12
5	Integration: 5.1 Definition of integration as anti-derivative. 5.2 Integration of algebraic functions. 5.3 Integration of trigonometric functions. 5.4 Integration by substitution.	9	12
6	Complex Number: 6.1 Definition of complex number. Algebra of complex number i.e. addition, subtraction, multiplication and division of complex numbers. To express given complex number in $x + iy$ form. 6.2 Representation of complex number in a plane (Argand's diagram). Modulus and amplitude of complex number. Polar form of a complex number. Exponential form of a complex number. 6.3 Powers of a complex number - De - Moivre's theorem. Euler's theorem.	12	16

Teaching Methodology: Chalk board, Discussion, Assignments, handouts

Skills to be developed:

Intellectual Skills:

- Memorizing skill will be developed after studying the formulae of all the topics.
- Selection skill will be developed after studying the methods of solving problems during selection of appropriate formula.
- Application skill will be developed after studying the topic Application of derivatives.
- Comprehension skill will be developed after studying each and every topic.

Learning Resources:

A) Books :

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	K. A. Stroud, D. J. Booth	Engineering Mathematics	Palgrave, New York, U.S.A.
3	Peter V. O'Neil	Advanced Engineering Mathematics	Thomson, Canada.
4	Shanti Narayan	Engineering Mathematics Vol. I & II	S.Chand & Company, New Delhi.

B) Websites for references:

1. www.wikipedia.com
2. www.wolfarm.com
3. www.mathworld.com
4. www.nptel.iitm.ac.in

DIPLOMA PROGRAMME IN: CIVIL/MECH./ELECT./COMP./E&TC. ENGINEERING**Course Name : Basics Physics****Course Code: R14SC1703****Course category: Foundation****Credits : 4****Teaching and Examination Scheme:**

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
2	2	2	40	10	-	-	25	75

Rationale:

The development of various engineering topics is primarily based on the fundamental principles. The different principles of physics have a wide range of applications in all the branches of engineering. A reasonably good level of knowledge of physics, therefore, forms sound base for engineering students. Physics can be considered as a basic tool in the hands of an engineer through which he can pursue his studies and research work in technical field. The foundation level of the subject acquired by the student is kept in mind for selection of the topics. To create interest in the students more stress is given on the applications, in engineering field.

Objectives:

The student will be able to

1. Use different types of systems of units.
2. Identify and minimize the errors, Understand significant figures.
3. Study different types of motion and their applications in engineering field.
4. Study molecular forces and explain surface tension and viscosity with applications.
5. Understand different concepts of sound and ultrasonic waves with application.
6. Differentiate between conduction convection and radiation.
7. Use different types of thermometers.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	<p>1.1 Units and measurements: Unit, fundamental units & examples, derived units & examples, system of Fundamental units (C.G.S., M.K.S., S.I. system of units) Rules and Conventions for the use of spacing of symbols in SI system. Table of derived S.I. units. Multiples and sub multiples of units. Significant figures, rules for significant figures.</p> <p>1.2 Errors. – Types of errors, Minimization of errors, Percentage error, Propagation of errors, Numericals.</p> <p>1.3 Surface Tension: Molecular forces and their nature, cohesive forces, adhesive forces sphere of influence, definition of surface tension, factors affecting surface tension (Temperature, impurity nature of the liquid), concave and convex meniscus of liquid surfaces and their explanation on the basis of molecular forces,</p>	14	16

	angle of contact, capillary action and its explanation, applications of surface tension. Numericals 1.4 Viscosity: Streamline and turbulent flow of fluids, critical velocity, viscous force in fluid, significance of Reynolds's number, velocity gradient, Newton's law, Stoke's law expression, terminal velocity, Numericals.		
2	2.1 Circular Motion: Circular motion, uniform circular motion, tangential velocity, angular velocity, periodic time, frequency, relation between 1) Angular velocity and frequency, 2) angular velocity and periodic time, 3) linear velocity and angular velocity, radial acceleration expression, centripetal force, centrifugal force, numericals. 2.2 Applications of Circular Motion: Motion of a vehicle round a horizontal curve, banking of roads and tracks, expression for angle of banking and super elevation, centrifuge. numericals 2.3 Simple Harmonic Motion: Periodic motion, simple harmonic motion, S.H.M. as a projection of uniform circular motion, equation of S.H.M. graphical representation of S.H.M. concepts of oscillation, periodic time, frequency, amplitude, phase, phase difference. Numericals.	9	12
3	3.1 Modes of Heat Transfer, Temperature Measurement: Difference between heat and temperature, definition of calorie, absolute zero, units of temperature $^{\circ}\text{C}$, $^{\circ}\text{F}$, $^{\circ}\text{K}$ with their conversion a) Conduction – Flow of heat along a bar, steady state and variable state temp. Coefficient of thermal conductivity by Searle's method. (For good conductor) and Lee's method (for bad conductor). b) Convection, c) Radiation - Emissive power, absorptive power, black body, numerical Comparison between conduction, convection and radiation. 3.2 Temperature Measurement: Bimetallic thermometer, resistance thermometer, thermocouple & thermopile, Pyrometers – i) Ferry's total radiation, ii) Optical Pyrometer. 3.3 Sound: Sound waves, propagation of sound, reflection of sound waves, echo, absorption of sound, coefficient of absorption, reverberation, reverberation time, formula for reverberation time (No derivation), methods for controlling reverberation time. Numericals.	9	12

Teaching methodology: Chalk board, Group Discussions, Handouts, Question Bank, PPT, Transparency, Seminar, and Guest Lecture.

Term work:

Skills to be developed:

i) **Intellectual Skills:**

- Identify skill will be developed after studying topics of Temperature measurement.
- Discriminating skill will be developed after studying topics on motion.
- Comprehension skill will be developed after studying concept, principles laws and rules given in the syllabus.

i) Motor Skills:

- Measuring skill will be developed after completing practicals.
- Draw graph skill will be developed after studying practicals.
- Observing the result and comparison skill will be developed after competing practicals.

List of Experiments:

1. Measurement of (i) length, breadth and height of a block ,(ii) internal, external diameter and height of a hollow cylinder using vernier calipers of different least counts and digital vernier.
2. Measurement of diameter of sphere, wire and measurement of thickness of a plate by using micrometer screw gauge.
3. Measurement of radii of concave and convex surfaces and thickness of plate using spherometer.
4. To find viscosity of water by Poiseuille's method.
5. To find viscosity of oil by Stoke's method.
6. Calibration of thermocouple and to find unknown temperature.
7. Comparison of different thermometer with respect to mercury Thermometer.
8. To study the effect of length and mass of the bob on periodic time of a simple pendulum.
9. To investigate relation between radius and height of liquid in the capillary tube. (surface tension)
10. Determination of co-efficient of thermal conductivity of a good conductor by Searle's method.
11. Determination of co-efficient of thermal conductivity of a bad conductor by Lee's disc method.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	R.K.Gaur, S.L.Gupta	Engineering Physics	Dhanput Raj Publications.
2	Prof. M. P. Kurian, Prof. R. B. Birhade, Prof.A.A.Mokashi	Applied Physics	Reliable Publications.
4	Kamat & Rao	Applied Physics	Jeevan Deep Prakashan.
5	Mrs.V.C.Chinchwadkar	Text Book in Physics	Somaiya Publications, Bombay.

B) Web sites for references:

1. www.physicsclassroom.com
2. www.hyperphysics.com
3. www.physicsinfo.com

C) Video

www.Youtube.com (surface tension, viscosity, sound, ultrasound)

D) PPT

1. www.khanaacademy.com
2. www.slideshare.net

DIPLOMA PROGRAMME IN: CIVIL/MECH./ELECT./COMP./E&TC. ENGINEERING

Course : Engineering Physics

Course Code: R14SC1706

Course category: Foundation

Credits : 4

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
2	2	2	40	10	-	-	25	75

Rationale:

The development of various engineering topics is primarily based on the fundamental principles. The different principles of physics have a wide range of applications in all the branches of engineering. A reasonably good level of knowledge of physics, therefore, forms sound base for engineering students. Physics can be considered as a basic tool in the hands of an engineer through which he can pursue his studies and research work in technical field. The foundation level of the subject acquired by the student is kept in mind for selection of the topics. To create interest in the students more stress is given on the applications, in engineering field

Objectives:

The student will be able to

1. State the principle and measure the EMF by potentiometer.
2. Understand the concept of resistance and capacitance.
3. Study magnetic effect of electric current and apply right hand thumb rule.
4. Study effect of magnetic field on current carrying conductor and apply Fleming's left hand rule.
5. Differentiate magnetic materials and study their applications in engineering field.
6. Explain different terms related to lasers, its properties and application in engineering field.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	<p>1.1 Measurement of Resistance and EMF : Definition of charge, current, Potential difference ,specific resistance, color code for resistance, types of resistance, resistance in series & parallel combinations (numerical), concept of temperature dependence of resistance, thermistor, principle of potentiometer and balancing condition of potentiometer, potential gradient, measurement of EMF by potentiometer (numerical)</p> <p>1.2 Measurement of Capacitance: Capacitor & capacitance, units, capacitor in series and parallel combinations (numerical), applications of capacitor (air, solid dielectric, electrolytic)</p>	9	12

2	<p>2.1 <u>Magnetic Effect of Electric Current:</u> Magnetic effect of electric current, lines of induction due to a straight conductor; right-hand thumb rule, magnetic induction (direction and magnitude), concept of uniform field</p> <p>2.2 <u>Effect of Magnetic Field on Current Carrying Conductor:</u> Force of a magnetic field on current carrying conductor, (No derivation) Fleming's left-hand rule, couple acting on a rectangular coil placed in the uniform magnetic field, numerical</p> <p>2.3 <u>Magnetism:</u> Magnetic materials, permeability, susceptibility, relation between relative permeability and susceptibility, properties of diamagnetic, paramagnetic and ferromagnetic substances, ferrites and their application-antenna cores, television picture tube.</p> <p>2.4 <u>Electromagnetic Spectrum:</u> Definition, range, applications</p> <p>2.5 <u>Ultrasonic Waves:</u> Ultrasonic waves, production of ultrasonic waves by magnetostriction transducer, Application – Flaw detection, drilling, welding, cleaning.</p> <p>2.6 <u>Nanotechnology:</u> Introduction to nanotechnology, principle and applications.</p>	14	16
3	<p>3.1 <u>Lasers:</u> Excitation of particle, optical pumping, types of transitions – non radiative and radiative, spontaneous and stimulated emission, population inversion, resonance cavity, active system, Principle of laser, types of lasers, - ruby laser, Helium-Neon laser, comparison between ruby and He-Ne lasers, Uses of lasers</p> <p>3.2 <u>Fiber Optics:</u> Principle, structure of optical fibers properties & applications.</p>	9	12

Teaching methodology: Chalk board, Group Discussions, handouts, Question Bank, PPT, Transparency, Seminar, and Guest Lecture.

A) Term work:

Skills to be developed:

i) Intellectual Skills:

- Discrimination skill will be developed after studying topics: types of resistor and capacitors, types of lasers.
- Comprehension skill will be developed after studying concept, principles laws and rules given in the syllabus.

ii) Motor Skills:

- Drawing and connecting circuit skill will be developed after completing practicals.
- Measurement skill will be developed after completing practicals.
- Observing the result and comparing skill will be developed after completing practicals.

List of Experiments:

- 1) Specific resistance by voltmeter ammeter method.
- 2) Measurement of EMF by potentiometer.
- 3) Measurement of resistance in series and parallel.
- 4) To study the effect of temperature on the resistance of – thermister.
- 5) To study the effect of temperature on the resistance of - copper coil.
- 6) Measurement of resistance by using color code and digital multimeter.
- 7) Measurement of divergence of light beam by laser.

- Term work includes any six practicals (six weeks)& one mini project/seminar(six weeks)

Learning Resources:**A) Books:**

Sr. No.	AUTHOR	TITLE	PUBLISHER
1	R.K.Gaur, S.L.Gupta	Engineering. Physics	Dhanput Raj Publication.
2	Prof.M.P.Kurian, Prof. R. B. Birhade, Prof. A. A. Mokashi	Applied Physics	Reliable Publications.
3	Dr.A.P.Saxena & Others	Principles of Physics	J.K.Jain Brothers TTTI, Bhopal.
4	Mrs.V.C.Chinchwadkar	Text Book in Physics	Somaiya Publications, Bombay.
5	David Halliday Robert Resnik	Physics	Wiley Eastern Limited.

B) Web sites for references:.

1. www.physicsclassroom.com
2. www.hyperphysics.com
3. www.physicsinfo.com

C) Video

www.Youtube.com

D) PPT

www.khanaacademy.com
www.slideshare.net

DIPLOMA PROGRAMME IN: CIVIL/MECH./ELECT./COMP./E&TC. ENGINEERING

Course : Technical English
Course Category: Foundation

Course Code: R14SC1707
Credits : 4

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
2	2	3	80	20	-	-	25	125

Rationale:

Students need effective writing skill in their academic and professional life. This syllabus is need based and special efforts are taken to improve the writing skills of students. Students admitted to polytechnic come from rural and urban areas. They are from different mediums and backgrounds. As the students are weak in writing correct English, more stress is given on improving their basic concepts of written communication.

Objectives:

The students will be able to

1. Learn the basic concepts of grammar and sentence formation.
2. Express their ideas logically and correctly.
3. Comprehend the given passage and arrange their ideas in sequential order.
4. Improve their presentation skills in oral and written communication.
5. Interact effectively from the industry point of view.
6. Use the various formats of business correspondence.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	Grammar: 1.1 Parts of Speech. 1.2 Transformation of sentences. [tenses, prepositions, conjunctions, punctuation, direct-indirect speech, active & passive voice] 1.3 Features of technical writing.	8	16
2	Communication: 2.1 Written and oral communication. 2.2 Barriers in communication. 2.3 Principles of communication	4	12
3	Applied Writing: 3.1 Dialogue writing 3.2 Comprehension. 3.3 Speech writing on :	4	12

	- Farewell speech - Introducing a guest -Vote of thanks		
4	Office Drafting: 4.1 Notice and Circular. 4.2 Memo. 4.3 Email writing.	4	12
5	Business Correspondence: 5.1 Letter of Enquiry, Order and job application. 5.2 Letter of Complaint, resignation, reminder. 5.3 Joining letter, appreciation letter.	8	16
6	Report writing: 6.1 Visit report. 6.2 Accident report. 6.3 Progress report, Investigation report.	4	12

Teaching Methodology: Chalkboard, white board, improved lecture method, discussion method, power point Presentations, case study.

Term work: Skills to be developed:

i) Intellectual Skill:

- Speaking and listening skills will be developed on completion of the assignment nos.7-12 of term work.
- Presentation skills will be developed on performance of assignment nos.1-6 of term work.
- Writing skills will be developed by studying topics of applied writing, Office drafting, Business correspondence and Report writing.
- Reading and comprehension skills will be developed by studying the topic of Comprehension.

ii) Skills to be developed in Professional practices are included in these assignments.

List of Practical/Assignment/Experiment:

1. Self introduction. (Professional Practices)
2. Technical presentation. (Professional Practices)
3. Elocution. (Professional Practices)
4. Power Point presentation. (Professional Practices)
5. Email Writing.
6. News Presentation. (Professional Practices)
7. Introduction of Basic English words and their pronunciation.
8. Introduction of friend, guest, visitors.
9. Meeting and greeting people.
10. Talking about the family.

11. Giving directions about places in town.
12. Describing your home, neighbourhood and region.

(**Note:** Practical no.7 to 12 will be covered by using Linguaphone Language lab machine. In every practical student will solve the assignment based on that unit. Student will learn basic English words, their pronunciation, introducing new situations and rules to keep the conversation going)

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Locker, Stephen Kyo Kaczmarek	Business Communication : Building Critical Skills	Published by McGraw Hill Professionals.
2	Alok Pandey & Deepak Pandey	Advanced English Grammar & Composition	Published by Sahni Publication, Delhi-7.
3	Raymond Murphy	Intermediate English Grammar	Published by Foundation Book 2003 (Second Edition), New Delhi.
4	Raymond Murphy	Essential English Grammar	Published by Foundation Book Pvt. Ltd., 2004 (Second Edition), New Delhi.
5	M.P. Bhatia	Applied Grammar & Composition	Published by M.I. Publications (Eighth Revised Edition), Agra.

B) Web sites for references :

1. www.learn4good.com
2. www.fluentzy.com
3. www.edufind.com
4. www.khake.com
5. www.learnenglish.org.uk
6. www.english4engineer.com
7. www.owl.english.purdue.edu

DIPLOMA PROGRAMME IN: CIVIL/MECH./ELECT./COMP./E&TC. ENGINEERING

Course : Communication Skills
Course Category: Foundation

Course Code: R14SC1708
Credits : 3

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
1	2	-	-	-		@25	25	50

@ Internal Exam

Rationale:

The old course materials comprising anthologies of prose selections and the old methodology based mainly on the classroom lecture are not conducive to the development of study skills and communicative competence in the students. Therefore, a need to develop an appropriate course in English for students of engineering and technology and to adopt an innovative approach to English language teaching and learning is essential. The aim of this course is to impart to the students the necessary communication skills that they need in their academic and professional life.

This course demands an actual use of the English language by students in the classroom and encourages interaction among them. It is designed to develop the linguistic skills and not to test their memory skills. In this new approach, all the four skills involved in learning a language, namely- 1) Listening 2) Reading 3) Writing 4) Speaking are developed.

Objectives:

The students will be able to

1. Practice the basic skills of speaking, reading, listening and writing.
2. Express their ideas correctly and fluently in English.
3. Interact with others in English and gain confidence in the use of the English language.
4. Realise the importance of effective presentation skill.
5. Improve their communication skill that will lead to their overall personality development.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS
1	Presentation Skills: 1.1 Personal grooming. 1.2 Matter of presentation. 1.3 Manner of presentation.	3
2	Interview Techniques: 2.1 Communication skills. 2.2 Stress management. 2.3 Presence of mind.	3
3	Group Discussion Techniques: 3.1 Manners and etiquettes. 3.2 Discussion rules.	3

	3.3 Effective presentation of views.	
4	Body Language: 4.1 Facial expressions. 4.2 Posture and gesture. 4.3 Eye movements.	3
5	Resume Writing: 5.1 Correct language. 5.2 Strengths and achievements. 5.3 Format of biodata.	2
6	Vocabulary: 6.1 Synonyms. 6.2 Antonyms. 6.3 Homonyms.	2

Teaching Methodology: Chalk board, Whiteboard, Discussion Method, Power Point Presentation,

Case study, Improved Lecture Method etc.

Term work:

Skills to be developed:

i) Intellectual Skills :

- Listening and speaking skills will be developed on completion of assignments of Term work & the topic of group discussion techniques.
- Presentation skills will be developed by studying the topic of Presentation skills and after performing the assignments based on it.
- Writing skills will be developed by studying topic of resume writing.

ii) Skills to be developed in Professional practices are included in these assignments as presentation and guest lectures.

List of Practical/ Assignment/Experiment

1. Interview of the candidates. **(Professional Practices)**
2. Debate on different topics. **(Professional Practices)**
3. Poster Presentation. **(Professional Practices)**
4. Group discussion. **(Professional Practices)**
5. Role Play. **(Professional Practices)**
6. Power Point Presentation. **(Professional Practices)**
7. Talking about different jobs and types of work.
8. Talking about your hobbies and enquiring about those of other people.
9. Enquire about people's programmes, plans and booking facilities.

10. Telephone etiquettes and information about the postal service.
11. Talking about the public transport system.
12. Talking about accommodation facilities in a hotel & shopping.

(**Note:** Practical no.7 to 12 will be covered by using Linguaphone Language lab machine. In every practical student will solve the assignment based on that unit. Student will learn the conversation techniques, pronunciation, etiquettes, manners and he will develop the ability to speak in different situations).

Learning Resources:

A) Books :

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Dr.B.R.Kishore , D.S.Paul	Kumar's Group Discussions and Interviews	Vee Kumar Publications Private Limited, New Delhi- 110008.
2	Adam B. Cooper	PowerPoint Presentations that Sell	McGraw Hill Professionals.
3	R.C.Bhatia	Business Communication	Ane Books India, New Delhi.
4	Krishna Mohan, Meera Banerji	Developing Communication Skills	Published by Rajiv Beri for Macmillan India Ltd., New Delhi.

B) Web sites for references:

1. www.skillstudio.co.uk
2. www.khake.com
3. www.search4excellence.com
4. www.selfgrowth.com
5. www.mindtools.com

DIPLOMA PROGRAMME: ELECT. /COMP. ENGINEERING

Course : Engineering Graphic Skills

Course Code: R14ME1202

Course Category: Foundation

Credits : 6

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
2	4	-	-	-	-	-	50	50

Rationale:

Drawing which is known as the language of engineers is widely used means of communication among the designers, engineers, technicians & craftsmen in an industry. The translation of ideas into practice without the use of this graphic language is really beyond imagination. Thus for the effective & efficient communication among all those involved in an industrial system, it becomes necessary for a diploma engineer to acquire the appropriate skills in the use of graphic language. This preliminary course aims at building a foundation for the further courses in drawing and other allied subjects.

Objectives:

The students will be able to

1. Understand basic principles of engineering drawing.
2. Draw orthographic projections of different objects
3. Draw isometric view from given two orthographic views
4. Understand and Draw various engineering curves and know their applications

Course Details:

UNIT	NAME OF THE TOPIC	HOURS
1	1.1 Introduction To Subject : Use of instruments, types of lines, types lettering, full, enlarging and reducing scales, dimensioning techniques. 1.2 Geometrical Construction : To construct a regular polygon of given side. To construct a regular polygon in a given circle. To inscribe a circle in a given polygon. To circumscribe a circle around a given polygon. To draw circles touching each other and the sides of a given polygon internally and externally 1.3 Tangent Exercises : To bisect a given straight line/arc/angle. To divide given straight line into given number of equal parts. To draw a normal to a given straight line/arc from a given point within or outside it. To draw a straight line parallel to a given straight line / arc through a given point / at a given distance. To draw an arc touching to two straight lines / two arcs (internally / externally) / one line and one arc. To draw an internal / external tangent to two given arcs apart from each other.	7

2	2.1 Redraw Figures : To redraw the given figure (using the knowledge of geometrical constructions and tangent exercises). 2.2 Construction Of Curves : To study the construction of following curves using the method mentioned against them. Ellipse – Directrix focus method, arcs of circle method and concentric circle method. Parabola – directrix focus method and rectangle method. Involute – of a polygon, of a circle and of combination of a polygon and circle.	7
3	3.1 Orthographic Projection: Conversion of simple pictorial views into orthographic projections using first angle and third angle method of projections. Dimensioning the views.	4
4	4.1 Sectional Views: Conversion of simple pictorial views into sectional orthographic projections using first angle and third angle method of projection. Dimensioning the views.	4
5	5.1 Isometric Projections and Views: Construction and use of isometric scale. Conversion of simple orthographic views into isometric projections / views.	5
6	6.1 Freehand Sketches: The ends and thread profiles. Conventional representation of threads. Types of nuts, bolts, washers, set screws. Types of rivet heads and riveted joints. Types of sections – full, half, revolved, removed offset. Conventional breaks for circle and rectangular sections.	5

Teaching Methodology: Discussions, Chalk-Board, Charts, Models, and Transparencies.

A) Term Work:

Skills to be developed:

- i) **Intellectual Skills:** • Understand • Visualize • Reading
- ii) **Motor Skills:** • Handle • Draw

List of Drawing Sheets / Assignments:

Sr. No.	Topic Name	Number of sheets
1	Geometrical constructions and tangent exercise	1
2	Redraw and Engineering Curves	2
3	Orthographic views	2
4	Sectional views	2
5	Isometric views	2
6	Freehand sketches	1

Learning Resources:

A) Books:

SR.NO.	AUTHOR	TITLE	PUBLISHER
1	N.D. Bhatt	Engineering Drawing	Charotar Publication, Anand.
2	Mali and Chaudhary	Engineering Drawing	Vrinda Publications, Jalgaon
3	Kamat & Rao	Engineering Drawing	Jeevandeep Publications, Mumbai
4	N.Y. Prabhu	Geometrical Engineering Drawing	Pune Vidyarthi Griha, Publications, Pune.
5	Ozarkar & Utturkar	Engineering Drawing	Maharashtra Publishing house
6	K. Venugopal	Engineering Drawing	New Age International Ltd., Delhi

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Computer Fundamentals

Course Code: R14CP1401

Course Category: Foundation

Credits : 7

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	4	3	80	20	-	-	50	150

Rationale:

Computer is one of the most influential instruments available in modern times. Although the application domain of computer depends totally on human creativity and imagination, it covers the wide range of applications including education, industries, government, medicine, scientific, research, law, music and arts. This subject contains the fundamentals of computer systems focusing on various hardware, storage devices, software components, and concept of operating system, network and its types. This subject prepares foundation for the study of other courses.

Objectives:

The students will be able to

1. Understand the working of computer systems.
2. Understand the functions of operating system.
3. Use various DOS commands.
4. Use MS-office for creating various types of documents.
5. Use various utilities of Windows OS.
6. Use Internet for e-mail and browsing.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	1.1 Introduction To Computers : What is computer? Characteristics, limitations of computer and basic components of computer. Generations of Computers: First Generation Computers, Second Generation Computers, Third Generation computers, Fourth Generation Computers and Fifth Generation Computers. Classification of Computers: Based on applications, based on size and capability (Microcomputers (block diagram of microcomputer), Mini computers, Mainframe computers, Super computers), Applications of computers. 1.2 Number Systems And Codes : Decimal system ,Binary systems, Hexadecimal system, Octal System, ASCII code, 16 bit Unicode. Conversion of numbers- Non-Decimal (Binary, Hexadecimal, Octal) to Decimal, Decimal to Non-Decimal (Binary, Hexadecimal, Octal), Binary to octal and vice versa, Binary to hexadecimal and vice versa.	8	12

2	Input and Output Devices: 2.1 Input Devices: Introduction, Keyboard. Pointing Devices- Mouse (Mechanical and Optical), Joystick, and Touch screen (Introduction). Scanning Devices – Handheld, Flatbed, Drum, Slide Scanner, Optical Recognition Devices – OCR Devices, OMR Devices, MICR Devices, Bar code reader. Introduction to -Digital Camera, Voice Recognition System. Media Input Devices-Microphone, Webcam, Graphics tablet. 2.2 Output Devices: Introduction. Display Monitors- CRT, LCD, TFT. Printers- Impact Printers- Dot matrix, Daisy wheel, Drum Printer. Non Impact Printers- Ink jet, Laser. Plotters – Drum, Flat-bed, Inkjet. Projectors.	9	16
3	Memory and Storage Systems: Introduction, Memory Representation, RAM and types of RAM – Static, Dynamic, ROM and types of ROM –PROM, EPROM, EEPROM, Flash ROM Storage Systems, Magnetic Storage Systems- Magnetic tapes, Magnetic disks. Optical Storage Systems- Read only optical disk, write once read many. Hard disk, CD, DVD.	7	12
4	4.1 Computer Software and Operating Systems Introduction, types of Computer software- System Software, Application Software. System Development Programs – Language Translators (Assembler, Compiler, Interpreter), Linkers, Debuggers, Editors. Introduction, Functions of Operating System (Introduction) - Process Management, Memory Management, File management, Device Management, Security Management. Types of operating systems- Batch processing, Multi-user, Multitasking, Real-time, Multiprocessor, Embedded operating systems. 4.2 Programming Languages Introduction to Programming Languages. Generation of Programming languages – 1GL, 2GL, 3GL, 4GL, 5GL,	9	16
5	5.1 MS-DOS : Introduction, Internal commands – dir, mkdir(md), rmdir(rd), chdir(cd), type, copy, del, cls ,date, time. External commands - attrib, edit, tree, chkdisk, and help. 5.2 Exposure to Windows XP/07: Introduction, Desktop (taskbar, customising taskbar, desktop, customising desktop), My Computer, My Documents, My Network Places, Recycle Bin, Windows Explorer. Files and Folders- creation, moving, copying, renaming, deleting. Searching in Windows XP.	8	12
6	6.1 Computer Networks : Introduction, Applications of Network. Classification– Geographical Area (LAN, WAN, MAN, Internet,	7	12

	<p>Intranet), Use of computer nodes (Client Server Networks, Peer-to-peer Networks).</p> <p>Network Topologies – Introduction, Types- hierarchical, bus, star, ring, mesh, and hybrid.</p> <p>6.2 Internet and World Wide Web :</p> <p>Introduction, Evolution of internet, Applications of Internet.</p> <p>Basic Internet Terms: Webpage, Website, Home Page, Browser, URL, Hypertext, Internet service provider, Web server.</p> <p>World Wide Web, Search engine and refining the search, Electronic Mail (E-mail) and its advantages and disadvantages.</p>		
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Teaching Methodology – Chalkboard, Discussion, Power Point Presentation.

A) Term Work:

Skills to be developed:

i) Intellectual Skills:

- Identify the input, output devices.
- Select proper software/utility.
- Use of various application software's.
- Use of various Windows accessories.

ii) Motor Skills:

- Handling of different Peripheral devices.
- Make proper connection.

List of Practical / Assignments / Experiments:

1. Illustration of windows components – My Computer, My Documents, Recycle Bin.
2. Use of Windows – Creation/deletion of files, folders, icons and creating shortcut on desktop.
3. Working with Control Panel settings (Display setting, Mouse, Printer, User Account).
4. Use of the Windows accessories - Paint, Calculator, Clock.
5. Use of the Windows accessories ---Notepad, WordPad.
6. Paragraph formatting, Bullet and numbering, in MS-Word.
7. Insertion of Clipart, auto shapes and word art in MS-Word.
8. Editing header and footer and Insertion and deletion of table, rows and columns using MS-Word.
9. Editing Text, spell check and autocorrect feature, page setup and Print feature using MS-Word.
10. Insertion of bookmark and hyperlink in MS-Word.
11. Creating and deletion of slides and slide show, Giving various transition effects and animation effects using Power Point.
12. Custom Animation and rehearse timing using Power Point.
13. Creating, manipulating & changing the chart type.
14. Insertion, deletion and editing information in spreadsheet and insertion, deletion and naming a worksheet.
15. Formatting cell and table, Study of Formulas, functions and named ranges.
16. Data Sort and validation in MS-Excel.
17. Introduction to DOS and use of internal DOS commands.
18. Use of external DOS commands.
19. Study of Web Browser. Creating email account, sending and receiving mail.

Professional Practices:

1. Installation of Windows and MS-Office.
2. Development of Mini project in MS-Word/Excel/Power Point.

Learning Resources:**A) Books:**

SR. NO.	AUTHOR	TITLE	PUBLISHER
1.	# E.BALGURUSAMY	Fundamental of Computer	McGrawHill, 1 st Edition, 2009
2.	# ITL Education Solution Ltd.	Introduction To Information Technology.	Pearson
3.	MORLEY & PARKER	Fundamental of Computer	Cengage Learning IE, 2008
4.	V. RAJARAMAN	Fundamentals Of Computers	Eastern Economy Edition, 4 th Edition, 2004
5.	D.Ravichandran, A.B.Patil	Computer Fundamentals	TMH pub.
6.	P.K.SINHA	Computer Fundamentals	BPB <i>Publication</i>
7.	Richard Allen King	The MS DOS Handbook	BPB <i>Publication, 2nd Edition</i>

Text books

B) Web sites for references:

1. <http://www.howstuffworks.com/>
2. <http://www.computerhope.com/msdos.htm>
3. <http://office.microsoft.com/>
4. <http://www.comptechdoc.org/basic/>

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Electronic Devices and Components

Course code: R14EX1415

Course Category: Foundation

Credits : 05

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
03	02	3	80	20	-	-	25	125

Rationale:

We use many Electronic equipment in our day to day life. Basic electronics is one of the subjects which is the foundation of all advanced electronics courses. It starts with PN junction which makes the student to follow the functioning of all semiconductor based electronic devices and components. It makes students conversant with basic terms and concepts in Electronics.

Objectives:

The students will be able to

1. Describe the formation of PN junction.
2. Draw the characteristics of basic components like diode, transistor etc.
3. Draw and describe the basic circuits of rectifier, filter, regulator and amplifiers.
4. Understand operation, use and types of amplifiers.
5. Understand various uses of operational amplifiers
6. Use various electronic instruments for measurement of electrical signals

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	Introduction To Components : Definition of Electronics, applications of Electronics Classification of components as active & passive Passive Components- i) Resistors- Basic concept, Symbol, Types and construction of- Fixed: carbon composition, carbon film, metal film, wire wound Variable: wire wound Potentiometer Temperature dependant resistor: Thermistors- NTC & PTC Color code, power rating ii) Capacitors- Basic concept, Symbol, Types and construction of- Fixed: paper, ceramic, electrolyte, mica Variable: trimmer Voltage rating of capacitor	9	16

	iii) Inductors- Basic concept, symbol, Types and construction of- Air core, iron core, and ferrite core, Applications.		
2	Diode : P-N junction, forward and reversed bias ZENER DIODE- Concept, symbol, characteristics POWER SUPPLIES- Diode as a rectifier, half wave, full wave, bridge rectifier with capacitor filter; Regulator-basic concept, needs, Zener regulator, circuit diagram & operation; 3 pin IC regulators- 78xx, 79xx series. LED - Concept, symbol, construction and applications PHOTODIODE- Basic concept, Symbol, construction & operation.	8	12
3	Transistors And Amplifiers : Bi junction concepts, PNP & NPN types, amplification action, CB, CE, CC configurations, input/output characteristics for CB, CE, CC configurations, active, saturation & cut-off regions, load line concept, operating point concept, Concept of biasing, need, base bias, collector bias, emitter bias, transistor as a CE amplifier with potential divider biasing FET - Concept, symbol, operation, characteristics of FET Concept of MOSFET- depletion type & enhancement type.	9	12
4	Oscillator : Need of an oscillator, classification as LC, RC & crystal oscillators, tuned LC circuit, Barkhausen's criteria of oscillation LC oscillators: Circuit diagram and operation of Hartely, Colpitt oscillators RC oscillators: Circuit diagram and operation of Wein bridge oscillator Frequency formulae, Crystal oscillators. Multivibrators :Timer IC555 block diagram, Concept of Multivibrator, astable, bistable, monostable multivibrators using IC555.	9	16
5	Operational Amplifiers : Introduction to IC fabrication in brief Differential amplifiers-circuit diagram and operation, Op-amp symbol, pin diagram of IC-741, Op-amp parameters, Op-amp in inverting and non-inverting mode, Application of op-amp as adder, subtractor, voltage follower, Gain formulae.	7	12
6	Instruments : CRO: CRT schematic diagram & operation, Block Diagram CRO, CRO Specifications, CRO front panel controls, use of CRO for measurements of voltage, frequency & display of waveforms Signal Generator: block diagram & front panel controls, uses.	6	12

Teaching Methodology: Chalkboard, Discussion.

A) Term Work:

Skills to be developed:

i) Intellectual Skills:

- Identify
- Discrimination

- Selection
- Interpretation
- Understanding
- Design Approach

ii) Motor Skills:

- Proper connection
- Measurement
- Draw graph paper
- Observe the result and compare

List of Practical / Assignments / Experiments:

1. Use of analog & digital Multimeters for resistance & voltage measurements.
2. Study of resistors, capacitors, inductors
- Symbols of different types, checking on multimeter.
3. V-I Characteristics of Diode.
4. V-I Characteristics of Zener diode.
5. Half wave, full wave rectifier with capacitor filter.
6. Bridge rectifier with capacitor filter.
7. Zener regulator.
8. IC 7805 regulator.
9. Output & transfer characteristics of transistor - CE configuration.
10. Characteristics of CE amplifier – Voltage gain calculation.
11. Characteristics of FET.
12. Astable Multivibrator using IC 555
13. Study of Signal Generator- block diagram & front panel controls.
14. Use of CRO for measurement of voltage & frequency of various signals of signal generator.

Learning Resources:

A) Books:

SER. NO.	AUTHOR	TITLE	PUBLISHER
1	David Bell	Electronic Devices & Circuits	OXFORD, 5 th Ed, 2009
2	N. N. Bhargava	Basic Electronic & Linear Circuits	TMH, 24 th Reprint, 1997
3	Allen Mottorshead	Electronic Devices & Circuits	Reprint, PHI, 2004
4	A. K. Sawani	Electronic Measurement & Instrument	17 th Ed, Dhanpat Rai Pub, 2004
5	Jacob Millman & C. Halkias	Electronic Devices & Circuits	McGraw Hill, 2 nd Reprint,
6	Madhuri Joshi	Electronic Components & Materials	1 st Ed, 1989
7	Anasuya Kalavar	Electronic Materials Components & Devices Technology	Everest Pub House, 6 TH Ed, 2000
8	R. L. Boylestad, L. Nashelsky	Electronic Devices & Circuits	PHI, 8 th Ed, 2004

DIPLOMA PROGRAMME: CIVIL/MECH./ELECT./COMP./E&TC. ENGINEERING

Course : Industrial Organization & Management
Course Category: Allied

Course Code: R14ME2203
Credits : 3

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
3	–	3	80	20	–	–	–	100

Rationale:

This subject is classified under human sciences and is intended to teach students about structure of organization, types of organization, principles of management, functioning of personnel department, industrial laws, and inventory control methods. It also envisages giving exposure to accountancy principles and various networking methods.

Objectives:

The students will be able to

1. Understand the concept of different business organization.
2. Know activities in the various departments like purchase, marketing, personnel, material etc.
3. Know different acts for execution of factory work.
4. Understand principles of Bookkeeping & accountancy.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	Business organizations : 1.1 Types & their foundations, proprietary, partnership, private and public limited companies, co-operative and public sector organizations. Role of public and private sector in the country and their social obligations towards society. 1.2 Principles of organizations, delegation of authority and responsibility, decentralization, committee. Types of organizations such as line/military, staff, line & staff. 1.3 Marketing Management: Definition, Selling V/s Marketing concept, Functions of Marketing management, Market Research, Definition, functions & agencies of advertising, Types of market.	9	12
2	Human Resource Management : 2.1 Personnel management: Duties and responsibilities of personnel management, Manpower planning, Sources of employment, recruitment, selection. Various methods of testing, training and development of workers and supervisors, duties and authorities of supervisors, morale maintenance, motivation. 2.2 Wages and Incentives: Definition of wages, wage payment plans, Concept of incentive.	9	16

	2.3 Safety management: Causes and effects of accident, Safety programmes. 2.4 Labour Laws: Factory act, Employee's State Insurance act, Workmen's Compensation act, Dispute act.		
3	Material and Stores Management : 3.1 Introduction to the functions of material management, material flow in an industry, purchase functions and systems, purchase procedure. Receipt and Issue of material, Types of stores, centralized & decentralized purchase. 3.2 Inventory Control: Objectives of inventory control, inventory and its classification, EOQ (Economic Order Quantity) its derivation (no numericals), ABC analysis, Material Requirement Planning (MRP).	7	12
4	Management Process: 4.1 Management and its various definitions, Importance of management, Difference between management, organisation and administration, Evolution and development of management, Levels of management scientific management. 4.2 Principles of management (14 principles of Henry Fayol). 4.3 Functions of management such as planning, organising, directing, controlling, etc.	6	12
5	Financial Management: 5.1 Objectives & Functions of Financial management. 5.2 Capital Generation & its Types, Finance (methods of raising capital), Finance from Bank, Capital market, Financial institutions, Shares & its types, Debentures, Loans, Financial Ratios. 5.3 Book Keeping & Accountancy, its objectives, principles of double entry book keeping, Accounting Terminology.(Numericals only on Journal & Ledger Account) 5.4 Introduction to Trading account, profit and loss account & Balance Sheet (No Numericals)	9	16
6	Project Management & Quality Management 6.1 CPM/PERT Technique: CPM terminologies, Definitions in PERT, Comparison of CPM & PERT (No Numericals) 6.2 Quality management, Quality Policy, Quality control, Inspection, Concept of Quality circle, TQM, Quality Audit.	8	12

Teaching Methodology: Chalk-Board, Discussions, and Transparencies.

A) Skills to be developed:

- **Intellectual Skills :**
- Understanding
- Appreciation

Learning Resources:

A) Books:

SR.NO.	AUTHOR	TITLE	PUBLISHER
1.	Dr. O.P. Khanna	Industrial engineering & management	Dhanpat Rai & Sons, 1992
2.	J. R. Batliboi	First Steps in Book Keeping	
3.	Dr. B. C. Punmia and K. K. Khandelwal	Project Planning and Control with CPM and PERT	Laxmi Publication, 2002

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1.

DIPLOMA PROGRAMME: COMPUTER ENGINEERING/ E & TC ENGINEERING

Course : Electrical Engineering

Course code : R14EE2304

Course Category : Allied

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	-	-	25	125

Rationale:

Diploma engineers come across machines and equipments involving components and devices based on principles of Electrical Engineering. The course envisages study of principles of DC and AC circuits, construction, working and selection of different types of DC and AC motors and transformers. The basic concepts studied in this subject will be very useful for understanding of other higher level subjects in further study.

Objectives:

The students will be able to understand

1. Facts, concepts & principles of electrical engineering.
2. Fundamentals of DC& AC circuits.
3. Fundamentals of DC & AC machines & motors.
4. Use of various equipments for computer laboratory.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	<p>1.1 D.C. Circuits And Basic Terms :</p> <p>Revision of basic terms, series and parallel circuits, resistance, specific resistance and temperature co-efficient of resistance (No numerical). Kirchoff's current law, Kirchoff's voltage law. Application of Kirchoff's laws for simple network solutions. Numericals.</p> <p>1.2 A.C. Fundamentals :</p> <p>Generation of alternating voltage and current i.e. principle, construction and working of elementary alternator.</p> <p>Graphical representation of e.m.f. and current. Equation of A.C., E.M.F. Definitions : instantaneous value, cycle, period, frequency, amplitude. Values of alternating voltage and current: peak value, average value, r.m.s. value.</p> <p>Definition of peak factor and form factor. (No derivation)</p> <p>Phasor representation of an alternating quantity. Concept of phase, phase difference, in- phase, out of phase quantities. Phasor diagram of a sine wave of same frequency, meaning of lagging and leading. Power factor. Waveforms and phasor diagrams for-</p> <p>a) Purely resistive circuits.</p> <p>b) Purely inductive a.c. circuits.</p> <p>c) Purely capacitive circuits.</p> <p>Concepts of Inductive reactance, Capacitive reactance.</p>	9	16
2	<p>2.1 A. C. Series Circuits :</p> <p>R-L circuit: Phasor diagram, Impedance, Impedance triangle, Power equation.</p> <p>R-C circuit: Phasor diagram, Impedance, Impedance triangle, Power equation.</p> <p>R-L-C series circuit: Phasor diagram, Impedance, Impedance triangle, Power equation, Phase relationship between voltage and current.</p> <p>Series resonance.</p> <p>Definition of Apparent Power, Reactive Power, True Power, Power Factor.</p> <p>2.2 Three Phase Circuit :</p> <p>Introduction to three phase supply systems. Advantages of polyphase circuits over single phase. Generation of three phase voltage.</p> <p>Introduction to star and delta connection and applications and their applications.</p> <p>Voltage, current & power relations on star and delta connected balanced system and numericals.</p>	8	12

3.	3.1 Single Phase Transformer : Definition of transformers. Principle of operation. Constructional details. Types of transformers. E.M.F. equation. Concept of ideal transformer. Voltage, Current ratio of a transformer. Concept of practical transformer on- load. Phasor diagram of transformer at No-load and on-load at various Power factor. Basic Equivalent circuit of transformer, Regulation of a transformer. Transformer Losses. Efficiency of transformer. KVA rating of a transformer. Methods of finding efficiency and regulation of a transformer, O.C &S.C tests on single phase transformer, direct loading test on single phase transformer.	7	12
4	4.1 D.C. Machines : Introduction, Constructional features and working of d.c. generator and specifications, E.M.F. equation of a d.c. generator & numerical. Types of d. c. motors . Working principle & torque equation d.c. motor and specifications, (Numerical). Characteristics and applications of d.c. motors, reversal of direction of rotation of motor. Necessity, construction and working of a d.c. shunt motor starters. Speed Control of d. c. shunt motor.	8	12
5	5.1 Motors : Induction motors - Constructional details, Comparison between squirrel cage & slip ring induction motor. Working of three phase induction motor. Method to change the direction of rotation of three phase induction motor. Starters. Applications of squirrel cage & slip ring induction motors. General load characteristic of three phase induction motor. Advantages of three Phase induction motor. Construction, working, characteristics and applications of - a) Resistance split phase motor. b) Capacitor split phase motor. c) Shaded pole type motor. Characteristics and Application of following special motors- a) Universal motor/A.C. series motor. b) Linear induction motor. c) DC Servo motor. d) AC servo motor 5.2 Stepper motor: Construction of variable reluctance. Permanent magnet and hybrid type of stepper motor. Characteristics of stepper motor, Applications of stepper motors. Speed control of stepper motors - various methods. Specifications of all above motors.	9	16

6	6.1 Special Equipment: Basics of UPS, SMPS and Voltage Stabilizers: Principle of operation, block diagram & working, Types, advantages & disadvantages. Spike suppresser: Reasons for supply spikes, effect of spike on PC, principle, construction & working of spike suppresser. 6.2 Protective Devices: a) Fuse: Need and types b) MCB: general construction & operation, advantages of MCB over fuse. c) Earthing : need of earthing for electrical installation, types of earthing. d) ELCB: need of ELCB, general construction & operation.	7	12
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Teaching methodology: Chalk board, discussion, charts, and PPT.

A) Term Work:

Skills to be developed:

i) Intellectual Skills :

- Identifying the various types of motors and Transformers used in Industries for various applications.
- Selecting proper type of Motor, Transformer, and other electrical Equipments.
- Interpret the results obtained during the practical.
- Writing the report after performing the practical by comparing the obtained data with standard data.

ii) Motor Skills :

- Proper connection of appliances for a particular circuit diagram.
- Measurement of indicated values by various indicating instruments.
- Observe & control the readings shown by various instruments.

List of Practical :

1. V, I, power calculations with lamp load for series & parallel circuit combinations (DC/ AC).
2. V, I, PF & power calculations of R-L-C series circuit combinations.
3. Determination of Line & Phase relationship of voltage & current for three phase star & delta connection.
4. To determine efficiency & relation of single phase transformer by O.C & S.C test.
5. To determine efficiency and regulation of a single phase transformer by direct loading test.
6. Study of D.C. shunt motor starter & starting & reversing of a D.C. shunt motor.
7. Speed control of D.C. shunt motor by -
 - a) Armature control method.
 - b) Field control method.
8. Study of a 1 phase induction motor (starting & reversing).
9. Study of types of three phase Induction Motor starters.
10. Study of types of stepper motor.
11. Study of AC and DC servo motor.
12. Characteristic of UPS and Voltage Stabilizer.

Learning Resources:

A) Books :

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# B. H. Deshmukh	Electrical Engineering	Nirali Prakashan
2	# B. L. Theraja,	Electrical Technology Vol.-I	S. Chand Publishing, 2009
3	B. L. Theraja	Electrical Technology Vol.-II	S. Chand Publishing, 2002

: Text Book

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Workshop Practice

Course Code: R14ME2209

Course Category: Allied

Credits : 4

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
-	4	-	-	-	-	-	50	50

Rationale:

The subject creates the awareness of various Workshop tools and operations among students. It is also necessary for the students to have some working knowledge of various wiring accessories, wiring systems.

Objectives:

The course is divided into two parts- General workshop & Electrical workshop.

1. The students will know the various tools & machinery in the workshop, various fitting, welding techniques & tin smithy work.
2. To develop practical skills in handling various tools, accessories & equipments in designing/testing electronic circuit.
3. To develop skills for identifying, testing various electrical components, measurement of electrical parameters & to be familiar with different wiring systems.

Course Details:

UNIT	NAME OF THE TOPIC
1	1.1 Mechanical Workshop: Demonstration of – Basic tools as spanners, pliers, screw drivers Machinery, equipments, marking & measuring instruments Fitting- Introduction to various fitting tools One job involving drilling & tapping operations Welding- Introduction to various welding equipments One job involving lap joint Tin Smithy- Introduction to various tools & operations One job involving three to four tin smithy operations CNC Machines- Introduction, construction & working principle Demonstration of various operations on CNC machine

2	<p>2.1 Electrical Workshop:</p> <p>Cables: Co-axial, twisted pair, ribbon, UTP, fiber optic</p> <p>Connectors: BNC, male/female D type, flat cable connector, RJ-45</p> <p>Switches: Toggle- SPST, SPDT, DPST, DPDT Thumb wheel, rotary, push button, DIP Keyboard switches- Mechanical, Capacitive, Membrane</p> <p>Relays: General-purpose relay, Types & uses</p> <p>Wiring accessories: Switches, sockets, holders, plug pins, indicating lamps, fuses</p> <p>Wiring systems: PVC casing capping, conduit wiring</p> <p>Soldering: Soldering materials and techniques, PCB, Preparation of PCB for simple circuit</p> <p>Transformers: Types, construction, applications</p> <p>Study of MCB</p> <p>Preparation of extension board</p>
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A) Term Work:

Skills to be developed:

i) Motor Skills:

- Proper connection
- Observe and compare various components
- Testing
- Handling of tools and equipment

List of Practical / Assignments / Experiments:

1. One job involving drilling & tapping operations (3 turns)
2. One job involving lap joint (3 turns)
3. One job involving three to four tin smithy operations(4 turns)
4. Demonstration of various operations on CNC machine((2 turns)
5. Study of cables
6. Study of connectors
7. Soldering practice
8. study of wiring accessories
9. Study of wiring systems
10. Study of MCB
11. Preparation of extension board

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Anasuya Kalavar	Electronic Materials Components & Devices Technology	6 th Ed, 2000, Everest Pub. House,
2	Hajara Chowdhari	Workshop Practice Vol 1	10 TH Ed, 1995, Media Promoters & Pub

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Marketing Management

Course Code: R14EE2302

Course Category: Allied

Credits : 3

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	P/T	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
2	1	-	-	-	-	@25	25	50

@ Internal Oral

Rationale:

Engineer of any branch may be required to deal with marketing activity related with his field. This course covers the basic techniques used in the marketing management generally related with any field of application.

Objectives:

The student should be able to

1. Know the principles of market research & analysis
2. Know about the organization of marketing department& marketing network
3. Know about the aspects of international marketing.
4. Undertake a small market survey

Course Details:

UNIT	NAME OF THE TOPIC	HOURS
1	1.1 Introduction - Marketing Management, process & functions. Developing marketing strategies. Marketing environment.	7
2	2.1 Market Research & Sales forecasting - Need of market research, Methods of data collection, sales forecasting, consumer behavior.	7
3	3.1 Market Planning - market positioning, market targeting, marketing strategy, product policy, branding, pricing & pricing strategy, Advertising.	7
4	4.1 Sales management- Setting objectives& deciding policies, development of sales force, sales organization. 4.2 International marketing - Liberalization, need of International Marketing, International marketing process & Exim policy of Govt. of India.	7

A) Term Work:

Skills to be developed:

i) Intellectual Skills:

- Identify
- Selection
- Understanding
- Report Writing
- Discrimination
- Interpretation
- Reading

The term work shall consist of following

A group of 4 to 5 students have to complete the following assignments

1. Select an existing /hypothetical product related with their discipline
2. Carry any market survey by preparing suitable questionnaire.
3. Prepare a marketing plan indicating the advertising, price strategy & sales promotion techniques.
4. Prepare & submit the report of above activities.

The internal oral examination will be conducted on the above report.

Learning Resources:**A) Books:**

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Kotler	Marketing Management (11 th Edition)	Pearson Education India.
2	Dr. V.O. Vorkey	A Handbook on Marketing Management	Everest Publishers, Pune
3	Dr. S. L. Gupta	Elements of Marketing Management	Everest Publishers, Pune

DIPLOMA PROGRAMME: CIVIL/ MECH./ELECT./COMP./ ELEX. ENGINEERING

Course : Elements of Accounts and Finance

Course Code: R14ME2208

Course Category: Allied

Credits : 3

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
2	1	-	-	-	--	25@	25	50

@ Internal oral

Rationale:

The aim of this course is to provide with the basic level skills and knowledge required by engineers in the accounting and finance. The curriculum envisages the elementary theory and practice of financial accounting. This involves understanding of the concepts and choices that underline measurement and disclosure in financial statements.

Objectives:

The students will be able to

1. acquire knowledge of basic concepts of accounting
2. acquire basic accounting knowledge
3. interpret the financial statements

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	Introduction to Book-keeping and Accountancy Meaning & definition, objectives, importance and utility, Difference between Book-keeping and Accountancy. Basis of accounting: Cash basis and accrual basis Branches of accounting: Financial , Cost, management Accounting terminology: Business transactions- Cash, Credit, Non-monetary transactions. Types of assets- Fixed, Current, Fictitious. Types of liabilities: Fixed, Current, Contingent. Net worth, Capital, Debtor, Creditor, Expenditure, Types of Expenditure: Capital, Revenue, Deferred revenue. Solvent- insolvent.	5	
2	Fundamentals of double entry book-keeping. Principles, Comparison between conventional and double entry system, Classification of accounts: Personal, Real, Nominal. Meaning of debit and Credit. Basic rules for debit and credit for different accounts.	6	
3	Journal: Definitions, Importance and utility of journal, Specimen of a journal, Journalizing and steps for journalizing.	8	

	Ledger: Meaning, need and contents of ledger, specimen of ledger account, posting of entries in ledger. Balancing of ledger accounts.		
4	Trial Balance: Meaning and purpose. Specimen of trial balance, preparation of trial balance from given balances of accounts, introduction to errors and their rectification methods. Depreciation: causes and need, methods of computing depreciation. Provisions and reserves: Meaning and objectives.	3	
5	Final Accounts: Financial statements, preparation of profit and loss account, trading account, Valuation of stock, provisions for bad debts, Balance sheet: Arrangements of assets and liabilities. Accounting standards.	5	
6	Cash flow and fund flow statements Difference between cash flow and fund flow statement, advantages and limitations. Ratio analysis: current ratio, return on equity, the debt-equity ratio, the dividend payout ratio and the price/earnings (P/E) ratio.	5	

Teaching Methodology: Discussions, Chalk-Board, Charts, and Transparencies.

Term Work:

List of Assignments:

1. Minimum Two exercises on Journalising.
2. At least two assignments on posting entries into Ledger.
3. Preparation of Trial Balance.
4. Interpreting a Profit and Loss Account / Income and Expenditure statement.
5. Reading a Balance Sheet.
6. Exercise on Cash flow statement.
7. Finding financial ratios from Balance sheet and interpreting them.
8. Reading and interpreting financial Statement of a Private/Public Limited Company.

Learning Resources:

Books:

SR.NO.	AUTHOR	TITLE	PUBLISHER
1	T.S. Grewal S.C. Gupta	Introduction to accountancy	S. Chand Publications, New Delhi
2	-	Book-keeping and Accountancy For Std XI And XII	Maharashtra State Board Of Secondary And Higher Secondary Education

DIPLOMA PROGRAMME: CIVIL/MECH./ELECT./COMP./E&TC. ENGINEERING

Course : Entrepreneurship Development

Course Code: R14ME2206

Course Category: Allied

Credits : 3

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	P/T	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
2	1	-	-	-	-	@25	25	50

@ Internal examination

Rationale:

The entrepreneurship development part of the subject consists of topics related to the development of entrepreneurial skills and other details such as selection of product lines, site selection, financial aspects, personnel management, quality control and creative thinking. The subject includes case studies in the related field. The subject emphasizes the development of enterprising qualities among young engineers.

Objectives:

Students will be able to

- 1) Identify entrepreneurship opportunity.
- 2) Acquire entrepreneurial values and attitude.
- 3) Use the information to prepare project report for business venture.
- 4) Develop awareness about enterprise management.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS
1	1.1 Introduction : Definition of entrepreneur, concept of entrepreneur and entrepreneurship, importance of entrepreneur. Types of entrepreneur: Innovating entrepreneur, imitative entrepreneur, fabian entrepreneur, drone entrepreneur and according to type of business. Difference between Entrepreneur and Intrapreneur. 1.2 Entrepreneurial Competencies: - Characteristics of an entrepreneur, qualities of an entrepreneur, competencies of entrepreneur. 1.3 Women Entrepreneur: Definition, characteristics of women entrepreneur. Causes of limited growth in India, remedies for limited women entrepreneurship development.	6
2	2.1 Motivation : Definition and concept of motivation, types of motivation: affiliation, power, and achievement motivation. Need and importance of achievement motivation, challenges of motivation, Motivating factors. Theories of motivation: a) Maslow Hierarchy theory ,b)Mc Gregor X-Y theory, c) Hygiene Factor theory.	4
3	3.1 Creativity and Innovation : Definition and concept of Innovation, definition and concept of Creativity. Characteristics of creative people. Discussion of various examples with respect to creativity and innovation.	5

4	<p>4.1 Business Opportunity Search and Scanning : Opportunities available in different sectors such as manufacturing, services and trading. Classification of opportunities on the following: - Natural resource based, Demand based, Local industrial based, Service sector based, Export based, Skill based, Off-farm based.</p> <p>4.2 Business Idea : Search for business idea, sources of business idea, ways of generating ideas, ideas processing & selection (factors affecting product idea). SWOT Analysis.</p> <p>4.3 Sources of Business Idea : Market survey & techniques, prospective consumers, development in other nation, study of project profile, government organization, trade fair and exhibitions. Checklists for information collection.</p>	6
5	<p>5.1 Government And Non Government Agencies For Promotion and Development: Importance of funds, Types of funds. Various schemes of assistance of government, Government policies and incentives. Registration with various government agencies, definition of SSI and Ancillary.</p>	5
6	<p>6.1 Business Plan Preparation : Project identification, project formulation, feasibility analysis, Estimation of cost of production, Cost volume profit relationship at different levels, Interpretation of financial statements, Institutionalized and Non-institutionalized sources of working capital, Funds flow statements, Loan application form for appraisal. Project report preparation.</p>	6

Teaching Methodology: Group Discussion, visits, guest lectures.

A) Term Work:

Skills to be developed:

Intellectual Skills :

Identify
 Interpretation
 Reading
 Report writing.

a. List of Experiments / Practicals / Assignments:

1. Biography of any entrepreneur.
2. Self Disclosure Exercise. (Who am I?).
3. Self rating questionnaire.
4. Thematic Appreciation Test (TAT).
5. Ring Toss Exercise.
6. Tower Building Exercise.
7. Convince and Crown.
8. Creativity and Problem solving.

Professional Practices

9. Walking through Market.
10. Business plan preparation.
11. Interview of a successful entrepreneur.
12. Interview / Biography of a successful women entrepreneur.

Learning Resources:

A) Books:

SR.NO.	AUTHOR	TITLE	PUBLISHER
1.	Vasant Desai	Dynamics Of Entrepreneurial Development And Management	Himalaya Publishing House, 1997, Reprint-1999
2.	Dilip M. Sarwate	Entrepreneurial Development Concept and Practices	Everest Publishing House, 1996
3.	Gupta Srinivasan	Entrepreneurial Development	Sultan Chand & Sons, 1993
4.	D. D. Mali	Training of Entrepreneurship And Self Employment	Mittal Publications, 1999

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Environmental Studies

Course code: R14CP2401

Course category: Allied

Credits : 3

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	TU	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
2	1	-	-	-	-	@25	25	50

@: Internal Oral

Rationale:

The industrial growth and economic development of the last 150 years have resulted in huge ecological problems such as overexploitation of natural resources, degraded land, disappearing forests, endangered species, dangerous toxins, global warming etc.

It is essential 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, Environmental impacts on human activities, Water resources and water quality, resources, Forests, E-waste etc.

Objectives:

The students will be able to-

1. Understand importance of environment
2. Know key issues about environment
3. Understands the reasons for environment degradation
4. Know aspects about improvement methods
5. Know initiatives taken by the world bodies to restrict and reduce degradation

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	Nature of Environmental Studies 1.1 Definition, Scope and Importance of the environmental studies 1.2 Importance of the studies irrespective of course 1.3 Need for creating public awareness about environmental issues	04	--
2	E-WASTE-I 2.1 What is an E-WASTE? 2.2 Source of E-WASTE 2.3 Effect of E-WASTE on environment 2.4 E-Waste Management 2.5 Responsibilities of GOVT./Industries/Citizens	08	--

3	E-WASTE-II 3.1 Types of E-Waste 1) Monitor 2) RAM 3) Motherboard 4) CPU 5) Mouse 6) Keyboard 7) Processor 8) Circuits/Chips 9) Wirings 10) Cables 11) Conductors 12) Printers 13) CDs/DVDs 14) SMPS 15) TV Sets 16) Electronic equipments/Instruments 3.2 E-Waste Disposal	10	
4	Environmental Pollution 4.1 Definition 4.2 Air pollution: Definition, Classification, sources, effects, prevention 4.3 Water Pollution: Definition, Classification, sources, effects, prevention 4.4 Soil Pollution: Definition, sources, effects, prevention 4.5 Sound Pollution: Definition, sources, effects, prevention	10	--

Teaching Methodology: Chalkboard, Discussion, and Power Point Presentation.

A) Term Work:

Skills to be developed:

i) Intellectual Skills:

- Collection of information, data
- Analysis of data
- Report writing

ii) Motor Skills:

- Presentation Skills
- Use of multi media

List of Activities:

Note: Any one Activity of the following. Write report on visit.

1. Visit to a local area to document environmental assets such as river / forest / grassland / hill/ Mountain
2. Visit to a local polluted site: Urban/Rural/Industrial/Agricultural

Learning Resources:**A) Books:**

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Anindita Basak	# Environmental Studies	Pearson Education
2	R. Rajgopalan	Environmental Studies from Crises to Cure	Oxford University Press

Text book

B) Web sites for references:

1. xa.yimg.com
2. www.newagepublishers.com
3. science-b.hyde.wikispaces.net
4. www.worldofteaching.com
5. www.delhi.gov.in

DIPLOMA PROGRAMME IN:MECHANICAL/ELECT./COMP./E&TC. ENGINEERING

Course : Advanced Mathematics

Course Code: R14SC2701

Course Category: Allied

Credits : 3

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	-	3	80	20	-	-	-	100

Rationale:

Mathematics is the backbone of all technical courses. Understanding the engineering concepts requires logical approach and thinking. The course aims to give the Diploma students a perfect knowledge of Mathematics which can be used in the Engineering field. They will be able to apply the advanced concepts of Mathematics in solving the varied kinds of engineering problems.

Objectives:

The students will be able to

3. Learn the new concepts of Integration, Laplace transform, Probability and Differential equations.
4. Solve the given mathematical problem with intelligent combination of techniques.
5. Apply the laws and principles of Mathematics to practical situation.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	Integration: 1.4 Different methods of integration. Integration by different types. Some general integral. Integration by parts. Integration by partial fraction. 1.5 Definite integral. Properties of definite integral.	12	16
2	Application of Integration: 2.1 Area under the curve. Area between two curves. 2.2 Mean value. 2.3 Root mean square value.	8	12
3	Introduction to Laplace Transform: 3.1 Definition of Laplace transform. First shifting theorem. 3.2 Inverse Laplace transform. Properties of inverse Laplace transform.	6	12

4	Differential Equation: 4.1 Definition of differential equation. Order and degree of differential equation. Formation of differential equation. 4.2 Solution of differential equation of 1 st order and 1 st degree. Variable separable differential equation. Homogenous differential equation. Linear differential equation.	8	16
5	Probability: 5.1 Definition: event, sample space and probability. 5.2 Introduction to permutation and combination. Factorial notation. Meaning of ${}^n P_r$ and ${}^n C_r$. 5.3 Addition theorem for probability. Simple examples on probability. 5.4 Conditional probability.	8	12
6	Probability Distribution: 6.1 Binomial distribution. 6.2 Poisson distribution. 6.3 Normal distribution.	6	12

Teaching Methodology: Chalk board, Discussion, Assignments, printed notes.

Skills to be developed:

i) Intellectual Skills:

- Memorizing skill will be developed after studying the formulae of all the topics.
- Selection skill will be developed after studying the methods of solving problems during selection of appropriate formula.
- Logical thinking will be developed after studying the topic Probability.
- Application skill will be developed after studying the topic Application of Integration

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Peter V. O'Neil	Advanced Engineering Mathematics	Thomson, Canada.
2	Joel L.Schiff	The Laplace Transform	Springer Verlag, New York.
3	Shanti Narayan	Engineering Mathematics Vol. I & II	S. Chand & Company, New Delhi.

B) Web sites for references:

1. www.wikipedia.com
2. www.wolfarm.com
3. www.mathworld.com
4. www.nptel.iitm.ac.in

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE -1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Programming in 'C'

Course code: R14CP3401

Course Category: Core

Credits : 7

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	4	3	80	20	@25	-	50	175

@ Internal Exam

Rationale:

'C' is the most widely used computer language. 'C' is general purpose structural language that is powerful, efficient and compact, which combines features of high level language and low level language. Due to this inherent flexibility and tolerance it is suitable for different development environments. 'C' can also be used for developing complex algorithms in data structure and system level programming, to develop Operating system.

Objectives:

The student will be able to

1. Write algorithm and draw flowchart for a given problem statement.
2. Develop programs using input and output operations.
3. Use different looping and branching statements in programs.
4. Write programs based on arrays and string handling functions.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	1.1 Programming Fundamentals: Why study programming languages? Criteria for selection of a programming language, Attributes of a good language, structure of a typical language. 1.2 Algorithm and Flowchart: Concept of algorithm, symbols for flowchart, drawing flowchart for simple problem statements using conditional and looping structures, generalization of an algorithm, avoiding infinite loop. 1.3 Programming Languages: Machine language, Assembly Language, High-level language. High-level programming Language Tools: assembler, compiler, linker, interpreter. History of C, Characteristics of C, Structure of C program, Compilation and Execution of C programs, Environment for C.	8	12
2	2.1 Elements of C: C Character set, keywords (Reserved words), Identifiers, Escape sequences, Constants, Data types, Variable declaration, Rules for naming of variables, type casting.	6	12

	<p>Operators-arithmetic, assignment, relational, logical, increment/decrement operators, conditional operator, precedence and associativity of operators.</p> <p>Expressions: arithmetic, relational and logical expressions, Comments, Symbolic constants.</p> <p>2.2 Input-Output in C :</p> <p>Header files, conversion specification, Reading Input Data, Writing Output Data, escape sequences, formatted Input and Output for -Integer, Floating Point Numeric, and Format for string. Accepting character using getch (), getchar (), getche () functions.</p>		
3	<p>3.1 Sequence Control:</p> <p>Implicit and explicit sequence control, sequencing with arithmetic expressions</p> <p>Sequence control between statements: Basic statements, Forms of statement-level sequence control, Explicit sequence control, and Structured programming design, Conditional statements, Iteration statements.</p> <p>3.2 Control Statements: Branching in 'C':</p> <p>If statement, if-else statement, nested if-else statement, if-else-if ladder statement, switch-case statement.</p> <p>3.3 Control Statements :Looping in 'C':</p> <p>While statement, do-while statement, for statement, nesting of loops, Continue and break statement, Nested loops, goto statement.</p>	10	16
4	<p>4.1 Structured Data Types:</p> <p>Specification of data structure types, Operations on data structures, Implementation of data structure types: Sequential and linked representation, Operation on data structures and storage management.</p> <p>4.2 Arrays in 'C':</p> <p>Concept of Array, Defining array, Representation of array in memory.</p> <p>One Dimensional Array- Declaration of 1-D array, Initialization of array, accessing and processing 1-D array. Programs based on single dimensional arrays.</p> <p>Two Dimensional Array: Declaration, Initialization of 2-D array, accessing and processing of 2-D array, Simple programs based on 2-D array.</p>	10	16
5	<p>5.1 Character Strings:</p> <p>Specification and syntax, Declaration of String, Initialization of String, accepting string using scanf () and gets () functions, displaying string using printf() and puts() functions.</p> <p>5.2 String Library Functions – strlen(), strcpy(), strncpy() strcat(), strncat(), strcmp(), strcmp(), strev(),strupr(), strlwr(), Simple programs using string manipulation.</p>	7	12
6	<p>6.1 Introduction to Pointer:</p> <p>Concept of pointer, Declaration and Initialization of pointer variable, pointer to array, pointer to string.</p> <p>6.2 Testing and Debugging:</p> <p>Definition, difference between Testing and Debugging, Types of program errors, Testing a program, Debugging a program for logic error and syntax errors.</p>	7	12

Teaching Methodology: Chalk & Board, Discussion.

A) Term Work:

Skills to be developed:

i) **Life Skills :**

- Develop observation skills
- Develop Computer proficiency.
- Develop logical thinking ability.

ii) Intellectual Skills :

- Prepare algorithm for developing programs.
- Use programming language constructs for program implementation.
- Write and debug programs.
- Select appropriate programming language constructs.
- Identifying bug and testing a program for logical errors and syntax errors.

List of Practical/ Assignments/ Experiments:

1. Program to demonstrate use of printf() and scanf() statement.
2. Simple programs involving arithmetic, logical expressions.
3. Program using if-else control statement.
4. Program using if-else-if ladder statement.
5. Program using conditional operator.
6. Program using switch-case statement.
7. Program using for loop.
8. Program using do- while loop.
9. Program using nested for loops.
10. Program to find maximum and minimum element from array.
11. Program using two-dimensional array.
12. Menu driven program to manipulate strings.
13. Program to demonstrate use of pointer.
14. Program using pointer to array.

Professional Practices:

1. Search the information about the types of header files, keywords and their use.
2. Search information about the debugging approaches used in 'C' programming.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# S. K. Shrivastava	'C' in Depth	BPB Publication, 3 rd Edition
2	Terrence W. Pratt, Marvin V. Zelkowitz	Programming Languages, Design and Implementation	PHI pub. 3 rd Ed., 2001
3	E. Balagurusamy	Programming in ANSI 'C'	TMH, 4 th edition, 2009
4	Yashavant Kanetkar	Working with 'C'	BPB Publication, 2008
5	K.R. Venugopal	Mastering C	MC Graw Hill

Text book

B) Web sites for references:

1. <http://cprogramminglanguage.net/>
2. <http://www.cprogramming.com/tutorial.html>
3. <http://www.programmingsimplified.com/c>

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Computer Organization

Course code: R14CP3402

Course Category: Core

Credits : 4

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
4	–	3	80	20	–	–	–	100

Rationale:

This course deals with the fundamentals of organization of a computer system. It deals with the organization of various subsystems such as memory and I/O devices. It also deals with the design aspects of ALU, Control unit etc. The course prepares the base for the course on Operating System.

Objectives:

The students will be able to understand

1. The overall architecture of Computer system.
2. Design of ALU, CU.
3. Memory organization.
4. I/O handling.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	1.1 Introduction: Organization and architecture, structure and function of computer History of Computers: The First Generation – ENIAC, Von Neumann machine-Structure of IAS Computer, IAS memory formats, Instruction of IAS Computer, The Second Generation: Transistors, IBM 7094, the Third Generation- Integrated Circuits, microelectronics (fundamental Computer elements, relationship between Wafer, chip and gate), consequences of Moore's law, DEC PDP-8, The Later Generations -Semiconductor memory, Microprocessors. 1.2 The evolution of the Intel x86 Architecture.	10	12
2	Computer Arithmetic: 2.1 The Arithmetic and Logic Unit, Integer Representation-Sign Magnitude Representation and Twos compliment representation, Integer Arithmetic: Negation, Addition and Subtraction, Multiplication – Unsigned integers and Twos Complement Multiplication (using Booth's Algorithm), Division- Unsigned Binary Division. Floating Point Representation- Principles, IEEE standard for Binary Floating Point Representation.	11	12

	3.1 The Computer Function and Interconnection: Computer Components, Computer Function-Instruction Fetch and Execute (Basic Instruction Cycle), Instruction Cycle State Diagram, Instruction cycle with Interrupts. 3.2 Instruction Sets: Characteristics and Functions Machine Instruction Characteristics: Elements of a Machine Instruction, Instruction Representation, Instruction Types, Number of Addresses, Instruction Set Design, Types of Operands. 3.3 Processor Structure and Function Processor Organization, Register Organization: User-visible Registers, Control & Status Registers. Instruction Pipelining: Pipelining Strategy.	11	16
4	Control Unit: 4.1 Micro-operations: The Fetch, Indirect, Interrupt, Execute & Instruction Cycle. 4.2 Control of the Processor: Functional Requirements, Control Signals (Model of the Control Unit). Hardwired Implementation – Control Unit Inputs, Control Unit Logic 4.3 Micro programmed Control: Basic Concept- Microinstructions; Micro programmed Control Unit and its Advantages and Disadvantages.	11	12
5	Memory Organisation: 5.1 Cache Memory : Computer memory system overview: characteristics of memory systems, memory hierarchy. Cache Memory Principles, Elements of Cache Design: cache addresses, cache size. 5.2 Internal Memory: Semiconductor Main Memory: organization, DRAM and SRAM, Types of ROM (PROM, EPROM, EEPROM, Flash memory) 5.3 External Memory: Magnetic Disk: Magnetic read and write mechanism, Data organization and Formatting, physical characteristics, Disk Performance Parameters. Optical Memory—Compact Disk, Digital Versatile Disk (DVD), High Definition Optical Disks.	11	16
6	6.1 Input / Output: Generic Model of an I/O Module, I/O Modules-Module Function, I/O Module Structure. Programmed I/O: Overview, I/O Commands, and I/O Instructions (I/O mapped I/O and memory mapped I/O). Interrupt-Driven I/O: Interrupt Processing, Design Issues. Direct Memory Access: Drawbacks of Programmed and Interrupt-Driven I/O), DMA Function. I/O Channels and Processors- The Evolution of the I/O Processors, Characteristics of I/O Channels, Types of Interfaces (Only concept of serial and parallel I/O) 6.2 Parallel Processing: Multiple Processor Organizations- types of parallel processor systems, Parallel Organizations.	10	12

Teaching Methodology: Chalkboard, Discussion, Transparency

Skills to be developed:

i) Intellectual Skills:

- Understand the architecture of computer system.
- Solve binary arithmetic.
- Know different types of instruction cycles and their micro-operations.
- Compare computer generations.
- Understand memory organization and I/O concepts.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	#William Stallings	Computer Organization & Architecture Designing for Performance.	Pearson, Eight Edition, 2003
2	#John P. Hayes	Computer Architecture & Organization	Tata McGraw HILL Publication, Third Edition, 2001
3	Hennessy Patterson	Computer Architecture	Denise E.M.Penrose, Fourth Edition 2007

#: Text Books

B) Web sites for references:

1. www.williamstallings.com/COA8e.html
2. www.expedition.cs.uic.edu
3. <http://engineeringppt.blogspot.com/2009/08/computer-architecture-and-organization.html>

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Operating Systems

Course code: R14CP3403

Course Category: Core

Credits : 4

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
4	-	3	80	20	-	-	-	100

Rationale:

Operating systems provide an interface between the user and computer systems. It is the first piece of software to run on computer systems when it is started. It provides different services for execution of application software. Its knowledge is essential for every computer engineer to understand the management of various resources in computer system. This course is foundation for study of courses like Network Administration, Unix System Administration etc.

Objectives:

The student will be able to

1. Understand the various features and functions of Operating System.
2. Understand the concept of process, deadlock & the concept of context switching and multiprogramming and also the concept of inter-process communication.
3. Understand the concept of memory management and file management techniques.
4. Understand the tools and the components of the operating system.
5. Understand the concept of security and protection.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	Introduction: 1.1 Introduction to OS- Definition of OS, Role of Operating system in computer, Operating system services. Evolution of Operating System (Processing)- Serial Processing, Batch processing, Multiprogramming. Types of Operating System- Batch Operating System, Multiprogramming Operating System, Time sharing systems, Real time systems, Distributed System. Different views of Operating System - Command language user's view and System calls user's view 1.2 Concepts and structure of Operating System: Processes, files, Shell, System calls. Different structures of Operating System- Monolithic Systems, Layered Systems, Exokernel, Microkernel, Client- Server Model, Virtual Machines.	10	12
2	Processes And Processor Management: 2.1 Process Concept: Operating system view of process- Process, Process State transition, Process Control block, process switch, Operating system services for	10	12

	<p>process management; Threads, Multithreading model</p> <p>2.2 Process scheduling: Scheduling Queue, Types of scheduler, Context switch, CPU I/O Burst Cycle, Scheduling Criteria. Scheduling algorithms- FCFS, SJF, Priority Scheduling, Preemptive and non-preemptive scheduling (SJF and Priority), Round Robin Scheduling, Multilevel Queue Scheduling, Multilevel Feedback Queue Scheduling.</p>		
3	<p>Process Coordination- 3.1 Interprocess Communication: Shared Memory System, Message Passing System- Naming, Synchronization, Buffering. 3.2 Race Condition, Critical Regions, and Mutual Exclusion- Mutual Exclusion with Lock variable, TSL instruction, Peterson's Solution. 3.3 Classical Problems in Inter-process Communication: Producer-Consumer Problem, Readers-Writers Problem, Dining Philosopher Problem. Semaphore, monitor Semaphore, Monitors. 3.4 Deadlock: Necessary conditions to occur deadlock, Deadlock Prevention, Deadlock Avoidance, deadlock recovery, deadlock detection and recovery.</p>	12	16
4	<p>Memory Management : 4.1 Basic hardware, Address binding, Protection, logical vs. physical address space. Swapping. 4.2 Continuous allocation : MFT (Static allocation) - Allocation strategies, Fragmentation. MVT (Dynamic Allocation)- Allocation strategies, Fragmentation, Compaction. Free space management techniques - Bit maps and linked list. 4.3 Non- Contiguous allocation: Paging- Address translation, Hardware support (TLB) , Protection and sharing. Segmentation- Basic method, hardware. Virtual memory management- Demand paging, page replacement, Page replacement algorithms- (FIFO, Optimal, and LRU).</p>	12	16
5	<p>File Management : 5.1 File Concepts-Attributes, Operations, Access Methods. 5.2 Directory structure- Single level, Two level, tree structured, Acyclic Graph Directory, General graph directory, Directory Operations; Disk space management- Continuous, Linked, Indexed. 5.3 Protection – Types of access, access control</p>	10	12
6	<p>6.1 System Protection: Goals and Principles of protection, Domain of protection, Access matrix and implementation, Access control, revocation of access rights. 6.3 Security: The Security problem, Program threats, System and network threats, Cryptography- encryption , authentication, key distribution, User Authentication- Password, Encrypted password, one-time password, biometrics.</p>	10	12

Teaching Methodology: Chalkboard, Discussion, Power Point Presentation

Skills to be developed:

i. Intellectual Skills:

- Understand the scheduling algorithms and solve the related problems.
- Identify the problem/ limitations associated with algorithm and find the solution.

Learning Resources:

A) Books:

SR. NO.	TITLE	AUTHOR	PUBLISHER
1	# Operating System Concepts	Silberschatz, Galvin and Gagne	Wiley India Pvt. Ltd., 7 th Edition, 2006
2	# Modern Operating Systems	Tannenbaum A. S.	Prentice Hall of India, 2 nd Edition.
3	Operating Systems: concept and Design	Milan Milenkovic	McGraw Hill, 2 nd Ed, 2001.
4	Operating Systems	Achut S. Godbole	Tata McGraw Hill, 2 nd Edition, 2005

#: Text Book

B) Web Sites for References:

1. <http://www.os-book.com/>
2. <http://williamstallings.com/OS/OS5e.html>
3. <http://www.deitel.com/books/os3e/slides.html>
4. <http://www.nptel.iitm.ac.in/>

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE -1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Data Structures

Course code: R14CP3404

Course Category: Core

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	-	25	50	175

Rationale:

This course is a continuation of 'Programming in C' course, and provides students an opportunity to further develop and refine their programming skills. In particular, the emphasis of this course is on the organization of information, the implementation of common data structures such as lists, stacks, queues, trees, and graphs. It also explores the close relationship between data structures and algorithms. Student also considers complexity of algorithm while developing program logic.

Objectives:

The student will be able to

1. Compare the efficiency of various sorting algorithms in terms of both time and space.
2. Demonstrate understanding of abstract properties of various data structures such as array, stack, queue, linked list, trees and graphs.
3. Use various data structures effectively in application programs.
4. Implement various data structures in more than one manner.
5. Compare different implementations of data structures and to recognize advantages and disadvantages of different implementations.
6. Demonstrate the understanding of various sorting techniques including bubble sort, insertion sort, selection sort and quick sort.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	1.1 Introduction to Data Structures : Definition, need and advantages, basic terminology, linear and non linear data structures, static and dynamic data structure, operations on data structures. 1.2 Analysis of Algorithm: Different approaches to design an algorithm. Analysis of an algorithm, Time complexity, space complexity, time-space tradeoff, Big O notation.	8	12
2	2.2 Searching : Basic search techniques, Linear search algorithm, its limitation, binary search algorithm, its advantage over linear search; Concept of hashing. Analysis of each searching technique for best, worst and average	8	12

	<p>case.</p> <p>2.3 Sorting : Concept of Internal and External sort. Sorting algorithms – Selection sort, Bubble sort, Insertion sort, Merge sort, Radix sort, Quick sort. Analysis of each sorting technique.</p>		
3	<p>2.1 Stack : The structure of stack, working of stack, push and pop operation, conditions for stack overflow and underflow, applications of stack, implementation of stack using array in 'C'.</p> <p>2.2 Queue : Linear queue: The structure and working of linear queue, store and retrieve operations, overflow and underflow conditions, limitation of liner queue, applications, implementation using array in 'C', Circular queue: The structure and working of circular queue store and retrieve operations, advantage of linear queue, implementation using array in 'C'.</p> <p>2.3 Applications of Stack and Queue : The infix, prefix and postfix expressions, algorithm for conversion of infix to prefix and postfix, algorithm for evaluation of postfix expression.</p>	8	16
4	<p>4.1 Linked List: Structure of linked list, self referential structures, representation of a node in a linked list using structure, operation on linked list – traversal, insertion, deletion, search, advantages of linked lists over arrays.</p> <p>4.2 Types of Linked List and their Implementation: Linear linked list, Circular linked list, Doubly linked list: Representation in memory, structure of a node and different operations performed on them.</p> <p>Comparison between SLL, DLL, CLL. Algorithms and program to implement LL, DLL, CLL in 'C'.</p>	10	16
5	<p>5.1 Binary Tree: Introduction, general tree, binary tree and its definition, Terminology (tree sub-tree, root leaf (node), left, right, parent, child, ancestor, descendant, brother, level, depth).representation of binary tree in memory, structure of a node in binary tree, traversal of binary tree in inorder, preorder and postorder, algorithm to find depth of a binary tree, Expression tree.</p> <p>5.2 Binary Search Tree : Structure of binary search tree, use of binary search tree, traversal of binary search tree in inorder, preorder and postorder, algorithm for creation of binary search tree.</p> <p>5.3 Searching in Tree: Depth first search algorithm, searching for a node in binary search tree, Breadth first search algorithm.</p>	6	12

6	<p>6.1 Graph Definition, Terminology: graph, node (vertices), arcs (edge), directed graph, in-degree, out-degree, adjacent nodes, successor, predecessor, weight, path, length, cycle, loop, parallel edges. Types of graphs: Directed graph, directed acyclic graph (DAG), directed cyclic graph, weighted graph, connected graph, isolated graph, strongly connected graph, multi-graph, un-directed graph .</p> <p>6.2 Representation of Graph in Memory: Sequential representation of graph using adjacency matrix and path, linked representation of graph. Operations on graphs – algorithm for depth first search (DFS) and breadth first search (BFS) on graph. Algorithm to find path matrix-using power's of A, algorithm to find shortest path-Warshall's algorithm.</p>	8	12
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Teaching Methodology: Chalkboard, Discussion

A) Term Work:

Skills to be developed:

iii) Life Skills :

- Develop observation skills.
- Develop Computer proficiency.
- Develop logical thinking ability.

iv) Intellectual Skills :

- Prepare algorithm for developing programs by considering time complexity..
- Implement data structures using programming language construct.
- Write and test programs.
- Select appropriate programming language constructs.

List of Practical/ Assignments/ Experiments:

1. Program to implement linear search and binary search.
2. Menu driven program for insertion sort, bubble sort, selection sort.
3. Program to implement stack.
4. Program to implement linear queue.
5. Program to implement circular queue.
6. Implementation of linear linked list.
7. Implementation of circular linked list.
8. Implementation of doubly linked list.
9. Implement stack/queue as a linked list.
10. Creation of binary tree and traversal using recursive functions.
11. Creation of binary search tree and traversal using recursive functions.

Professional Practices:

- Implement a data structure (Linked List) to maintain student/ employee / Book records with following operations: Add, delete, search, modify, and display records.

Learning Resources:**A) Books:**

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	#Tannenbaum, Langsman, Augenstein	Data Structure using C	PHI Publications, 2 nd Edition, 2007
2	#Lipschultz	Data structures	Schaum's Outline Series, TMH, 2008
3	Horowitz E., Sahni S.	Fundamentals of Data Structures	Galgotia publishing company, New Delhi, 3 rd Edition, 2008
4	Behrouz A. Forouzan	Data structures	Cengage Learning

Text Books

B) Web sites for reference:

1. [http:// www.academictutorials.com/data-structure/](http://www.academictutorials.com/data-structure/)
2. <http://www.datastructures.info>
3. <http://academicearth.org/courses/data-structures>
4. http://www.algolist.net/Data_structures/
5. <http://www.csse.monash.edu.au/~dwa/Animations/index.html>

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	1.1 Introduction to Object Oriented Programming : Its need and requirements , Procedure –oriented programming versus Object-Oriented programming ,Basic concepts of OOP's , Object oriented languages 1.2 Beginning with C++ : Simple C++ program, structure of C++ program , tokens , identifiers , keywords , variables, constants , data-types-basic and derived, control structure , functions, function prototype, inline functions 1.3 Objects and Classes : Defining a class, defining data members and member functions, arrays within a class, creating objects, memory allocation for objects, static data members and static member function, array of objects. Objects as function arguments, pointers to members , friend functions	10	16
2	2.1 Constructors and Destructors : Concept of constructor , types of constructor- Parameterized , multiple constructors in a class , constructor with default arguments , Dynamic constructor , Destructors 2.2 Operator Overloading: Operator overloading and type conversions , function overloading, Overloading unary and binary operators , Rules for overloading operators	7	12
3	3.1 Inheritance : Introduction , Derived classes, single Inheritance, inheriting private members, Member declaration: protected, public and private , member accessibility and visibility modes Types of inheritance: Single, Multilevel, Multiple, Hierarchical, Hybrid, Multipath inheritance, Virtual base classes, Abstract Classes, Constructors in derived classes.	7	12
4	4.1 Polymorphism : Introduction, Polymorphism in programming languages, types of polymorphism, static and dynamic binding, function overloading and overriding, virtual functions- need, definition, rules, and pure virtual function. 4.2 Exception Handling: Introduction , Basics of Exception Handling, Exception handling mechanism , throwing and catching mechanism	7	12
5	5.1 I/O system basics: The stream classes, console stream classes, unformatted I/O- put(), get(), getline(), write(), formatted I/O using ios class functions , flags and manipulators 5.2 File–Handling: File system Basics , Opening and closing a file , use of constructors , Reading and writing a character from a file using get() and put(), File modes & pointers , Block I/O using read() and write() , error handling for files	9	16
6	Templates : Introduction, Class Templates, General format of class template and its	8	12

	definition, Class template with multiple parameters, Function templates, Syntax of Function template, Function templates with two generic types.		
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Teaching Methodology: Chalkboard, Discussion, and Power Point Presentation.

A) Term Work:

Skills to be developed:

i) Intellectual Skills:

- Understand OOPs concepts.
- Selection of appropriate constructor.
- Write programs which implements OOPs concepts.
- Interpretation of code and result.
- Test and debug the programs.

List of Practical:

1. Program to define a class and create an object of a class.
2. Program to create & manipulate array of objects
3. Program using static member variables.
4. Program for passing object as an argument to function.
5. Program using constructor & destructor functions in class.
6. Program having constructor with default arguments.
7. Program for overloading unary & binary operators
8. Program for implementation of single & hierarchical inheritance.
9. Program to implement multiple inheritance.
10. Program for function overloading.
11. Program for function overriding.
12. Program for implementation of polymorphism using virtual function.
13. Program using pointer to object and array of objects.
14. Program for string manipulation using pointer to string.
15. Program using this pointer.
16. Program using manipulators to format output.
17. Program for file – writing to file and reading the contents of file
18. Program for file copy
19. Program using template.

Professional practices:

1. Mini project which incorporates more than one OOPs features.

Learning Resources:

A) Books:

SER. NO.	AUTHOR	TITLE	PUBLISHER
1	# E. Balagurusamy	Object Oriented Programming with C++	TMH, New Delhi, 6 th Ed. 2013, ISBN:9781259029936
2	Venugopal K.R., Rajkumar	Mastering C++	TMH New Delhi, 2002
3	Herbert Schildt	C++: The Complete Reference	TMH, New Delhi, 3 rd Ed., 1999

Text book

B) Web sites for references:

1. www.gillius.org/ooptut/index.htm
2. www.gnacademy.org/text/cc/
3. www.webopedia.com/TERM/O/object_oriented_programming_OOP.html
4. www.cs.ucsc.edu/~pohl/oop.htmlcs193d.stanford.edu/
5. www.cplusplus.com/doc
6. www.exforsys.com/tutorials/c-plus-plus/

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE -1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Database Management Systems

Course code: R14CP3406

Course Category: Core

Credits : 7

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	4	3	80	20	25	-	50	175

Rationale:

Database management has evolved from a specialized computer application to a central component of a modern computing environment. Knowledge about database systems has become an essential part of an education in computer science. Organizations are employing mechanisms to effectively manage and utilize data stored in the databases. The Database Management System is a collection of programs that enables to store, modify and extract information from a database. This course includes aspects of database design, database languages, and database system implementation.

Objectives:

Students will be able to

1. Understand the concept of database systems.
2. Create database, modify, and append data.
3. Write Logical and conditional statements for database query.
4. Normalize database to normal forms.
5. Write PL/SQL block of code.
6. Write procedures and functions.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	1.1 Introduction: What is DBMS? Database System Applications, Purpose of Database Systems. View of Data –Data Abstraction, Instances and Schemas, Data Models. Database Languages --Data Definition Language, Data Manipulation Language. Data Storage and Querying: Storage Manager, The Query Processor. Database Architecture, Database Users and Administrator - Database Users and User Interfaces, Database Administrator. 1.2 Entity-Relationship Model: Entity sets, relationship sets, attributes. Constraints-- Mapping Cardinalities, Participation constraints, Keys. Entity-relationship diagrams: Basic Structure, Mapping Cardinality, Complex Attributes, Roles, Nonbinary Relationship Sets, Weak Entity Sets.	8	16

2	<p>2.1 Structured Query Language (SQL):- Overview of SQL, Data Types in Oracle, Sublanguages of SQL-Data Definition Language (create, alter, truncate, drop), Data Manipulation Language (insert, select, update, delete), sorting of data, aggregate functions, grouping data from tables (Group by and having clause), and SET operators in oracle (Union, Intersect, Minus), Oracle transactions.</p> <p>2.2 Security & Integrity Security management in SQL- granting and revoking permission. Concept of Authorization. Encryption and its Applications – Encryption Techniques, Encryption support in databases, Encryption and Authentication.</p>	8	12
3	<p>3.1 Integrity Constraints : Integrity constraints, Types of integrity constraints:-1) Domain integrity constraint 2) Entity integrity constraint 3) Referential integrity constraint,</p> <p>3.2 Relational Database Design Pitfalls in relational database design, Functional Dependencies, Normalization, Types of Normalization 1NF, 2NF, 3NF, BCNF.</p>	10	12
4	<p>4.1 Procedural Language/Structured Query Language (PL/SQL) : Introduction to PL/SQL, advantages of PL/SQL, the generic PL/SQL block, PL/SQL execution environment, character set, literals, PL/SQL data types, variables, constants, logical comparisons, displaying user messages, comments, control structures (conditional, iterative, sequential). Error handling in PL/SQL, oracle's named exception handlers: user-named exception handlers, user defined exception handling (For Business Rule Validations).</p> <p>4.2 Cursors: Cursor: what is cursor? Types of cursor and their attributes-Implicit and Explicit Cursors (attributes: %isopen, %found, %notfound, %rowcount), cursor for loops, parameterized cursor.</p>	6	16
5	<p>5.1 PL/SQL Database Objects (Procedures and Functions): What are Procedures/ Functions? Where do stored procedures and functions reside? How does the oracle engine execute procedures/ functions? Advantages and disadvantages of using procedure and functions, procedures and functions syntax, deleting stored procedure and function. Programs based on procedures and functions.</p> <p>5.2 Transaction And Concurrency Control : Transaction Concept (ACID Properties), Transaction Atomicity and Durability (Transaction State Diagram), Transaction Isolation, Introduction to Locks. Deadlock Handling – Deadlock Prevention, Timeout-Based Schemes. Deadlock Detection and Recovery—Deadlock Detection, Recovery from Deadlock.</p>	8	12
6	<p>6.1 Database System Architecture : Centralized and Client - Server Architectures—Centralized Systems, Client Server Systems Server System Architectures –Transaction Server, Data Servers. Distributed Systems- Concept and its advantages and disadvantages.</p>	8	12

	6.2 Distributed Databases : Homogenous and Heterogeneous Databases Distributed Data storage-- Data replication, Data fragmentation, Transparency. Distributed Transactions—System Structure, System Failure Modes. 6.3 Introduction To Data Warehousing and Data Mining and Information Retrieval.		
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Teaching Methodology: Chalkboard, Discussion, and Power Point Presentation

A) Term Work:

Skills to be developed:

i) Intellectual Skills :

- Select appropriate SQL instructions for given application .
- Design database for given application.
- Write SQL queries.
- Select appropriate DBMS for given application.

List of Practical /Assignments / Experiments:

Note: Use Oracle and MySQL to carry out the assignments.

1. Use of DDL commands.
2. Use of DML commands.
3. Use of Integrity constraints.
4. Use of TCL commands.
5. Creation of user and granting permissions (DCL Commands).
6. Use of arithmetic and, logical operators.
7. Use of comparisons operators.
8. Use of single group functions (character functions).
9. Use of single group functions (numeric functions).
10. Use of single group functions (date functions).
11. Use of aggregate function.
12. Use of group by, order by and having clause.
13. Use of all set operators.
14. Use of all types of join.
15. Use of conditional and iteration statements in PL/SQL.
16. Use of Exceptions in PL/SQL.
17. Use of Implicit and Explicit cursor.
18. Use of cursor for loop and parameterized cursor in PL/SQL
19. Use of Procedures in PL/SQL.
20. Use of Functions in PL/SQL

Professional Practices:

1. Find information about the various database management systems available and their features
2. Find Information about E. Todd's laws for a fully functional Relational Database Management System.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Abraham Silberschatz, Henry F. Korth, S. Sudarshan	Database System Concepts	Tata Mc-Graw Hill Publications, 6 th Edition, 2005
2	Jeffrey D. Ullman	Principles of Database System	Galgotia Publication, 3 rd Edition, 2007
3	Ivan Bayross	SQL, PL/SQL – The Programming language of Oracle. 4 th Revised Edition	BPB Publications, 4 th Edition, 2009 (Reprinted 2011).
4	Ivan Bayross	ORACLE DEVELOPER 2000 (First Edition)	BPB Publications, 2008
5	Vikram Vaswani	MySQL : The Complete Reference	Tata Mc-Graw Hill Publications, 1 st Edition, 2004
6	Vikram Vaswani	MySQL database usage and Administration	Tata Mc-Graw Hill Publications, 1 st Edition, 2009

B) Web sites for references:

1. www.codex.cs.yale.edu
2. www.oracle.com/technology/index.html
3. www.dbms.ca/
4. www.oracle.com/technology/index.html
5. www.mysqltutorial.org
6. www.dev.mysql.com/doc/refman/5.0/en/tutorial.html
7. www.tutorialspoint.com/mysql

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME IN: COMPUTER ENGINEERING

Course : Computer Networks

Course Code: R14CP3407

Course Category: Core

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	-	-	50	150

Rationale:

The earlier picture of single computer serving all the roles in an industry or any other application field has been replaced by network of computers. A **computer network** is an interconnection of a group of computers for sharing of data, resources etc. The course contents included in this subject such as network design, LAN implementation, network components, various layer protocols, IP address mechanism, DNS configuration, and Network Security help students to understand the basic concepts of networking and design the network as per requirements.

Objectives:

The student will be able to

- i] Compare network classes
- ii] Describe network components
- iii] Compare types of topologies
- iv] Understand various protocols implemented in network
- v] Configure TCP/IP protocol

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
01	Introduction : 1.1 Computer network, need & application. Classification of network by their component role: Peer to Peer, Client- Server, Internet connectivity requirements and setup 1.2 LAN,MAN,WAN Wi-Fi, WiMAX 1.3 Network Topology - Bus topology, Ring topology, Star topology, Mesh Topology, Hybrid Topology 1.4 Network components: Hub, switch, types of switches, router, bridge, repeater, gateway, modem, Wireless devices	6	12
02	Local Area Network : 2.1 Architecture of LAN : Project 802 Ethernet, Access method (CSMA/CD), Electrical specification, Ethernet frame format 2.2 Implementation-Thick Ethernet(10 Base 5), Thin Ethernet(10 Base 2) Fiber Distributed Data Interface (FDDI)	8	16

	2.3 Ethernet Networks: Switched Ethernet, Fast Ethernet, Gigabit Ethernet, Converged Ethernet Advantages & disadvantages of each. 2.4 Wireless LAN Standards : IEEE 802.11,HiperLAN,Bluetooth		
03	Data link and Network Layer Protocols : 3.1 Design issues of data link layer, Services provided to the network layer, Framing, Error control ,flow control, congestion control schemes-Leaky bucket algorithm 3.2 Data link layer protocols-stop and wait, sliding window Go Back N , Selective Repeat 3.3 HDLC : Station Types, Configurations, Modes of Communication, and Frames PPP : PPP Layers, Link Control Protocol, Authentication, CHAP. 3.4 IP : IP Datagram,Version,Service Type, Identification, Flags TTL, Protocol Header, Checksum, Options. IPv6 introduction, Neighbor Discovery Protocol, difference between IPv4 and IPv6 ARP : ARP Introduction, Structural Diagram, ARP Process RARP : RARP Introduction, RARP Process	10	16
04	Transport and Application Layer Protocol 4.1 TCP : Introduction to ports, sockets, TCP Service Model, TCP Protocol, TCP Segment Header. 4.2 UDP : UDP Datagram, UDP Datagram Format, UDP Datagram Fields, Comparison of TCP and UDP 4.3 SMTP : User Agent, Mail Transport Agent, Multipurpose Internet Mail Extension(MIME),Post Office Protocol(POP) 4.4 SNMP : Components, Messages 4.5 FTP : Basic Model of FTP, Process	8	12
05	IP Addressing and DNS 5.1 IP address structure , classes of IP address, IPv6 5.2 Routing Protocols-RIP,OSPF 5.3 Subnet, subnet addressing and address masking 5.4 DHCP, address pool, address leasing 5.5 DNS Architecture, DNS name space generic domains 5.6 Domain name resolution & mapping to physical addresses	8	12
06	Network Security 6.1 Network Security : Aspects of Information Security, Wireless Security, Security Attacks, Intrusion Detection System 6.2 Cryptography, Types of Ciphers : Substitution & Transposition Cipher, key management, SSL introduction 6.3 Encryption : Encryption Model, data encryption standard Digital Signature: Symmetric key algorithm, public key algorithm, message digest 6.5 Firewall, Virtual Private Network (VPN)	8	12

Teaching Methodology: Chalk Board, Discussion, Power Point Presentation, Industrial visits

A) Term Work :

Skills to be developed:

i) Life Skills :

- Search information from various sources
- Develop presentation skill
- Write report for given task/work/project

i) Intellectual Skills:

- Select suitable equipment for networking
- Interpret various commands

ii) Motor Skills:

- Make proper connection for networking
- Installation of software

List of Practical/Assignments:

1. Design of a network for computer laboratory
2. Case study of internet connectivity requirements, setup, and network control devices.
3. Design a network on given topology and implement it on network simulator
4. Design a network to observe congestion problem using network simulator
5. Design a network to find best suitable path in case of link failure.
6. Design wireless network and observe the performance.
7. Design a network to observe GPRS performance.
8. Design optical network and observe the performance.
9. Capture the packets using wireshark and study protocol format.

Professional Practices:

1. Implement various network commands
2. Crimping of cable for peer to peer network
3. Present a seminar related to networking technologies and applications.

Guest Lectures on following Topics:

- Cyber Laws
- E-commerce

B) Field Work:

1. Guided Industrial visit. (Guidelines may change with respect to Industry type.)

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# A.S.Tanenbaum	Computer Networks	PHI,4 th Ed;2002
2	# Behrouz A. Forouzan	Data Communication and networking (2 nd Edition)	TMG,2 nd Ed;2003
3	William Stalling	Network Security Essentials	PHI,3 rd Ed;2006

#Text Book

B) Software:

Estinet 8.0 Network Simulator and Emulator

C) Web sites for reference:

1. <http://www.cse.iitk.ac.in/users/dheeraj/cs425/index.html>
2. www.networktutorials.info
3. <http://www.mhhe.com/engcs/compsci/forouzan/dcn/student/olc/>
4. www.datacottage.com

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Microprocessors and Programming

Course code: R14CP3408

Course Category: Core

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	—	@25	50	175

@ Internal Exam

Rationale:

Microprocessor is brain of computer. Intel family is widely used all over the world. The 8085 is the 8-bit CPU and the 8086 is the 16-bit CPU. The 8086 is base of all later developed processors. It is more powerful and efficient computing machine. It overcomes all major limitations of the previous processors. It can be interfaced with 8-bit, 16-bit peripheral systems. This subject covers architecture of 8086, 80386 and Pentium processor with instruction set and assembly language programming of 8086. It also covers interfacing with memory devices. This will act as foundation for the courses like PC Maintenance.

Objectives:

The student will be able to: -

1. Draw the architecture of 8086.
2. Describe concepts of pipelining, segmentation and address generation.
3. Know support chips.
4. Design interface of memory chips.
5. Write syntax of given instructions.
6. Write program in 8086 assembly language.
7. Understand about Pinout of 8086.
8. Definition of various interrupts.
9. Know about advance processors: 80386, 80486 and Pentium, i₃, i₅, i₇.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	Architecture Of 8086 : Introduction - Overview of 8 bit processor and limitations , Introduction to 16 bit processor- Features of 8086, Internal architecture, Pin-out of 8086, functions/significance of various pins/control signals, register organization, flag register format of 8086 and its description, Physical address calculation, concept of segmentation and advantages, Maximum & minimum mode modules of 8086, comparison with 8088.	6	12
2	Support Chips And Interfacing : Block diagrams of octal latch(8282), octal bus transceiver (8286 / 8287), clock generator (8284) & Bus controller (8288), programmable peripheral interface (8255), organization and pins of RAM & ROM, Memory mapping of 8086, Memory banking, interfacing of RAM & ROM with 8086, concept of decoder- full,	9	16

	partial & PROM decoder, Interfacing of DAC and stepper motor.		
3	8086/8088 Instruction Set and Assembler Directives : Program development steps, Program development tools, Machine Language Instruction Formats, Addressing modes of 8086 - immediate,direct,register,register indirect, indexed, register relative, Based indexed,intersegment,intrasegment, Instruction set of 8086/8088, Assembler directives and operators, Writing program for use with an assembler	10	16
4	Assembly Language Programming Techniques : Jump & While - Do, Repeat - Until implementation, Debugging assembly language programs. If - Then, If - Then - Else & nested If - Then - Else implementation, CALL, JMP instructions, Macros-Defining a MACRO, Passing Parameters to a MACRO, Writing & using macros.	9	12
5	Interrupts and Interrupt Service Procedures : 8086 Interrupt Types:Predefined,Software & Hardware interrupts, internal and external interrupts, Handling INTR interrupt, CPUs response to interrupt, Priority of the interrupts, Structure of Interrupt vector location table (IVT). Interrupt Programming - near, far ,PROC.	7	12
6	Architecture Of 80386 and Pentium : Features of 80386DX, Architecture of 80386, Register Organization, Data types, Addressing modes, operating modes: Real, Protected & VM 86 modes in detail, Segmentation-descriptor tables and descriptors structure, Paging-Paging operation, paging unit, descriptor base register, page tables, Conversion of Linear address to Physical address, Features of Pentium, block diagram and its description, Introduction to multicore processors and salient features of i3, i5, i7 processors.	7	12

Teaching Methodology: Chalkboard, Power Point Presentation, Video and Transparency.

A) Term Work:

Skills to be developed:

i) Intellectual skills:

- Understand the working of different processors.
- Discrimination between high level language and assembly language.
- Understand the assembly language program development steps.
- Write assembly language programs.
- Understand use of MASM software.
- Compile, link and debug the assembly language programs.
- Analysis and interpretation of result.

List of Practicals/Experiments/Assignments (any Twelve):

1. To add two 16 bit numbers.
2. To add series of 16 bit numbers.
3. To subtract two 16 bit numbers.

4. To multiply two 8 bit unsigned numbers.
5. To Multiply two 16 bit unsigned numbers.
6. To multiply two 16 bit signed numbers.
7. To divide 16 bit unsigned number by 8 bit unsigned number.
8. To divide 32 bit unsigned number by 16 bit unsigned number.
9. To divide two 16 bit unsigned numbers.
10. To divide two 16 bit signed numbers.
11. To add two BCD numbers.
12. To add two ASCII numbers.
13. To find largest among block of data.
14. To find smallest among block of data.
15. To arrange numbers in ascending order.
16. To arrange numbers in descending order.
17. Count even/odd data elements in a given string
18. Count positive/negative data elements in a given string
19. Data block transfer using string instructions.
20. Searching target data in a given string
21. Compare two strings using string instruction.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# A. K. Ray, K. M. Bhurchandi	Advanced Microprocessors and Peripherals- Architecture, Programming and Interfacing	Tata Mc-Graw Hill, 3 rd Edition, 2012. ISBN:9781259006135
2	# Douglas Hall	Microprocessor & Interfacing Programming & Hardware	Tata Mc-Graw Hill Eleventh Print 2001.
3	Barry B. Brey	The Intel Microprocessor : 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium & Pentium Processor, Architecture, Programming & Interfacing	Prentice Hall of India, 7 th Edition.
4	Peter Abel	Assembly Language Programming	Prentice Hall of India Second Edition 1994.

B) Softwares:

Masm.

C) Web sites for references:

1. www.cpu-world.com/Arch/8086.html
2. www.penram.com
3. www.vlsibank.com
4. www.intel.com
5. www.analog.com/embedded-design
6. www.slideshare.net/.../intel-core-i3-i5-i7-core2-duo-and-atom-processors

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE - 1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Software Engineering

Course Code: R14CP3409

Course Category: Core

Credits : 6

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
4	2	3	80	20	--	--	50	150

Rationale:

This course is intended to provide the students with an overall view of Software Engineering with insight into the processes of software development. Software Engineering is the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software. The discipline of Software Engineering encompasses knowledge, tools, and methods for defining software requirements, and performing software design, software construction, software testing, and software maintenance tasks.

Objectives:

The students will be able to

1. Understand steps in program development.
2. Make feasibility study.
3. Understand how to make time and budget estimation for software project.
4. Understand how to make project management estimation in terms of Human resources, Hardware resources, Software resources, Reusability.
5. Draw Data Flow Diagrams and understand their importance.
6. Understand software testing and debugging techniques.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	Introduction to software Engineering: The evolving role of software, Software characteristics, Software applications, Software myths. Generic view of software engineering, Process models – Waterfall model, Incremental process model, RAD model; Evolutionary software process models – Prototyping, Spiral model, Concurrent development model; Specialized Process Models, Personnel and Team Process models; Agile process models - Agile process models, Extreme programming.	11	12
2	Requirement Engineering:	12	16

	<p>Requirement engineering, Initialing the process, Eliciting requirement, Building the Analysis Model, Negotiating, Validating requirements.</p> <p>Building Analysis Model: Analysis Modeling Approaches- Data modeling Concept, Object Oriented Analysis, Scenario-Based Analysis, Requirements Modeling strategies, Flow-Oriented Modeling, SRS.</p>		
3	<p>Design Engineering: Design Process, Design concepts (Abstraction, Modularity, Information hiding, Functional Independence, Refinement), Design model (Data Design, Architecture Design, Interface Design, Component level Design);</p> <p>Software architecture- Control Architecture, Structural Partitioning, Functional Independence (Cohesion and Coupling).</p> <p>Architectural styles: Data centered architectures, Data flow architectures, Call and return architectures, Object oriented architectures, layered architectures.</p>	9	12
4	<p>Software Testing Techniques: A strategic approach to software testing, strategic issues, test strategies for conventional software and Object oriented software, validation testing, system testing, The art of debugging.</p> <p>Testing Tactics- Software testing fundamentals, White box testing, basis path testing, Control structure testing, Black box testing.</p> <p>Software Quality Assurance- SQA activities, Software Reviews, Formal Technical Review.</p>	12	16
5	<p>Process and project Metrics: Metrics in process and project domains, software measurement metrics for software quality,</p> <p>Estimation for software project: project planning process, software scope and feasibility, resources, Decomposition Techniques, Empirical Estimation Models, Estimation for Object Oriented project, Make by decision.</p>	10	12
6	<p>Risk Management: Reactive versus proactive Software Risk, Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation, Monitoring & Management, The RMMM plan.</p> <p>Project Scheduling: Basic Principles, Defining task set for software project, defining a task network, scheduling (Timeline chart, Tracking the schedule).</p> <p>Software Configuration Management: Software Configuration Management, SCM Repository, SCM process.</p>	10	12

Teaching Methodology – Chalkboard, Discussion, Power Point Presentation.

A) Term Work:

Skills to be developed:

i) Life Skills :

- Develop observation skills.
- Search information from various sources .
- Work as a member of team.

ii) Intellectual Skills :

- Use engineering approach to develop software application.
- Design software application using E-R diagram, DFD, Control diagram.
- Write test cases for given software application.

List of Practical / Assignments / Experiments:

1. Requirement analysis for the given software application
2. Creation of data dictionary for given software application.
3. Draw E-R diagram for the given software system.
4. Convert E-R diagram to database tables.
5. Draw data flow diagram up to level 3 for the given software application.
6. Write Test cases for software application.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	#Roger S. Pressman	Software Engineering, a practitioner's approach	McGraw-Hill Publication, 5 th Edition, 2008
2	Douglas Bell	Software Engineering for students A Programming Approach	Addison Wesley, 4 th Edition, 2005

Text Books

B) Web sites for references:

1. http://en.wikipedia.org/wiki/Software_engineering
2. <http://courses.cs.vt.edu/csonline/SE/Lessons>
3. <http://www.aisindia.net/psp-tsp.asp>
4. <http://www.sei.cmu.edu/tsp/>

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME IN: COMPUTER ENGINEERING

Course : Data Communication

Course Code: R14CP3410

Course Category: Core

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	-	@25	50	175

@ Internal Exam

Rationale:

As data communication is becoming fastest growing technology it has its impact on numerous application areas. To list a few major application areas are Business, Industry, Science, Education etc. It becomes necessary to understand the fundamentals of data communication. Subject data communication help students to understand basic concepts of signals, transmission modes, communication types, different transmission media, interface, switching techniques and the basic network reference model.

Data communication is a theoretical subject and provides a basis for other computer networks subjects.

Objectives:

The student will be able to

- i] Know fundamentals of data communication
- ii] Compare analog and digital communication
- iii] Use various encoding techniques
- iv] Draw related waveforms
- v] Compare OSI and TCP/IP model

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
01	1.1 Introduction to Communication : Importance of communication, communication model: Concepts and Terminology: Analog signal, digital signal, Frequency, amplitude, frequency spectrum, bandwidth, time domain, frequency domain and data rate.	8	12
	1.2 Computer Communications and Networking Models Decentralized Systems, Centralized Systems, Distributed Systems, Client/Server model, Peer to Peer model, web based model		
	1.3 Communication methods and data transmission modes Serial and parallel communications, Synchronous, Asynchronous and Isochronous Communication, applications of each, Simplex, half duplex and full duplex transmission.		

02	Transmission Media 2.1 Introduction, Electromagnetic spectrum, 2.2 Guided Media : Twisted pair :- Physical description, characteristics, Types, connectors. Coaxial cables – physical description, characteristics, connectors Optical fiber – physical description, characteristics, types, connectors Wireless Transmission- Radio waves, Microwaves, infrared, Frequency allocation and propagation 2.3 Transmission Impairments: attenuation, delay distortion and noise T1 and DS circuits	9	16
03	Analog and Digital Communication 3.1 Digital data, Digital signals – Unipolar, Polar – NRZ: NRZ-L, NRZ-I; RZ. Manchester, Differential Manchester, Bipolar – AMI (B8ZS, HDB3) 3.2 Digital data, Analog signals: - ASK, FSK, PSK, QAM Analog data, Digital signals: - Pulse Amplitude Modulation, Pulse Code Modulation, Delta Modulation, Sampling Theorem 3.3 Analog data, Analog Signals: -Amplitude Modulation, Frequency Modulation, Phase Modulation	10	16
04	Multiplexing and Switching 4.1 FDM, TDM, Statistical multiplexing, Wavelength Division multiplexing, Inverse multiplexing 4.2 Circuit Switching, Packet switching, Hybrid Switching.	6	12
05	Networking Standards and References 5.1 Importance of standards, types of standards-Formal, Defacto, Standards making process, standard setting organizations- ISO,ITU,IETF 5.2 The OSI Model, OSI Layer and its functions, 5.3 OSI Service Types, Connection oriented Service, Connection less service, Introduction to TCP/IP, Comparison between TCP/IP and OSI 5.4 Fiber Channel standards, functional levels, applications.	7	12
06	Data Communication Technologies 6.1Broadband- Mobile broadband –wireless internet access, types of Modems, wireless broadband 6.2 FCC,TRAI, Spectrum management, Radio frequency spectrum, frequency bands, licensing 6.3Satellite Communication – Types-GEO,MEO,LEO, examples and applications	8	12

Teaching Methodology: Chalk Board, Discussion, Power Point Presentation

A) Term Work:

Skills to be developed:

i) Life Skills:

- Work as a member of a team /group and as leader
- Develop observation skills

ii) Intellectual Skills:

- Select appropriate tool
- Use of manual, data book

iii) Motor Skills:

- Make proper connection
- Testing of system

List of Practical/Assignments:

1. Generation of PAM signals, waveform observation and measurements.
2. Generation of analog signal and verification of sampling theorem.
3. Generation of PCM signals, waveform observation and measurements.
4. Demodulation of PCM signals, waveform observation and measurements.
5. Generation of ASK signals, waveform observation and measurements.
6. Demodulation of ASK signals, waveform observation and measurements.
7. Generation of FSK signals, waveform observation and measurements.
8. Demodulation of FSK signals, waveform observation and measurements.
9. Generation of PSK signals, waveform observation and measurements.
10. Demodulation of PSK signals, waveform observation and measurements.
11. Binary data generation and observation of NRZ-L, NRZ-I, RZ, Manchester encoding types.

Professional Practices:

1. Observation of sound wave oscillation and note the effect of amplitude and noise with the help of
mice and headphone.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# Behrouz A. Forouzan	Data Communication and networking(2 nd edition)	TMG, 2 nd Ed; 2003
2	A.S. Tanenbaum	Computer Networks	PHI, 4 th Ed; 2002
3	William Stalling	Network Security Essentials	PHI, 3 rd Ed; 2006
4	Achyut Godbole	Data Communications and Networks	TMG, 1 st Ed; 2002

Text Book

B) Web sites for references:

1. www.networktutorials.info
2. <http://csep10.phys.utk.edu/astr162/lect/light/ref-diff.html>
3. www.nptel.iitm.ac.in
4. <http://www.darvill.clara.net/emag/index.htm>
4. <http://fcit.usf.edu/network/>

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Digital Techniques
Course Category: Core

Course code: R14EX3415
Credits: 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	-	-	50	150

Rationale:

In the present era, applications of digital circuits are prevalent in consumer products right from calculators, digital diaries, digital watches, computers, mobile phones, to industrial products. So the Digital Techniques has been introduced as a core technology subject in Computer Engineering curriculum. It will enable the students to assemble, design, test and troubleshoot logical circuits such as Flip-flops, shift registers, Mux, Demux, A/D and D/A converters. It deals with topics ranging from logic gates, to combinational and sequential logic circuits and memories. It lays a foundation for the knowledge of microprocessors and computers.

Objectives:

The students will be able to

1. Understand binary, octal and hexadecimal number systems
2. Understand laws of Boolean algebra
3. Design simple logic circuits.
4. Assemble logic circuits.
5. Test the logic circuits.
6. Observe outputs of logic circuits.
7. Troubleshoot digital circuits.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	1.1 Number Systems : Decimal, Binary, Octal, Hexadecimal number systems, Conversion from one system to another, signed number representation using 1's and 2's complement, Binary addition, subtraction using 1's and 2's complement, BCD & Gray codes 1.2 Logic Gates : AND, OR, NOT, EX-OR, Universal gates – NAND, NOR: symbol, truth table, Boolean expression, building basic gates using universal gates.	9	16

	1.3 Boolean Algebra: Fundamentals of Boolean algebra, basic laws, commutative, associative, distributive laws, duality principle, De-Morgan's theorems		
2	2.1 Combinational Logic Circuits: Introduction to logic design, Sum of products (SOP), Product of sum (POS), Don't care conditions, Karnaugh map representation of logic functions, simplification of logical functions using K-map, (2,3,4 variable), Design example – Half adder, Full adder, Half subtractor 2.2 Encoders and Decoders Multiplexer – concept, 4:1, 8:1, Demultiplexer – concept, 1:4 Digital circuit design using MUX & DEMUX- one example each Decoder – 3:8, Decimal to BCD Encoder, Gray to binary	8	12
3	3.1 Flip-flops Concept of Flip-Flop, Types: S-R, Clocked RS, T, D, J-K, Master slave JK, triggering of Flip-Flops, symbols and truth tables, race around condition, conversion of Flip-flops, asynchronous inputs, uses of Flip-flops	9	12
4	Counters and Registers 4.1 Concept of counters, modulus of counter, ripple, asynchronous, synchronous counters, up/down counters, timing diagrams, decade and binary counter, asynchronous inputs 4.2 Concept of register, shift registers – SISO, SIPO, PISO, PIPO, timing diagrams, ring counter	9	16
5	5.1 ADC And DAC A to D and D to A conversion concepts DAC – weighted register type and R-2R ladder type, specifications ADC – Quantisation & encoding, Types: Successive approximation, Dual slope, Flash method, specifications	7	12
6	Logic Families Introduction to logic families, TTL, ECL, CMOS logic families, characteristics – fan in, fan out, speed, noise immunity, propagation delay, power dissipation, comparison of TTL, ECL, CMOS logic families with reference to above characteristics, tri state logic .	6	12

Teaching Methodology: Chalkboard, Discussion.

A) Term Work:

Skills to be developed:

i) Intellectual Skills:

- Identify
- Selection
- Understanding
- Discrimination
- Interpretation
- Design Approach

ii) Motor Skills:

- Proper connection
- Observe the result and compare
- Testing

List of Practical/ Assignments / Experiments:

1. Verify the truth tables of logic gates
2. Construction of basic gates using universal gates
3. Construction of half adder and full adder
4. Verification of De-Morgan's theorem
5. Multiplexer using IC 74153
6. Demultiplexer/Decoder
7. Binary to grey code converter
8. Verification of truth tables of flip-flops using ICs 7474, 7476
9. Construction of shift register using IC 7495
10. Ring counter and Johnson counter
11. Design of decade counter using IC 7490
12. Design of R-2R ladder DAC

Professional Practices:

1. Getting conversant with Digital ICs
2. Observing / Identifying Pin layout of Digital ICs
3. Connecting Digital ICs and other components on bread board
4. Handle/ use various equipment like Power supply, function generator etc

Learning Resources:**A) Books:**

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	#Malvino and Leach	Digital Principles	TMH, 6 th Ed, 2009
2	#R. P. Jain	Modern Digital Electronics	TMH, 4 th Ed, 2010
3	M. Morris Mano	Digital Logic and Computer Design	Pearson Edu, 4 th Ed, 2008
4	H. Taub, Schilling	Digital Integrated Electronics	McGraw Hill Int,

Text Books

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Web Design

Course Category: Applied

Course code: R14CP4401

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
1	4	–	–	–	50	–	50	100

Rationale:

It is estimated that across the Internet, over 100 million domain names are in use. With fast and cheap broadband Internet connections available to the masses, online users now are exceeding 500 millions. Tens of millions of users are now creating personal Web sites. It is practical oriented subject which will enable student to develop Web sites.

Objectives:

The students will be able to

1. Design simple web pages- using HTML.
2. Organize information using Tables, collect information from users using forms & present information using Frames.
3. Use style sheets to gain full control of formatting within Web page.
4. Embed multimedia to Web pages.
5. Integrate html pages, multimedia elements to develop Web sites.
6. Use Dreamweaver to develop web pages.

Course Details:

UNIT	NAME OF THE TOPIC	Hours
1	<p>1.1 Introduction to web designing: Internet, Client server architecture, basics of Web site, Types of web sites, Web publishing, Web contents, Static and Dynamic web contents, How to host a website.</p> <p>1.2 Introduction to HTML: Components of HTML - Tags, Elements, Attributes, Closed and open tags, Structure tags - <DOCTYPE>, <HTML>, <HEAD>, <TITLE>, meta tags, <BODY> elements Block level tags - Block Formatting, Heading, Paragraph, Comments, line breaks, alignment, divisions, text alignment and font size Text Level Tag - Bold, Italic, moonshape, underlined, strike-through, superscript, subscript, Horizontal Rules – colors in Web page, background color, Text color, Link color, Special characters, Lists - Ordered lists, Unordered lists, Definition list, Nesting lists. The Div tag, The Object tag.</p>	03

2	<p>2.1 Linking Html Documents: URLs, types of URLs, absolute URLs, relative URLs, Linking HTML documents - The Anchor tag, Linking to document in same folder, Linking to document in different folder, Linking to document on the Web, Linking to specific location within document.</p> <p>2.2 Including Images and Sound: Image formats - GIF, JPEG, PNG The HTML img tag, Alignment, Height and Width, HSPACE and VSPACE, Wrapping Text, Image as a link, Image Maps, Embedding sound files-<embed>, </embed>, <bgsound>, </bgsound></p>	02
3	<p>3.1 Tables : Tables - creating Basic tables, tags, table, tr, td, th, Editing of Rows and Columns of table - row span, column span, adding caption. Formatting tables using attributes – display, border, border color, back ground, align, width, no wrap, cell spacing, cell height.</p> <p>3.2 Forms and Frames: Creating Forms, Form controls, Text controls, Password fields, Radio buttons, Check boxes, Reset and submit buttons. The <TEXTAREA>, <SELECT> and <OPTION> TAGS Frames -Introduction to frames, Advantages and disadvantages of using frames, creating Basic Frames, Frame targeting.</p>	03
4	<p>4.1 DHML Style Sheets: Adding style to document, Linking to a style sheet, Embedding style sheet, Using inline style, Style sheet properties, Font properties, Color and background properties, Text properties, Box properties.</p> <p>4.2 Introduction to W3C standards for web sites: What is W3C? What are W3C standards? What are ECMA Standards, HTTP error codes.</p>	02
5	<p>5.1 Photoshop image editing: Bitmap Images, Image Size and resolution, Changing size and resolution, Creating new images, opening and importing images, cropping image, increasing size of canvas , Color modes and models, color channels, Converting images from one mode to another.</p> <p>5.2 Painting with Photoshop: The line tool, painting tools - brush tool, paint bucket, options palette for painting and editing tools, filling and stroking selections, choosing foreground and background colors, using color picker tool, Use of smudge tool.</p>	03
6	<p>Layers and filters: Using Layers palette, Creating layered image, moving and aligning layer contents, managing layered images, editing layers, specifying layer options, using layer effects, selecting opaque areas on layer, using adjusting layers, using layer effects</p> <p>Filters -Previewing and applying filters, using filters for creating special effects, Improving performance with filters, choosing filter effect.</p>	03

Teaching Methodology: Chalkboard, LCD Projector.

A) Term Work :

Skills to be developed:

i) Life Skills :

- Develop observation skills.
- Search information from various sources.

ii) Intellectual Skills :

- Design web pages using HTML tags.
- Design a web site.
- Select appropriate HTML tags for web page design..
- Use software tools to design web pages.

List of Practical / Experiments / Assignments:

1. Create Web page and apply some block level tags, text level tags.
2. Create web pages using paragraph formatting tags.
3. Use ordered list and unordered list in web page.
4. Create Web using hyper links to same page, other page.
5. Use Dreamweaver to include images with different alignments and wrapped text.
6. Create two frames, one frame having URLs to images, when the URL is clicked, load the image in another frame.
7. Create webpage using CSS.
8. Import images in Photoshop and modify their colors, contrast, and tone in selected areas.
9. Merging two or more images using layers.
10. Create special effects on images using filters.

Professional Practices:

1. Create a Web site based on all the above assignments as a mini project. The web site will be based on any subject, theme or idea.

Learning Resources:

A) Books:

Sr.No.	AUTHOR	TITLE	PUBLISHER
1	Thomas a. Powell	HTML & XHTML : The Complete Reference	Tata McGraw Hill, 4 th Edition, 2003
2	D.S. Ray and E. J.Ray	Mastering HTML & XHTML	Sybex Publication, 2002
3	Kris Jamsa, Konrad kind, Andy Anderson	HTML and Web Design Tips and Techniques	Tata McGraw Hill, 1 st Edition, 2002
4	Adobe International	Adobe Photoshop users guide	Adobe Publication
5	Gary David Bouton	Adobe Photoshop Fundamentals	TechMedia Publication

B) Software:

Microsoft Internet Explorer, Mozilla Firefox, Photoshop.

C) Web sites for references:

1. www.w3schools.com
2. www.htmlhelp.com
3. <http://www.webstandards.org/learn/faq/>
4. www.adobe.com

DIPLOMA PROGRAMME IN: COMPUTER ENGINEERING

Course : Visual Basic Programming

Course code: R14CP4402

Course Category: Applied

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
1	4	-	-	-	50	-	50	100

Rationale:

Visual Basic is a structured programming language and a complete application development tool. It is an efficient environment for designing forms and windows. Visual Basic is an Integrated Development Environment, in which the applications can be developed, run, test, and debug. It is used by programmers, who build distributed applications in a team environment. This course helps in understanding the principles and techniques involved in developing applications and graphical user interface. The course content is designed to understand and implement the event driven architecture of Visual Programming.

Objectives:

The students will be able to:-

1. Identify and use different category of controls.
2. Work with forms.
3. Use different data access techniques.
4. Establish a data base connection.
5. Identify the categories of ActiveX controls and create them.
6. Develop Graphical User Interface Applications (GUI).

Course Details:

UNIT	NAME OF THE TOPIC	HOURS
1	Visual Basic Concepts Event driven programming, Terminology : Form, Control, Modules, Projects, Procedures, The Working screen, Controls & Events, Menu system, Writing code, Saving files, file menu, Running & testing Programs, Making exe file, Managing Projects, Steps in creating VB application, Modules : Form, Class, & Standard Modules, Getting & setting focus on an object, Enabling, disabling & controlling visibility at run time, Different types of Events, Creating, Opening & Saving Projects, Adding removing & saving files, Adding & removing custom controls, Autoload file, Control Categories, Object naming conventions.	3

2	Programming Basics Variables & constants, Data-types, Private, public, local & static variables, Scope & lifetime of variables, Symbolic constants, Use of Object property as a variable, Assignments statement, Library functions, arithmetic operators, Hierarchy of arithmetic operators, Writing expressions, Relational operators, Logical Operators, MsgBox Statement, Input Box function, Branching with If, Select case, For next, Do loops, Writing simple visual basic programs involving arrays, Arrays, dimensions, Elements, subscripts, Fixed size & dynamic arrays, Arrays & loops.	2
3	Procedures And Functions Procedures & functions, Creating a function, Recursive functions, Type declaration, Explicit declaration, Creating user defined data types, General procedures, Event procedures & function procedures, Calling Sub procedures, Passing arguments by value & by reference, Using indefinite number of arguments, General declarations, Testing & debugging, Errors & error spotting : Scanning for errors, compile time errors, Debugging tools : breaking & entering break points and watches, Stepping through.	3
4	Using Visual Basic Controls Using standard toolbox control objects : Text control - multiple lines in text box, creating password textbox, Canceling keystrokes in text box, Read only text box, Labels : Sizing labels to fit it's contents, Controls that present choices for the user Use of Check boxes, Option buttons, List box, Combo box, Containers, Buttons, Scroll bars, Working with control arrays, Multiple forms , Start-up forms, Transferring between forms, Menus & menu design, Adding controls to a Form & setting their properties, Using different Library functions in Visual Basic.	3
5	File Handling : Using built in Visual basic File Processing Controls : drive list box control, Directory list box control, File list box control, Common dialog box, Files : sequential & random access files, Open, Close, Input# , Write#, Get#, Put#, statements, EOF functions, Writing simple programs for processing sequential & random access files.	2
6	Using Database & Activex Controls : Accessing & manipulating Databases: relational database terminology, Using Data control, Querying data stored in a Database, Building a database using Visual data manager. Using OLE container control, Design time & run time uses of OLE. Working with Building internet applications with Active X Documents, Basic Internet application Concepts, VB & two tier Client/Server applications, Creating an ActiveX document navigating among ActiveX documents. Adding a form to an ActiveX user document.	3

Teaching Methodology: Chalkboard, Discussion.

A) Term Work:

Skills to be developed:

i) Intellectual Skills:

- Identify
- Understanding
- Interpretation
- Design Approach

List of Practical / Assignments /Experiments:

1. Using Common visual basic controls like Text fields, Labels, Command Buttons.
2. Using Multiple Forms and Standard Modules.
3. Using Arrays (Fixed size & Dynamic arrays).
4. Using User defined data type (Type).
5. String Manipulation using standard library function.
6. Using MsgBox, Input box and using loops.
7. Using Picture box, Imagebox, Drivelistbox, making use of Shape control, Filelistbox, Directorylistbox.
8. Using User defined functions, & Subroutines.
9. Design & use of Menu, Combo Box, List Box, Check Boxes, and Option Buttons.
10. Use of different Events related with mouse & Keyboard, Use of Control Array.
11. Sequential & random access File handling.
12. Creation of database using Visual Data Manager & accessing data using Data Control.
13. Using OLE container control.
14. Using ActiveX controls.

Mini Project on any one of the following topics:

1. Hospital Mgmt.
2. Hotel Mgmt.
3. Payroll System.
4. Admission System.
5. Result System.
6. Reservation System(Railway/Bus/Airlines/Ship)
7. Travel Agency System.
8. Advertising Agency System.
9. Library System.
10. Bank Transaction Handling.
11. Billing System.(Shops, Departmental Stores)
12. Purchase Order & Sales Order System.
13. Front Office Management.
14. Personnel Organizer.
15. Gas Agency System.

Learning Resources:**A) Books:**

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Alan Eliason & Ryan Malarkey	Visual basic : Environment, Programming, & Applications	Prentice Hall India
2	Evangelos Petroustos	Mastering VB 6.0	Publication : BPB
3	Rob Thayer.	Murach's VB 6.0	Techmedia
4	Gary Cornell.	VB 6.0 from the Ground Up.	Tata McGraw-Hill

B) Web sites for references:

1. www.vbcode.com
2. www.vbtutor.net

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Computer Aided Drafting

Course Code: R14ME4402

Course Category: Applied

Credits : 4

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
0	4	-	-	-	@50	-	50	100

@ Internal Exam

Rationale:

This subject intends to teach the students the basic graphics primitives based on AutoCAD. It will also help the students to have hands on experience on graphical representation software. Implementation of this primitives will help the students in using graphics utilities and libraries in their mini project development work.

Objectives:

The students will be able to

1. Understand the importance of Auto CAD.
2. Understand the system commands and their utilities.
3. Draw different drawings using AUTOCAD 2004/ AUTOCAD 2009

Course Details:

UNIT	NAME OF THE TOPIC
1	1.1 Introduction To AUTOCAD 2004/ AUTOCAD 2009 Brief introduction to ACAD, Using pointing device, Opening an existing drawing file, Auto CAD's screen layout, Tool bars, Pull down menus. Dialog boxes, command line and keyboard, status bar
2	2.1 Basic Drawing Commands and Edit Commands : Drawing commands- Line, Point, Arc, Circle, Polyline, Polygon, Trace, Doughnut, Ellipse, Text, Text Styles. Edit commands – Move, Copy, Array, Rotate, Trim, Extend, Mirror, Offset, Stretch, Break, Fillet, Chamfer, Editing single line text, Entering multi-line text, Editing multi-line text.
3	3.1 Drawing Organization and Set up: Organizing drawing with layers, layer state creating new layer, changing object properties. Drawing set up – Controlling unit display, sizing the drawing sheet, creating new drawing with Wizards and Templates, Creating templates.
4	4.1 Efficient Construction Techniques & Drawing Precision Co-ordinate entry methods, View the drawing, Setting snap and Grid; Object snap settings, Getting information about object in drawing.
5	5.1 Hatching Advanced Blocks & Attributes Hatching, Editing the batch pattern creating and using blocks, block properties, Nested blocks, Multiple block insertion, Redefining block, Grouping blocks, Attributes, Inserting Attributes, Editing attributes values, Attribute extraction concept.

6	6.1 Advanced Viewing Technique Zoom & Additional zoom options. Arial view, creating multiple view ports. Visualization Techniques – Concept, Basic rendering option, Adding material to the model, scenes & lighting, Adding special effects, working with Images, All display commands.
7	7.1 Dimensioning Dimensioning concept types of dimensioning ordinate, Dimension. Geometric dimension and Tolerancing, Dimension styles, components of dimension style, Editing dimension text and variables.
8	8.1 Plotting Plotting concept, paper space, creating & working in plotting view port, Layers in view ports, Guide lines for using paper space. Print Command, Selecting plotter, paper size, setting up the parameters & batch plotting.

A) Term Work:

Skills to be developed:

i) Intellectual Skills:

- Identify
- Design Approach
- Understanding
- Selection

ii) Motor Skills:

- Graphical presentation
- Observe the results

List of Practical / Assignments / Experiments:

1. Assignment on pipe symbol & redraw fig. which covers basic draw & modify commands. (2)
2. Assignment on simple component. (like brackets, coupling etc.) which covers osnap & various setting commands. (3)
3. Assignment on various library components (like bolts,nuts,name plate etc.) covering concept of block. (3)
4. Assignment on assembly & details of any one component (like Tail stock, Non Return valve) using layer. (4)
5. Assignment on Isometric Views (in Isometric mode) (2)
6. Assignment on various 3D commands which covers commands in solid & solid editing toolbar. (4)

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Miller	ABC's of Auto CAD	Technical Publication, Singapore
2	George Omura	Instant Auto CAD	BPB Publication, New Delhi
3	D. Raker, H.Rice,	Inside Auto CAD	BPB Publication, New Delhi

B) Web site for Reference:

1. www.autodesk.com
2. www.ptc.com

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE -1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Advanced 'C' Programming

Course code: R14CP4403

Course Category: Applied

Credits : 7

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	4	3	80	20	@25	-	50	175

@ Internal Exam

Rationale:

'C' is the most widely used computer language. 'C' is general purpose structural language that is powerful, efficient and compact, which combines features of high level language and low level language. Due to this inherent flexibility and tolerance it is suitable for different development environments. 'C' can also be used for developing complex algorithms in data structure and system level programming, to develop Operating system.

Objectives:

The student will be able to

1. Use macros in programs.
2. Use compilation directives.
3. Write programs using bitwise operators.
4. Use functions, structures, pointer in program.
5. Understand the use of storage classes of variables.
6. Use enumerated data types.
7. Use data files to store data on secondary storage devices.
8. Use graphics functions to draw graphical shapes.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	1.1 The C Preprocessor : Macros: Introduction to macros, programs to demonstrate use of macro. Macros versus functions, Generic functions. 1.2 Conditional Compilation Directives: #include, #define, #if and #endif, #else and #elif, #undef, #ifdef and #ifndef, #error, #pragma, commenting a part of code. 1.3 Operations on Bits: Logical bitwise operators (&, , ^, ~), shift operators, Masking using Bitwise AND, OR, XOR, Bit fields.	6	12
2	2.1 Storage classes of variables: auto, static, register and extern. Life, scope and initial value of variables for each storage class. 2.2 Functions: Advantages of using functions, Library functions, main() function, User defined functions – function prototype, function definition, function call, function declaration, Concept of local, global and static variables,	10	16

	programs using call by value and call by reference, passing array to function, Passing string to function, recursive function.		
3	3.1 Pointers: Introduction, pointer arithmetic, pointer to pointer, passing parameter to function using pointer(pointer and functions), 3.2 Dynamic memory allocation in ‘C’: What is dynamic memory allocation, its need and advantage, functions for dynamic memory allocation – malloc() , calloc(), realloc() and free(), simple programs based on dynamic memory allocation. 3.3 Pointer to function : Declaring a pointer to a function, calling a function through function pointer, passing a function’s address as an argument to other function, Array of pointers.	8	12
4	4.1 Structure and Union: Declaration, Initialization of structure variables, Accessing members of a structure, Assign values to structure variables, storage allocation and size of structure, array of structures, nested structures, pointer to structures. 4.2 Structure and Functions: Passing structure member, passing a structure variable, passing pointers to structure, returning a structure variable, returning a pointer to structure. Passing array of structures. 4.3 Union: union representation in memory, defining union, difference between structure and union, Union of structure, Use of enumerated data type, renaming data types with typedef.	10	16
5	5.1 Files : Text and Binary streams, Buffer, opening a file, errors in opening files, closing a file, End of file, structure of a file program, standard streams, Character I/O-fputc(), fgetc(), getc(), putc(), String I/O-fputs(), fgets(), formatted I/O-fprintf(), fscanf(), Block Read/Write-fread(), fwrite(), Random access to file-fseek(), ftell(), rewind(). Use of feof(), rename(), remove(), fflush(), closeall() functions. 5.2 Command Line Arguments: Passing Command Line Arguments.	8	12
6	Graphics Programming : 6.1 Text mode graphics : Functions-gotoxy() , textbackground(), textcolor(), window() function , cputs(), cprintf(), textattr(). 6.2 Graphics mode graphics: Graphics mode graphics functions: initgraph(), closegraph(), cleardevice(), getmaxx(), getmaxy(), Drawing different shapes using functions like line(), lineto(), rectangle(), bar(), bar3d(),circle(), arc(), ellipse(), pieslice(), sector() Graphics mode text – outtext(), outtextxy(), settextstyle(),textheight(), textwidth(). Setting color and pattern fills – setcolor(), setbkcolor(), getcolor(), getfillpattern(), setlinestyle(),setfillpattern(),setfillstyle(),floodfill() Drawing polygons – drawpoly(), fillpoly().	6	12

Teaching Methodology: Chalk & Board, Discussion.

A) Term Work:

Skills to be developed:

Life Skills:

- Develop observation skills.
- Develop Computer proficiency.

List of Practical/ Assignments/ Experiments:

1. Program to demonstrate use of Macros.
2. Program to demonstrate use of conditional preprocessor directives.
3. Program using Bitwise operators.
4. Program to demonstrate use of malloc(), calloc().
5. Program using user defined function
6. Program using call by value, call by reference.
7. Program to demonstrate pointer to function.
8. Program using recursive function.
9. Program to demonstrate use of structure, union and nested structure.
10. Program to read and display file contents.
11. Program to store student records in file using block I/O.
12. Program to manipulate contents of file.
13. Program to demonstrate use of graphic functions.

Professional Practices:

1. Guest lecture on applications areas of 'C' programming in IT industry.
2. Create some application using graphics.

Learning Resources:

A) Books:

SER. NO.	AUTHOR	TITLE	PUBLISHER
1	#E. Balagurusamy	Programming in ANSI 'C'	TMH, 4 th edition, 2009
2	S. K. Shrivastava	'C' in Depth	BPB Publication, 3 rd Edition
3	K.R. Venugopal	Mastering C	MC Graw Hill
4	# Yashavant Kanetkar	Graphics under 'C'	BPB Publication, 2008

Text books.

B) Web sites for references:

1. <http://cplus.about.com/od/learningc/ss/pointers2.htm>
2. <http://www.cprogramming.com/tutorial.html>
3. <http://www.programmingsimplified.com/c/graphics.h>
4. <http://guideme.itgo.com/atozofc/>

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE – 1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : P. C. Maintenance

Course Code: R14CP4404

Course Category: Applied

Credits : 6

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
4	2	3	80	20	--	--	50	150

Rationale:

Personal computer, like any other equipment, needs proper maintenance to perform at its best. Knowing the way around PC and conducting routine repairs will keep it in good working order. This subject gives the knowledge and competency to diagnose the faults for troubleshooting for systematic repair and maintenance of computers and computer peripherals.

Objectives:

The students will be able to

1. Identify computer system hardware components.
2. Identify computer system hardware & software faults.
3. Maintain, upgrade & repair computer system.
4. Install all necessary software, configure setup of system.
5. Assembling and de-assembly of computer/laptop.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	1.1 Motherboard and Components: Types of Motherboard, Different motherboard components, Layout of motherboard, Form factor, ATX connector, Back panel connectors, Front panel connectors, Processor socket and slots, IDE, SATA connector, BIOS-basics, main functions, Chipset basic, chipset Architecture, North / South bridge Architecture, Motherboard Selection Criteria, jumper setting (FSB, CMOS, HDD, IDE, SATA), Detail study of RAM (Types: SDRAM, DDR, DDR2, DDR3, Interfacing, Refreshing, Memory Mapping, As per IBM PC), Expanded, Extended Memory, detail study of ROM, different types of Buses (ISA, MCA, EISA, PCI, AGP, AMR, CNR), POST, Setup, system service Routines, BIOS Error messages, Beep code & Troubleshooting with Diagnostic codes (m/b BIOS).	10	12

2	<p>2.1 Monitor: CRT Monitor-Internal structure, Types of Monitor (Monochrome and color), LCD Monitor-Internal Architecture, Types,LCD operation,Advantages,Disadvantages,TFT-Internal Architecture, LED-Internal structure, Plasma Display-In</p> <p>Monitor Specification and characteristics, Pixel and Resolution, Dot Pitch Horizontal scanning, Vertical scanning, Raster, and retrace Interlacing, bandwidth</p> <p>2.2 Display adapter: Detail block diagram & description of MDA & CGA, comparative Study of different types of display adapter, EGA, VGA, SVGA.Troubleshooting & diagnosing the problem related with monitor & video adapter.</p>	12	16
3	<p>3.1 Keyboard & serial devices: Detail study of keyboard, (working, Construction, Interfacing Key codes, Key bouncing), Types of Key switches (Membrane, capacitive, Bar types), working (their uses), Keyboard Maintenance and troubleshooting</p> <p>Mouse : Uses of mouse, specification, types of mouse (Optical, opto-Mechanical) Maintenance and troubleshooting of Mouse</p> <p>Wireless keyboard and mouse working.</p>	10	12
4	<p>4.1 Disk drive: Recording methods (FM, MFM,RLL) Hard disk drive: Detail study of hard disk construction, types of hard disk, Hard disk drive & interfaces (ATA, IDE, EIDE, SCSI, SAS drive) Installation of Hard disk drive, ATAPI (ATA Packet Interface)Hard disk drive related terms (Disk head, sectors, track, cylinders, Zoned recording, seek time, access time) Drive formatting (low level & High level) file systems, (FAT, FAT16, FAT32, NTFS), Drive capacity limits, operating system limit, HDD maintenance & Troubleshooting, Solid state HD,Blue-ray disk, RAID technology, features of USB 3.0</p> <p>4.2 Viruses : Types of viruses, functioning, Symptoms, Removing viruses using Antivirus software, protecting the PC, Troubleshooting anti-virus tools.</p>	12	16
5	<p>5.1 Printers: Types of printer (Impact, Non-impact), Working of dot matrix printer, troubleshooting & maintenance. Working of inkjet printer & maintenance, Troubleshooting, Working of laser printer, troubleshooting & maintenance. Network Printer network configuration, Print server – installation, configuration.</p>	10	12
6	<p>6.1 Laptop Basics : Motherboard, CD/DVD drive, Hard disk, Power supply, LCD Monitor, Card reader, Bluetooth, Wireless adapter, charger, Ports – HDMI, SATA, Specifications</p> <p>6.2 Laptop Upgrades , Maintenance and Troubleshooting : Upgrade of memory, CPU, Hard disk, Graphics card Laptop Maintenance and repair – Cleaning, driver installation, Troubleshooting - Power problems, Battery problems, Laptop monitor problems, CD/DVD problems, Overheating, Hard drives, USB.</p>	10	12

	6.3 SMPS: principle of operation, Block diagram and working, advantages and disadvantages. 6.4 UPS: principle of operation, Block diagram and working, types, calculation of capacity of UPS.		
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Teaching Methodology – Chalkboard, Discussion, Power Point Presentation, video.

A) Term Work:

Skills to be developed:

i) Intellectual Skills:

- Identify the different hardware components of computer system.
- Identify the computer system hardware and software faults.
- Understand the print mechanism of printer.
- Selection of proper peripheral components for connection.

ii) Motor Skills:

- Proper connection of components /devices.
- Assembly/Disassembly of printer/HDD/CD-ROM
- Testing of printer, motherboard, SMPS.
- Installation of software for configuration.

List of Practical / Assignments / Experiments:

- 1) To observe the components of motherboard and understand their purposes.
- 2) Jumper setting (FSB, CMOS hard disk (master/slave)
- 3) CMOS settings.
- 4) Back panel and Front panel of CPU.
- 5) Post and booting with Beep indicator and error codes..
- 6) Disassembly and assembly of HDD.
- 7) Disassembly and assembly of CD ROM.
- 8) Preventive maintenance and troubleshooting of monitor and display adapter.
- 9) Cleaning and maintenance of Keyboard and mouse.
- 10) Installation of Print server to access printer through network
- 11) Operating system and device driver's installation on Laptop.
- 12) Installation of Anti-virus software – configuration, updates, firewall settings.

List of Professional Practices:

- 1) Assembling and de-assembly of computer/laptop.
- 2) Guest lecture on assembling and de-assembly of Printer.
- 3) Guest lecture on general preventive maintenance and troubleshooting of monitors.
- 4) To submit a report of about 5-10 pages on Manufacturers and cost of Computer, Printers.
- 5) To submit a report of about 5-10 pages on advanced computer peripherals: specifications, use, and cost.
- 6) Buying of new computer/laptop (cost, make, model etc.).
- 7) Find computer specifications and required peripheral devices depending on the application areas
(E.g. home use, office use, DTP, bank, IT industry, railway reservation etc.)

- 8) Find information about recent development in monitor technology (e.g.LCD, LED, TFT etc.)
- 9) Find information about refilling of printer cartridges.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# M.Radhakrishnan, D. Balasubramanian	Computer Installation And Troubleshooting	Tata MC-Graw Hill, 2005
2	# Govindrajalu	IBM PC and CLONES	Tata MC-Graw Hill, 2 nd Edition, 2002
3	# Corey Sandler	Laptop All in one Desk Reference for Dummies	Wiley Publishing, 2008
4	Stephen J. Bigelow	Troubleshooting Maintaining and Repairing PCs	Tata MC-Graw Hill, 5 th Edition, 2001
5	Mark Minasi	PC Maintenance and Upgradation	BPB Publications, 2005
6	Mike Meyers	CompTIA A ⁺ Guide PC Technician	Tata MC-Graw Hill, 2007 Edition
7	Craig Zacker John Rourke	The Complete Reference : PC Hardware	Tata MC-Graw Hill, 2008
8	Morris Rosenthal	The Laptop Repair Workbook: An introduction to Troubleshooting and Repairing	Foner Books, 2008

Text book

B) Web sites for references:

1. http://www.helpwithpcs.com/maintenance/pc_maintenance.htm
2. <http://www.howstuffworks.com>
3. <http://www.pctechguide.com/tutorials>

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME IN: COMPUTER ENGINEERING

Course : Linux Operating System

Course code: R14CP4405

Course Category: Applied

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	-	25	50	175

Rationale:

Operating System is the interface between the user and the computer system. Nowadays LINUX is one of the most widely used operating system. Knowledge of UNIX/LINUX operating system is essential as it provides many features such as multitasking, multiuser, security etc. which are mainly used in both server and workstation systems.

Contents of this course familiarize students with the basics of UNIX/LINUX, writing Shell scripts as well as administering the network.

Objectives:

The student will be able to

- i] Know basic concept of LINUX operating system.
- ii] Use commands for various applications.
- iii] Use vi editor for creating/editing commands.
- iv] Write Simple Shell Scripts.
- v] Administer the network.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
01	Introduction	8	12
	1.1 Brief History & General Introduction, Features, Architecture, OS Services, run levels.		
	1.2 File System- Hierarchical File System, File System Features, Data Structures.		
	1.3 Processes - Process Concept, Context of Process, Context switch, Process States, State Transition Diagram, and Data Structures for Processes. Logging into the System.		
	1.4 Editor: vi, e-mac		
02	LINUX Commands I	7	12
	2.2 Locating Commands, Internal & External Commands, Arguments, Options & Filenames, Online help		
	2.3 General Purpose Utilities cal, date, who, tty, uname, passwd, echo, tput, bc, script		
	2.3 Navigating the File System Concepts- Files, Directories, Paths, Home Directory, Parent- Child Relationships. Commands- pwd, cd, mkdir, rmdir, ls		

03	LINUX Commands II 3.1 Handling Ordinary Files: cat, cp,rm,mv,file, wc, cmp,comm,diff 3.2 File Attributes File Permissions, listing file permissions, chmod Command. 3.3 grep Family: Regular expressions, grep, egrep, fgrep, tr Command.	7	12
04	The Shell 4.1 Concept of Shell, sh Command, Pattern Matching-the Wild Cards, Escaping-the Backslash(), Quoting, Redirection, Pipes, Tees, Command Substitution, Shell Variables 4.2 Shell Programming Shell Scripts, read Statement, Command Line Arguments- Positional Parameters, Exit Status of Command, Logical Operators && and , exit Statement, if and case Statements, expr Statement, while, until and for Statements, Sample Validation & Data Entry Scripts, Scripts Using Simple Commands, sed command	12	16
05	AWK 5.1 Introduction to Filtering Simple Filtering using AWK, Splitting Lines into Fields, printf Statement, variables and expressions, Logical & Relational Operators, Number Processing, Variables, -f Option in AWK, BEGIN & END Sections, Built in variables and functions, Arrays, Control Flow Statements-if, for, while.	6	12
06	LINUX Administration 6.1 System Administration: root- Administrator's Login, su- Acquiring superuser Status, Administrator's Privileges- passwd Commands. Maintaining Security. 6.2 User management – useradd, groupadd, Operations: Startup and shutdown, IP address configuration, NIS,NFS,SAMBA introduction 6.3 Managing Disk Space – df, du, find command-Locating files dd, Command-Copying Disks and tapes, disk management-RAID. Telnet, Backups: Introduction, Need. cpio & tar commands	8	16

Teaching Methodology: Chalk Board, Discussion, PPT

A) Term Work:

Skills to be developed:

i) Intellectual Skills:

- Understand various concepts related to OS
- Select proper command
- Develop shell programs
- Install the Unix/Linux OS
- Observer the result.

List of Practical/Assignments:

1. Use of LINUX commands
2. Use of LINUX commands
3. IP address configuration
4. Use of vi editor.
5. Use of pipes and redirection
6. Use of grep, fgrep, egrep, tr commands.
7. Simple Shell programming using control statements like for, while, if, case. (5 to 7 small programs).
8. Exercises on AWK programming.
9. Use of file access permissions
10. Use of system administration commands like su, usradd, chgrp, chmod, passwd.
11. Use of Backup commands.

Professional Practices:

1. Installation of Linux.

Learning Resources:**A) Books:**

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# Maurice Bach.	The Design of Unix Operating System	PHI,2001
2	# Sumitabha Das.	Concepts and Applications - Unix	Tata Mc-Graw Hill
3	S.M.Sarwar,Robert Koretsky	Unix-The Text Book	Pearson Education,2 nd Ed,2007
4	Yashawant Kanitkar	Unix Shell Programming	BPB Publication

#. Text Books

Web sites for reference:

1. <http://www.linux.org>
2. <http://www.linux.com>
3. <http://www.unix.com>
4. <http://www.redhat.com>

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE -1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Project and Seminar

Course code: R14CP4406

Course Category: Applied

Credits : 04

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
-	4	-	-	-	-	50	100	150

Rationale:

In the field of Computer and Information Technology various technologies(hardware and Software) needs to be integrated and proper paradigms needs to be implemented to develop any kind of computer Applications. Hence it becomes essential to get hands on experience for developing industrial applications. This subject is essential to understand the implementation of the system development process i.e. analyze, design, coding, debugging and testing. This will help the students to acquire skills and attitudes to work as programmer or Network administrator.

Furthermore, the student will be able to find out various sources of technical information and develop self-study techniques to prepare a project and write a project report.

Objectives:

The students will be able to

1. Work in Groups, Plan the work, and Coordinate the work.
2. Search for requirements and information.
3. Develop leadership qualities.
4. Develop Innovative ideas.
5. Practically implement the acquired knowledge.
6. Develop basic technical Skills by hands on experience.
7. Develop technical documentations and presentation skills
8. Develop skills to use latest technology in Computer/Information Technology field.
9. Analyse the different types of Case studies.
10. Develop entrepreneurial qualities.

Course Details:

Instructions for the selection of topic for Project:

- 1) Project can be from any of the subject from followings:
 - a. Software development in latest application software.
 - b. RDBMS and system development.

- c.Multimedia and graphics applications.
- d.Software / Hardware related to networking.
- e.Internet or web based application.
- f. Microprocessor/ Microcontroller based system development.
- g.Add on cards for Microcomputer.
- h.Transducers interfacing with Computer.

- 2) The subject for the project should be approved by project guide / HOD / Sponsoring agency.
- 3) Group of maximum **four** is allowed.
- 4) Each member of the project group should maintain the diary of weekly working duly signed by the project guide with his suggestions, remarks & the steps taken to be finally submitted *along with the project and project reports*.
- 5) The students and guides are expected to search for the sponsorship for funding & technical support from industry and Experts.
- 6) The students should plan his project completion, exhibitions & presentations with audio visual aid & Power Point presentation.
- 7) One copy should be submitted to the Department.
- 8) Students should submit the project reports as per following format:
 - a. Background of the subject & Criteria for selecting project topic.
 - b. Requirements analysis.
 - c. Up-to- date development of the subject/recent trends.
 - d. Defining the scope of the project.
 - e. Problem formulation.
 - f. System/ program formulations.
 - g. Data flow diagram and E-R diagram (if data base is used).
 - h. Control diagram.
 - i. Programs.
 - j. Sample outputs for each program.
 - k. Specific uses of these programs.
 - l. Note or specific contribution, if any.
 - m. Appendices of chart, tables etc.
 - n. Clips, programs, sample outputs, for exhibitions and presentations.
 - o. References.
 - p. Acknowledgements if any.
 - q. Project source code with entire set of accessories such as database, drivers, audio and video files etc. be submitted to the Department on a CD.
- 9) Students should present seminar on the project in group.

Besides these points proportionate weightages will be given to the following points while evaluating the work:

1. Creativity, Innovative ideas, imaginations, and formulations.
2. Analysis and synthesis of Information.
3. Future projections, marketing potentials, and cost effectiveness.
4. Entrepreneurship culture.
5. Documentations and Presentation.
6. Modular designs.
7. Knowledge of latest developments in the field and recent trends.

Skills to be developed:

i) Intellectual Skills:

- Identify various tool/utilities required for project.
- Selection of various tool/utilities required for project.
- Interpretation of results.
- Understanding the requirements.
- Reading installation/User manuals.
- Designing Approach.
- Report Writing.

ii) Motor Skills:

- Making Proper connections.
- Measurement of quantities/parameters.
- Testing and troubleshooting various modules.
- Draw graphs.
- Observe the result and compare.
- Collect data/information.
- Work as a team member.

DIPLOMA PROGRAMME: COMPUTER ENGINEERING**Course : Java Programming****Course code: R14CP5401****Course Category: Specialized****Credits : 7**

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	4	3	80	20	25	-	50	175

Rationale:

Java emerged as the better choice of programming language due to its simplicity, portability and security. It is purely Object Oriented Language. It is used in all applications from simple home applications development control system to complex space control systems. This course focuses on all the basics of java including classes, objects, methods, interfaces, inheritance, packages, exceptions, threads, applet and selected core libraries such as String, Math. Course also provides the basic foundation for developing simple applications and forms the base for Advanced Java.

Objectives:

The students will be able to

1. Define class, object and methods.
2. Create packages and interfaces and use it in programs.
3. Create multithreaded programs.
4. Manage errors and exception.
5. Design applet and graphics programs.
6. Design web based Java Applications.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	1.1 Overview Of Java Language : Brief History, Features of Java language – platform independence, Byte code, Java virtual Machine, Security and portability, garbage collection, Applications of Java, Java Environment – Java Development Kit and Features of JDK 1.5, 1.6, and 1.7, Introduction to Java API's. 1.2 Java Language Fundamentals : Java Program structure, Character set, Constants, Variables, Data types, Operators – arithmetic, relational, logical, conditional, Expressions, Control statements – if, if-else, if-else-if ladder, switch-case, Loop statements – for, while, do-while, while, using arrays in	8	12

	Java, Command line arguments.		
2	2.1 Classes Class fundamentals, creating objects, constructors, Naming conventions in Java, static members, accepting input from user, array of objects, use of the this keyword, method overloading. 2.2 Wrapper Classes : Use of Wrapper classes – Integer, Float, Double, Boolean, Character, Long, conversion of primitive data types to objects and vice-versa. 2.3 String Class : Use of String class, methods of string class for manipulation of strings, String Buffer Class and methods of String Buffer Class, Vectors and methods of vector , conversion of string to primitive data types and vice-versa.	10	16
3	3.1 Inheritance : Basics of Inheritance, types of inheritance, Member access and inheritance, using this and super for member and constructor references, multilevel inheritance, use of final, abstract class, method overriding. 3.2 Multiple Inheritance Using Interface : Use of interface, defining an interface, implementing interface, applying interface.	6	12
4	4.1 Exception Handling : Fundamentals, Types of built in exceptions, Handling exception, try-catch-finally, throws statement, handling user defined exceptions. 4.2 Packages : Use of package, built in packages, naming conventions, creating package, using a package, adding a class to a package, hiding classes	6	12
5	5.1 Multithreading : Basic concepts, Use of threads, creating and running threads, Implementing Runnable, extending Thread, Thread life cycle, methods of Thread class, creating multiple threads, synchronization of methods and objects. 5.2 Streams And File I/O : Concept of streams, stream classes, input stream classes, output stream classes, methods of input stream and output stream classes, use of FILE class, creating a file, opening a file, closing a file, reading bytes from a file, storing bytes to a file, random access files, storing and retrieving primitive data to files, Object serialization.	10	16
6	6.1 Applets : Java applets, difference between applet and application, creation of applet, applet life cycle, running applet through applet viewer and web browser, HTML APPLET tag, passing parameters to Applet, getDocumentBase() , getCodeBase() , showDocument(). 6.2 Graphics In Applets : Drawing graphical shapes on applet – rectangle, circle, arc, line, rounded rectangle, ellipse, Methods of applet class, Setting font & Changing style and size of fonts foreground & background color. 6.3 Collection Framework : Benefits of collection framework, Collection interface, List Interface, Set Interface, Traversing Collections, Iterator, Collection interface array operator.	8	12

Teaching Methodology: Chalkboard, Discussion, and Power Point Presentation.

A) Term Work:

Skills to be developed:

i) Life Skills :

- Develop observation skills.
- Search information from various sources.
- Work as a member of team.

ii) Intellectual Skills :

- Prepare algorithm for developing programs.
- Debugging of programs.
- Use programming language constructs for program implementation.
- Write programs.
- Select appropriate programming language constructs.
- Debugging of programs.

List of Practical / Assignments / Experiments:

Note: Use an IDE for Java Programming such as Text Pad / Net beans / Eclipse.

1. Programs using objects, control statements and loops.
2. Use of command line arguments.
3. Program to accept input from user.
4. Program to illustrate use of wrapper classes.
5. Program using Collection interface.
6. Program using String class and its methods.
7. Program to illustrate inheritance.
8. Program to handle built in exceptions.
9. Program to throw and handle user defined exceptions.
10. Creation and use of user defined package.
11. Multithreading using Thread class / Runnable Interface.
12. Menu driven program to manipulate files.
13. Storing objects in a file using object serialization.
14. Simple applet to display messages and graphical shapes.
15. Changing font and background/foreground color of applet.

Professional Practices:

1. Create a mini project in Java for any real life application.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# E. Balagurusamy	Java Programming	Tata McGraw Hill, 4 th Edition, 2009
2	# Herbert Schildt	Java Complete Reference – Java 2	Tata McGraw Hill, 7 th Edition, 2006
3	Joseph L Weber	Using Java 2	PHI (Eastern Economy Edition), 2002

#: Text Books

B) Web sites for references:

1. <http://www.freejavaguide.com>
2. <http://www.sun.com>
3. <http://java.sun.com/docs/books/tutorial/>
4. <http://www.freejavaguide.com/>
5. <http://www.leepoint.net/notes-java/index.html>

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE – 1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Multimedia Techniques

Course Code: R14CP5402

Course Category: Specialized

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	-	@25	50	175

@- Internal Examination

Rationale:

Multimedia utilizes a combination of different content forms. In general, multimedia includes a combination of text, audio, still images, animation, video, and interactivity content forms. Multimedia finds its application in various areas including, but not limited to, advertisements, art, education, entertainment, engineering, medicine, mathematics, business, scientific research and spatial temporal applications. This course makes students aware of the basic concepts of multimedia and use of some multimedia development software and hardware tools.

Objectives:

The students will be able to

1. Understand basic concepts of multimedia.
2. Record, edit and use sound files, video clips.
3. Use various Multimedia peripheral devices to produce multimedia building blocks.
4. Understand various file formats & compression techniques.
5. Understand the Operating system support required for multimedia.
6. Develop Multimedia application by integrating basic multimedia building blocks.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	1.1 Introduction: What is Multimedia, Classification of media, Multimedia applications, Multimedia building blocks, Multimedia and internet, required skills, multimedia team, Steps in development of multimedia project, issues to be considered for multimedia presentation, Outlining, storyboard templates, Multimedia PC workstation components. 1.2 Memory and Storage Devices: Mass storage systems for multimedia, requirements, DVD, Blue ray disk. Pen drive, Flash Memory, Types of memory card. 1.3 Text: Types of text, Unicode standard, Font, Text compression, Text file formats.	08	16
2	2.1 Digital Audio Representation: Use of audio in multimedia, digital representation of sound, MIDI format & MIDI devices, production tips, audio recording, using sound in multimedia, Audio file formats: wav, mp3. 2.2 Video Technology:	08	12

	Using video, analog versus digital, color fundamentals, obtaining video clips, How video works, broadcast video standards - NTSC, PAL, SECAM, HDTV, Digital TV. 2.3 Shooting and Editing Video: Video tips, shooting platforms, lighting, chroma key or blue screen composition, recording formats, component (YUV), component digital, composite digital.		
3	3.1 Multimedia Operating Systems: Operating system features for multimedia, issues involved like real time design, resource management, process management, device drivers. 3.2 Compression: introduction, Lossy and lossless compression, Hybrid compression. Lossless compression techniques- Huffman encoding, Lempel-Ziv-welsh (LZW), Run-Length Encoding (RLE) encoding. Image compression (JPEG encoding), Audio compression, video compression (MPEG), MPEG standards overview. File formats : bmp, gif, jpeg, mpeg	10	16
4	4.1 Multimedia Databases: Multimedia database management system – Need, features, design issues. Data search and retrieval requirements and techniques, Interactive content based image retrieval, content based indexing. 4.2 Online Multimedia: Audio and video streaming, applications, Windows multimedia streaming objects and hierarchy, Streaming bandwidth and storage, Streaming protocols – RTP, RTSP, SDP.	6	12
5	Multimedia Networks: Requirements and performance issues Distributed Multimedia Applications, peer-to-peer and multipeer communications, Network performance parameters for multimedia- (Throughput, Error rate, Delay, Round-trip delay, Delay variation or Jitter.) Characteristics of multimedia traffic sources. Factors that affect network performance, Multimedia traffic requirements for networks, Quality of service.	8	12
6	6.1 Basic Software Tools: Text editing, Word processing tool, OCR software, painting and drawing tools, 3-d modeling and animation tools, image-editing tools, sound editing tools, animation, 6.2 QuickTime Player: Services offered by quick time, quick time embedded commands for HTML, types of files are supported by Quick Time, embedding the movie in a web page. 6.3 Multimedia Authoring Tools: Types of authoring tools- card- and page-based authoring tools, icon-based authoring tools, time-based authoring tools, Features of Authoring Tools- editing features, organizing features, programming features, interactivity features, performance tuning features, playback features, delivery features, cross-platform features, internet playability	08	12

Teaching Methodology – Discussion, Power Point Presentation, Demonstration using Multimedia Projector.

A) Term Work:

Skills to be developed:

i) Intellectual Skills:

- Use software tools for image/audio/video/animation creation/editing.
- Select appropriate software tools for given application .
- Design multimedia application storyboard.
- Develop multimedia building blocks

ii) Motor Skills:

- Proper connection, installation of peripheral devices.
- Proper handling of peripheral devices.
- Settings on control panel of peripherals.

List of Practical / Assignments / Experiments:

1. Use of scanner for scanning text, graphics, document scanning.
2. Use of tablets for freehand drawing.
3. Photography using digital camera and web camera/digital camera.
4. Video recording using web camera.
5. Use of joystick/trackball.
6. Audio recording using mike and sound forge.
7. Editing of audio and adding effects using sound forge.
8. Taking Video clips and Video editing using video editing software.
9. Working with images using Photoshop.
10. Use of multimedia authoring tool – Director.
11. Conversion of graphics files from one format to another using compression techniques.
12. Compression of video and audio using software tools.
13. Creation of a multimedia application using all the multimedia building blocks.

Professional Practices:

1. Create an interactive multimedia CD for any subject.
2. Find information about popular digital camera manufactures, types, and specifications.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# Tay Vaughan	Multimedia Making it Work	Tata MC-Graw Hill, 7 th Edition, 2006
2	# John F. Koegel, Buford	Multimedia systems	Pearson Education Asia, 2008
3	Judith Jefcoate	Multimedia in Practice Technology and applications	Prentice Hall India, 2008
4	Nigel Chapman, Jenny Chapman	Digital Multimedia	Wiley India Edition, 2009

#: Text Books

B) Web sites for references:

1. <http://en.wikipedia.org/wiki/Multimedia>
2. <http://raidlab.cs.purdue.edu/papers/editor.pdf>
3. [http://csnotes.upm.edu.my/kelasmaya/web.nsf/.../Chap2 \(Software2\).pdf](http://csnotes.upm.edu.my/kelasmaya/web.nsf/.../Chap2%20(Software2).pdf)
4. [http://en.wikipedia.org/wiki/Streaming media](http://en.wikipedia.org/wiki/Streaming_media)

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE - 1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Web Programming

Course code: R14CP5403

Course Category: Specialized

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
1	4	-	-	-	-	50	50	100

Rationale:

Web programming together with the World Wide Web grew during the last few years. At this stage almost entire computer technology is web programming dominated. The course provides the students with basic knowledge and skills for developing dynamic and active web pages and complex sites.

It introduces ASP.NET for use in web application development. This course presents all the essential tools, libraries, components and best practices that today's Web developers must utilize, while building leading-edge ASP.NET Web applications.

Objectives:

The Students will be able to

- Understand the fundamentals of web based applications.
- Understand the difference in Visual Studio 2008 with web sites and web application projects.
- Know all the different controls and how to create custom controls.
- Know how to use the navigation controls, including breadcrumbs.
- Understand ASP.NET's provider model.
- Use ADO.NET with the latest ASP.NET Data controls.
- Use AJAX to dramatically improve web performance and user experience.

Course Details:

UNIT	NAME OF THE TOPIC	Hours
1	1.1 Introduction and installation of ASP.NET : Understand the basic architecture of a Web application Understanding the role of HTTP, The difference between HTML and XHTML Key features of ASP.NET 3.5, Asp.NET and the .NET Framework, Common Language Runtime, .Net Framework Class Library, Understanding Namespaces, The Structure of ASP.NET Page, Directives, Code Declaration Blocks, Code Render Block, C# fundamentals. 1.2 Setting up and Installing ASP.NET: Installing Internet Information Server, IIS Manager, Creating virtual/home directory,	06

	Folder Settings, Adding a virtual directory to your neighborhood, Installing Visual Studio.Net 2008.	
2	<p>2.1 The Page Class and Other Files: The architecture of ASP.NET Web page, Work with members of the Page class, The Page class events, Explore the single-file and code-behind models The ASP.NET directives (Page, Control,etc), The Request and Response objects, The IsPostBack property, Understand the basics of web.config, The global.asax file.</p> <p>2.2 ASP.NET Controls: Understand the ASP.NET Web control event architecture, The categories of Web Controls, Displaying information, Label Controls, Literal Controls, Textbox controls, RadioButton And RadioButtonList Controls, CheckBox And CheckBoxList Controls, Submitting Form Data, Button controls, LinkButton Control, ImageButton Control, Displaying Images, Image Control,Using Panel Control,Using Hyperlink Control, Programming with Web control events, Examine the use of HTML tables and CSS Positioning for Web content.</p>	06
3	<p>3.1 Using the Validation Controls: RequiredFieldValidator Control, RegularExpressionValidator Control CompareFieldValidator Control, RangeValidator Control ValidationSummary Control, CustomValidator Control Disabling Validation, Creating a LengthValidator Control.</p> <p>3.2 User Controls and Master Pages: Understanding and creating user controls, Creating composite user controls, Manipulating user controls on the host page, Exposing events from user controls, Host Web pages subscribing the user control events, Introducing Master pages, A Master page walkthrough, Nested Master pages, Master page events and page access.</p>	06
4	<p>4.1 Site Navigation: Basic page navigation, Response.Redirect() and Server.Transfer(), Work with the MultiView control, Work with the Wizard control, Understand the site map model of ASP.NET,Examine the Menu navigation control, Examine the TreeView navigation control.</p> <p>4.2 ADO.NET: Introducing System.Data namespace, The ADO.NET Data Providers , The Speedy DataReader, Binding DataReaders to Web controls ,Working with Parameters, Working with SQL Server Stored Procedures , The Disconnected Model, Working with the Data Adapter , Working with the members of a DataSet, Working with a DataView ,Testing the CommandBuilder , Adding Data relationships.</p>	05
5	<p>5.1 Data Binding: Understanding ASP.NET Data Binding, Data Binding with Array, Collection and Custom Types, Look at some new ways to manage Connection Strings in our applications, Declarative data binding, Expression data binding, Data Source Controls, The SqlDataSource control, The GridView control, The Repeater control.</p> <p>5.2 Using the Login Control: Overview of Login Controls, Using Login Controls, Automatically Redirecting a user to the Referring Page, Automatically Hiding the Login</p>	04

	Control from Authenticated Users, Authenticated Users, Using a Template with Login Control, Performing Custom Authentication with Login Control, Using LoginStatus Control, Using LoginName Control, Using ChangePassword Control.	
6	6.1 Overview of XML: Overview of XML, Web Services, XML Web Services Facilitate Communication XML Web Services Enable Aggregation, Creating an simple XML Web Services Setting WebMethod Attribute, Setting WebServices Attribute, Precompiling an XML Web Service, Testing an XML Web Services from browser, Invoking an XML Web Service with HTTP-Get, Invoking an XML Web Service with HTTP-Post Invoking an XML Web Services with SOAP. 6.2 AJAX(Asynchronous JavaScript and XML): About Ajax, Server Side Ajax, Client Side Ajax, Ajax Toolkit, Setting up and implementing Ajax. 6.3 Deployment: Copy, XCopy and RoboCopy a Web Site, Pre-compiling a Web site using , aspnet_compiler.exe, Copying a Web site in Visual Studio, Publishing a Web site in Visual Studio, Building an ASP.NET Web deployment (*.msi) project.	05

Teaching Methodology: Discussion, Power Point Presentation, Demonstration using Multimedia Projector.

A) Term Work:

Skills to be developed:

i) Life Skills :

- Develop observation skills.
- Search information from various sources .
- Work as a member of team.

ii) Intellectual Skills :

- Prepare algorithm for developing programs
- Use programming language constructs for program implementation.
- Write programs .
- Select appropriate programming language constructs.
- Debugging of programs.

List of Practical /Assignments / Experiments:

1. Install Visual Studio .NET 2008.
2. Install IIS on your machine and create the C:\WAP virtual directory.
3. Create a user interface on an ASP.NET page by using standard Web server controls.
4. Use user input validation in ASP.NET.
5. Create a user control and a custom server control and add them to an ASP.NET page.
6. Access and manipulate data from different sources by using ADO.NET 3.5.
7. Access and manipulate data from Windows Communication Foundation services or Web services.
8. Present data to the user by placing data-bound controls on an ASP.NET page.

9. Improve page responsiveness by using the ASP.NET AJAX controls.
10. Use Login Controls.
11. Create a web based application to accept and store students information.
12. Create a web based application to use data grid to accept and display information.
13. Create a web application using web services and XML.
14. Create a web application using database stored procedures.
15. Deploy an ASP.NET application to a production Web server.

Professional Practices:

1. Create a web based mini project for any real life, online application.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	George Shepherd	#ASP.NET 3.5 Step by Step	Prentice Hall India Publications, 2008
2	Anne Boehm, Joel Murach	Murach's ASP.Net web programming with C# 2008	Shroff Publishers and Distributors, Delhi (SPD), 2008
3	B.M.Hirwani	Practical ASP.Net 3.5 projects for beginners.	Shroff Publishers and Distributors, Delhi (SPD), 2009

: TextBooks

B) Web sites for references:

1. <http://www.microsoft.com/NET>
2. <http://www.webreference.com/programming/asp/>
3. http://www.en.wikipedia.org/wiki/Internet_Information_Services
4. <http://www.asp101.com/links/>

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE – 1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Animation Techniques

Course code: R14CP5405

Course Category: Specialized

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
1	4	-	-	-	-	50	50	100

Rationale:

Computer animation is one of the most rapidly expanding areas of creative endeavor and technical development. Computer-generated sequences in feature films and television, digital special effects in feature films, computer-animated simulator rides, computer games and virtual environments are some of the more visible applications of 3D computer animation.

The Animation Techniques course prepares students for activities involving the design, development, and testing of modeling, rendering, and animation solutions to a broad variety of problems found in entertainment, sciences, and engineering. An exploration of computer based animation and drawing techniques utilizing a vector-based animation program such as Macromedia Flash.

Objectives:

The Students will be able to

- Create their own storyboards to communicate concepts for animation.
- Utilize key framing and tweening to efficiently animate characters.
- Create two-dimensional animation sequences.
- Express an idea or thought through the creation of visual forms.
- Create simple three dimensional animations.
- Incorporate audio into completed animations.

Course Details:

UNIT	NAME OF THE TOPIC	Hours
1	1.1 Basic Concepts : What is animation? Traditional method – cell animation, frame rates, storyboard, Model animation - key framing, The role of computers, Manipulation by computers, Kinematics / Dynamics, Applications of Computer Animation. 1.2 Basics of Computer Graphics : Pixels, Co-ordinates, Raster/Vector, Transformations, Modeling, Hidden surfaces, Rendering, Textures, Artifacts, Hardware. 1.3 Two dimensional animation using Flash : Introduction to IDE : Exploring Flash interface – Application bar, stage and work area, tools panel, library panel, properties panel, library panel, timeline, motion editor panel Creating new workspace, setting the stage, saving flash file, opening an existing file.	05
2	2.1 Drawing tools : Pen tool, Text tool, Line tool, Rectangle tool, Pencil tool,	05

	<p>Brush tool, Deco tool, Bone tool, Paint Bucket tool, Eyedropper tool, Eraser tool.</p> <p>2.2 Using Colors : Creating gradients, Using opacity of gradients, Creating custom colors, Adding filters.</p> <p>2.3 Using objects and text: Selection tool, Lasso tool, Moving, Copying, Deleting an object, Editing objects – reshaping, optimizing curves, softening edges, group and ungroup, transforming objects, Working with text – static text field, dynamic text field, Input text field, scrolling the text, breaking apart the text.</p>	
3	<p>3.1 Working with Time line panel: Inserting frames on the timeline, blank key frames, key frames, copying, pasting, selecting, deleting frames, changing length of frame sequence.</p> <p>3.2 Working with layers and layer folders : Creating a layer, Locking and unlocking layers, Hiding a layer, Creating a layer folder, Renaming a layer or layer folder, Copying and pasting layer content, deleting a layer.</p> <p>3.3 Using symbols, instances and library : Exploring types of symbols, Creating symbols, Modifying symbols – Editing in place, edit in new window, Working with instances, inserting instances, Using the common libraries in Flash, Creating graphics symbol, Creating movie clip symbol, Creating a Button symbol, Creating your own library.</p>	05
4	<p>4.1 Working with Sound and Video : Importing a sound file, Adding sound to the timeline, Adding sound to a Button, Editing sound, Working with video- importing and editing a video file.</p> <p>4.2 Creating Animation : Creating Frame by frame animation, creating a shape tween, Creating motion tweens, changing the motion path by moving a tweened object, changing location of a motion path, deleting a motion path of a tween, Creating a classic tween, Creating classic tween motion along a path, Shape tweening, Shape hints, Creating Mask layer, Using nested tweens.</p>	05
5	<p>5.1 Advanced animation in Flash : Understanding Bones – Adding Bones to Symbols and Shapes, Animating an Armature in the timeline and in runtime, creating an armature into a movie clip or graphic symbol, working with 3D animation -Using 3D Rotation tool, Using 3D translation tool.</p> <p>5.2 Working with Action Script : Action Script versions, features of action script, ACTIONS Panel Overview-Script Pane, Panel Menu, Actions Toolbox, Script navigator, Adding Action Script to frames, buttons, Using Action Script with a movie clip, creating animated masks with movie clips, dragging movie clips.</p>	07
6	<p>Publishing and Exporting Flash files : Understanding publishing, Publish settings, Publish profiles-creating a publish profile, Duplicating a publish profile, Renaming a publish profile, Exporting and importing a publish profile, Deleting a publish profile. Exporting files in flash-Exploring the various export file formats, Exploring files from flash projects.</p>	05

Teaching Methodology: Discussion, Power Point Presentation, Demonstration using Multimedia Projector.

A) Term Work:

Skills to be developed:

i) Life Skills :

- Search information from various sources .
- Innovation.

Intellectual Skills :

- Prepare storyboard for developing animation.
- Use software tools to design animation.
- Select appropriate tools for animation design.

List of Practical /Assignments / Experiments:

1. Create a simple flash document and set its properties, and use basic drawing tools.
2. Create a frame by frame animation using blank key frames.
3. Create a motion tweened animation using path, layer.
4. Create an animation using shape tweening.
5. Use tweening inside tweening to create animation.
6. Create animation graphics, movie symbol.
7. Working with sound in the animation.
8. Working with video in the animation
9. Create an interactive animation using Buttons and Navigation Action Script.
10. Create a simple animation using Action Script control statements.

Professional Practices:

1. Create a report on application areas of animation in Film and Television industry.
2. Create a Mini project such as an advertisement or educational animation using 2D and 3D animation.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	#Kogent Solutions Inc.	Flash CS5 in Simple Steps	Dreamtech Press, 2012 Edition.
2	#Stuart Mealing	The art and science of Computer Animation	Cromwell Press, Wiltshire.

#: Text Books

B) Web sites for references:

1. www.css.tayloru.edu/instrmat/graphics/hypgraph/animation/motion_capture/history1.htm
2. <http://www.iua.upf.es/~jordi>
3. http://www.art.uiuc.edu/local/anle/ANIMATION/animation_intro.html
4. [http:// www.flashanimationsite.com/](http://www.flashanimationsite.com/)
5. [http:// www.flashanimation.com/](http://www.flashanimation.com/)

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE -1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : OS for Mobile Devices

Course Code: R14CP5406

Course Category: Specialized

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
1	4	-	-	-	-	50	50	100

Rationale:

Android is an open source Operating System for mobile devices such as Smartphone and tablet computers. This course will provide a basic understanding of Android development, including the use of content providers and implementing location and maps. Students will learn about the various stages of development on the Android platform, designing User Interface, application services, permissions and security.

Objectives:

The students will be able to

7. Understand the fundamental concepts of Android development.
8. Understand the android application framework.
9. Understand activity lifecycle.
10. Build a simple user interface and handle user input.
11. Create, store and retrieve data from SQLite database.
12. Develop small and simple application.
13. Debugging an application.

Course Details:

UNIT	NAME OF THE TOPIC	Hours
1	1.1 Introduction Introduction to android, android: an open platform for mobile development, native android applications, and the development framework- what comes in the Box, understanding the android software stack, the dalvik virtual machine, and android application architecture. 1.2 Downloading and installing the android sdk and updates to the sdk, developing with eclipse, using developer tools plug-in for eclipse.	2
2	2.1 Building applications Creation of first android application, (creating project, android virtual device, launch configuration, running and debugging of application using Util Log, understanding the hello world program). 2.2 Types of android applications, developing for android, the dalvik monitor	2

	<p>service, the android debug bridge, the hierarchy viewer and lint tool.</p> <p>2.3 Expanding the user interface</p> <p>Introducing the action bar, creating and using menus and action bar action items, introducing dialogs, toast, introducing notifications.</p>	
3	<p>3.1 Creating applications and activities</p> <p>What makes an android application? Introducing the application manifest file, using the manifest editor, externalizing resources, the android application lifecycle, understanding an application's priority and its process states, introducing the android application class, a close look at android activities.</p> <p>3.2 Building user interfaces:</p> <p>Fundamental android UI design, android user interface fundamentals, introducing layouts, to-do list example, introducing fragments, the android widget toolbox, creating new views, introducing adapters, support for multiple resolutions.</p>	3
4	<p>4.1 Intents and broadcast receivers</p> <p>Introducing intents: using intents to launch activities, introducing linkify, using intents to broadcast events, introducing the local broadcast manager, introducing pending intents. Creating intent filters and broadcast receivers- using intent filters to service implicit intents, using intent filters for plug-in and extensibility, listening for native broadcast intents, monitoring device state changes using broadcast intents, managing manifest receivers at run time.</p> <p>4.2 Using internet resources</p> <p>Downloading and parsing internet resources, using the download manager, using internet services, connecting to google app engine (google play service or google map service).</p>	3
5	<p>5.1 Files, saving state and preferences</p> <p>Saving simple application data, creating and saving shared preferences, retrieving shared preferences, introducing the preference framework and the preference activity, persisting the application instance state, including static files as resources, working with file system.</p> <p>5.2 Databases and content providers</p> <p>Introducing android databases, introducing SQLite, content values and cursors, working with SQLite databases, creating content providers, using content providers, adding search to the application, native android content providers.</p>	3
6	<p>6.1 Working in the background</p> <p>Introducing the services: creating and controlling services, binding services to activities, creating foreground services. Using background threads: using AsyncTask to run asynchronous tasks, using intent services, introducing loaders, manual thread creation and GUI Thread synchronization. Using</p>	3

	alarms: creating, setting and canceling alarms, setting repeating alarms, using repeating alarms to schedule network preferences, JSON parser using Gson library. 6.2 How to publish your android application: How to create the developer account, how to package your application with zip align, signed build.	
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Teaching Methodology – Chalkboard, Discussion, Power Point Presentation.

A) Term Work:

Skills to be developed:

i. Intellectual Skills :

- Developing small programs.
- Debugging of programs.
- Use programming language constructs for program implementation.

List of Practical / Assignments / Experiments:

Note: Use an IDE for android Programming such as Eclipse.

- 1) Create a hello world program in android.
- 2) Create a simple application using different layouts, themes and android default styles.
- 3) Create an application to demonstrate Activity lifecycle.
- 4) Create an application to demonstrate Intent, Intent Filters, Broadcast receivers.
- 5) Create a sample application using shared preferences.
- 6) Create a Multi-pane development application in Android with Fragments
- 7) Create a sample application using SQLite and content providers.
- 8) Create a sample application which makes use of wifi, Bluetooth or camera services.
- 9) Create a application to make use of web services (Students can do XML or Jason parsing in this)
- 10) Create a sample application to demonstrate the use of Google MAPs v2.

Professional Practices:

3. Installation of eclipse and android sdk.
4. Development of Mini application in android.

Learning Resources:**A) Books:**

SR. NO.	AUTHOR	TITLE	PUBLISHER
1.	Reto Meier	# Professional Android Application Development.	Wiley India Pvt. Ltd. (8 June 2012)
2.	Wei-Meng Lee	Beginning Android 4 Application Development.	Wiley India Pvt. Ltd. (11 May 2012)
3.	Barry Burd	Android Application Development All-in-One For Dummies.	John Wiley & Sons; Pap/Psc edition (23 December 2011)
4.	<u>Joseph Annuzzi Jr., Lauren Darcey, Shane Conder</u>	Introduction to Android Application Development: Android Essentials (Developer's Library)	Addison Wesley; 4 edition (26 November 2013)

Text books

B) Web sites for references:

1. <http://www.vogella.com/tutorials/android.html>
2. www.tutorialspoint.com/android/
3. <https://developer.android.com/training/basics/firstapp/index.html?hl=it>
4. <http://www.learn-android.com/category/beginner/>
5. <http://www.beginandroid.com/>
6. <http://www.talkandroid.com/guides/beginner/>
7. www.learn-android.com/

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME IN: COMPUTER ENGINEERING

Course : Network Administration

Course Code: R14CP5407

Course Category: Specialized

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
1	4	-	-	-	-	50	50	100

Rationale:

Computer Network subject covers the foundation part of networks, when actual implementation has to be done then sharing and security plays an important role which should be supported by practical knowledge.

The course content of this subject introduces with installation and configuration of Windows 2012 Server operating system. It covers administration part such as creation of users, groups, sites, setting permissions to file and folder sharing resources, DNS, DHCP, security policies, disk quota etc. The subject moves away beyond basic theory to the practical in administering the network.

Objectives:

The student will be able to

- i] Install Windows Server 2012
- ii] Configure networking resources
- iii] Monitor network performance
- iv] Troubleshoot network faults
- v] Manage disk quota
- vi] Implement backup and recovery strategy

Course Details:

UNIT	NAME OF THE TOPIC	HOURS
01	The Windows Server 2012 Environment 1.1 The Windows Server 2012 family and key features, Hardware requirements, Installation of Windows Server 2012 1.2 Architecture of windows server 2012, Installing and configuring various peripheral devices and add on card drivers 1.3 Configuring Device Driver Signing Options, Installing, configuring administrative tools 1.4 Implementing User, Group, and Computer Accounts Creating User Accounts, Creating Computer Accounts, Modifying User and Computer Account Properties 1.5 Managing Groups Creating groups, Managing group membership, Strategies for using groups, Using default groups	2

02	Managing Access to Resources 2.4 File systems – FAT, FAT32, NTFS, Features of NTFS, Creating and Sharing Folders, Configuring NTFS Permissions, Publishing Shared Folders, Testing Permissions Managing the User Environment - Group Policy 2.5 Configuring Group Policy Settings, Assigning Scripts with Group Policy, Restricting Group Membership and Access to Software 2.6 Planning group policy strategy, creating Group Policy Objects GPOs	3
03	Administrative Templates and Audit Policy 3.1 Using Account policy – password policy, logon policy, disk quota policy, 3.2 Overview of Security in Windows Server 2012, Using Security templates to Secure Computers, Testing Computer Security Policy Managing Disks 3.3 Preparing Disks, Managing Disk Properties, Mounted Drives, converting Disks, Creating Volumes, Initialize and partition a disk	3
04	Windows Server 2012 Networking 4.1 Defining a network infrastructure, basic terms – workgroup, domain, multiple domains, trust relationship 4.2 Active directory, remote access, name resolution, TCP/IP network infrastructure – network protocols 4.3 IP address – the hierarchical addressing scheme, classification of IP address, Subnetting a network, subnetting concepts – information hiding, subnetting TCP/IP networks, calculating number of subnets IP Routing 4.4 Understanding IP routing, How routing works, Route tables, Types of routing – Static, Dynamic	3
05	Active directory 5.1 The active directory’s logical structure, Benefits of active directory, Components and mechanisms in active directory –datastore, Schema, Global catalog, replication Domain Name System 5.2 Understanding DNS, Domain naming, DNS and the internet, DNS and Windows Server 2012, Dynamic DNS, DNS Terminology Working of DNS, Installation and configuration of DNS server, Creating DNS zones – forward lookup and reverse lookup zone	3
06	Dynamic Host Configuration Protocol 6.1 Overview of DHCP, the DHCP lease process, Understanding scope details, advantages and disadvantages of DHCP 6.2 Installing DHCP, authorizing DHCP for active directory, creating and managing DHCP scopes, managing reservations and exclusions Backup and Recovery Strategy 6.3 Planning backup and recovery strategy, using windows backup, RAID Scheduling backup jobs, Backing up system state data, Using volume shadow copy, automated system recovery	2

Teaching Methodology : Chalk Board, Discussion, Guest lectures, Industrial visits.

A) Term Work:

Skills to be developed

i. Life Skills :

- Search information from various sources
- Work as a member of a team /group and as leader
- Collect field data
- Write report for given task/work/project

ii) Intellectual Skills:

- Select suitable equipment for networking
- Interpret various commands

II. Motor Skills:

- Make proper connection for networking
- Installation of software
- Handle computer system

List of Practical/Assignments:

1. Installation of Windows Server 2012
2. Creation of local users and group and implementation of its properties.
3. Configuration of TCP/IP network
 - i) Assign IP Address
 - ii) Verify IP Communication
4. Configuration of Router
5. Installation of Virtual Operating System through VMware
6. Implementation of local, roaming, hardware profile
7. Installation and verification of Active Directory
 - i) Domain Controller.
 - ii) NetBIOS Domain Name.
 - iii) Permissions.
 - iv) Verifying the Installation.
 - Event Viewer
 - Event Log
8. Installation of Domain Name System.
 - i) DNS Namespace
 - ii) DNS Zones
9. Active Directory users and components implementation.
 - i) Creating a user/Computer.
 - ii) Properties.
 - iii) Testing from Client.
 - iv) Joining a Domain.
10. Creation and management of OU structure.
11. Applying Group policies to OU.
12. Applying security to Active Directory objects using Group Policy Object Editor.
13. Installation and implementation of DHCP.
 - i) Authorizing DHCP for Active Directory.
 - ii) Creating and managing DHCP Scopes.

14. Management of Disk and Disk Quota entries.
 - i) Preparing Disk
 - ii) Creating Volumes
15. Implementation of Telnet.
16. Installation and implementation of Remote Desktop.
17. Implementation of Backup and Recovery Strategy.

Professional Practices:

1. Implementation and gathering information of Network Monitoring result.
2. Mini project in group.

B) Field Work:

1. Guided Industrial visit.
(Guidelines may change with respect to Industry type.)

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# Orin Thomas	Administering Windows Server 2012	Microsoft Press
2	Mark Minasi, Kevin Greene, Christian Booth, Robert Butler, John McCabe, Robert Panek, Michael Rice, Stefan Roth	Mastering Windows Server 2012 R2	Wiley / Sybex
3	Mitch Tulloch	Installing and Configuring Windows Server 2012	Microsoft Press

Text Book

B) Web sites for references:

1. www.practicallynetworked.com/
2. www.networktutorials.info/
3. www.microsoft.com
4. www.visualwin.com/

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME IN: COMPUTER ENGINEERING

Course : PHP Programming

Course Code: R14CP5408

Course Category: Specialized

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
1	4	-	-	-	-	50	50	100

Rationale:

PHP is the recursive acronym for Hypertext Preprocessor. It is a powerful tool for web developers. It is widely-used, free, and open source. This course will teach how to build dynamic and interactive websites using the PHP programming language. It includes flow control, variables, expressions, and storage and retrieval of data using SQLite database.

Objectives:

The Students will be able to

1. Setup a PHP server environment.
2. Generate dynamic web pages using PHP programs.
3. Use PHP functions ..
4. Use SQLite to store and retrieve data in text files.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS
1	1.1 Introduction: What is PHP?, Advantages of PHP : Performance, Scalability, Database Integration, Built in libraries, Cost, Object oriented support, 1.2 Installing PHP : Installation on Windows/Linux, Installing Apache web server for Windows/Linux, Configure apache server for PHP, Configure PHP, Test PHP,XAMPP server (X-cross platform, A-apache, M-MySQL, P-PHP, P-PERL).	4
2	2.1 PHP Basics: How PHP works?, Structure of PHP script, Using PHP variables : Naming variables, Creating and assigning values to variables, variable variables, Display variable values: echo tag, print_r tag, Using PHP constants 2.1 PHP data types: Integer, Floating point, String, Boolean, Array, Object, Resource, NULL	6
3	3.1 Working with Arrays: Traversing array: manually, using for-each-next, Multidimensional arrays 3.2 Using Date and Time: Setting local time, Formatting Date, Storing time-stamp in a variable. 3.3 PHP error messages: Parse error, Fatal error, Warning, Notice, Strict, Logging error message.	6

4	3.1 Adding Comments: Single line, Multiline comments .. 4.2 Using Conditional statements : if statement, Nested if statement, Switch statement, Comparing values, Checking variable content: isset(), empty(), is_array(), is_float(), is_null(), isnumeric(), is_string() 4.3 Pattern matching : Using regular expression, Using PHP functions: preg_match(), Joining multiple comparisons	6
5	5.1 Using Loops : for loop, while loop, do-while loop, nested loops, Avoid infinite loops, breaking out of a loop, 5.2 Using Functions : Creating a function, passing values to a function, Passing values by reference, Returning a value from a function, Using built in functions: String functions- chr(), strlen(), strpos(), strcmp() .	6
6	6.1 Using Operating System Commands : use of backticks, system function, exec function, passthru function. 6.2 Using SQLite : Connect to database, execute SQL queries, retrieved data, Close the connection	4

Teaching Methodology: Discussion, Power Point Presentation and demonstration using Multimedia Projector.

Term work:

Skills to be developed:

i) Life Skills:

- Develop observation skills e.g. observe output of PHP instructions.
- Search information from various sources, such as Internet, Books etc
- Innovation: Use innovative ideas to create a web page in PHP

ii) Intellectual Skills:

- Use PHP to create web pages.
- Create SQLite database,
- Access SQLite database through PHP pages.

List of Practical / Assignments / Experiments:

1. Create a web page using PHP to display your information such as name, address.
2. Create a PHP page to display current date and time.
3. Use conditional statements in PHP.
4. Use loop statements in PHP.
5. Write PHP code to traverse array and display its contents
6. Use pattern matching commands in PHP.
7. Use exec, passthru and backtick commands in PHP.
8. Use built in functions for checking variable content in PHP.
9. Write a function to display your name and address.
10. Use SQLite database with PHP to store and retrieve data.

Professional Practices :

1. Download and install apache tomcat server.
2. Download and Install PHP.

Learning Resources:**A) Books:**

SRNO.	AUTHOR	TITLE	PUBLISHER
1	Lerderf,Tatroe & Macintyre	Programming PHP (2 nd	O'Reilly
2	David Sklar & Adam Trachtenberg	PHP Cookbook!" (2 nd Edition)	O'Reilly
3	Ivan Bayross & Sharanam Shah	PHP 5.1 for beginners	Shroff Publishers & Distributors Pvt.

B) Web sites for reference:

1.<http://phptutorial.codepoint.netl>

2.<http://www.w3schools.com/PHP/>

3. <http://www.tuxradar.com/practicalphp>

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Advanced Computer Networks

Course Code: R14CP5409

Course Category: Specialized

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	-	25	50	175

Rationale:

Development in data communication and computer networks brought changes for telecommunication, business, satellite communication, science, education and many more.

The subject course content helps student to gain knowledge regarding new technologies. Prerequisite for subject is Computer Networks. Subject covers advancements in networks such as WWW, ISDN, WLAN, WWAN, VOIP, Cellular Telephony and related protocols.

Objectives:

The student will be able to

- Know working of WWW
- Set-up WLAN
- Describe GPS,GPRS,GSM,CDMA
- Know VOIP technology
- Know cellular technology

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
01	World Wide Web and HTTP 1.1 Architecture of WWW: Client, Server, URL, Cookies, Web Documents static, dynamic, active documents & examples. 1.2 HTTP – overview, HTTP transaction – Request and response messages, Persistent and Non persistent connection, Proxy server, Internet Connectivity process, Electronic mail – Architecture User Agent: Services, E-Mail Address, Mailing List Message formats –RFC, RFC 822: Headers; MIME: MIME Headers Message Transfer Agent – SMTP Mail Access Agent: POP3, IMAP Web based mail	8	16
02	Telephone Networks 2.1 Telephone Services: Analog Service, Digital Service Analog Service: Analog Switched service, Analog Leased service, Analog Hierarchy 2.2 Digital Service – Switched 56, DDS, DS.	8	12

	<p>Concept of T Lines - T1 Frame, Fractional T Lines Digital Subscriber Line – ADSL – Modulation Technique DMT, HDSL, SDSL, VDSL</p> <p>Integrated Services Digital Network 2.3 Services – Bearer, Teleservices, Supplementary Evolution of ISDN – Subscriber loop channel – B, D, H User Interfaces – Basic Rate Interface, Primary Rate Interface</p>		
03	<p>Wireless LANs 3.1 Introduction, Architecture of WLAN—Basic Service Set (BSS), Ad hoc Network, Infrastructure Network, Extended Service Set (ESS) 3.2 WLAN Layers – Physical Layer, Data Link Layer – Hidden Station Problem, Exposed Station Problem, DCF, PCF, NAV, Interframe Spacing, Fragmentation</p> <p>Bluetooth 3.3 Architecture – Piconet, Scatternet –Parked Mode, Standby Devices. Bluetooth Layers – Radio – Band, Baseband – Time Slot, SCO Link, ACL Link, L2CAP – data packet format, Multiplexing, segmentation and reassembly, group Management. QOS.</p>	8	12
04	<p>Frame Relay 4.1 Introduction, advantages over X.25, Frame Relay Devices, Virtual Circuit and concept of DLCI, Congestion Control mechanism using FECN and BECN, Frame Relay frame format 4.2 Frame Relay Network Implementation, Features – Extended address, FRAD, VOFR, LMI Advantages and Disadvantages of Frame Relay</p> <p>SONET 4.3 Introduction, SDH Signals, SONET System – SONET devices, SONET layers –Physical – Photonic Layer, Data Link Layer – Path, Line Section Device layer relationship, SONET frame format, Applications</p> <p>Asynchronous Transfer Mode 4.4 Introduction, Design Goals, Cell Concept, ATM Architecture: UNI, NNI, Virtual Connection – Transmission Path, Virtual Path, Virtual Connection Identifiers – VPI, VCI Applications of ATM</p>	10	16
05	<p>Multimedia communication 5.1 Audio Video Services, Digitization, Compression, Streaming Concept Streaming Stored Audio/Video – Using web server, Using web server with Metafile, Using a media server, Using a media server and RTSP, digital video recorder, CCTV 5.2 Real Time Interactive Audio/Video—Characteristics—Time Relationship, Jitter, Timestamp, Playback Buffer, Ordering, Translation, Mixing, Distribution Methods—Unicasting, Multicasting, Broadcasting, Multiple Unicasting Real time transport protocol – Protocol Suit, Packet Format, port assignment Real time control protocol – Message Types, port assignment</p>	8	12

	Voice over IP 5.3 Ways of using VOIP Service. VOIP working, Features and advantages of VOIP Protocols – SIP, H.323 SIP – Messages, addresses, formats, simple session, tracking callee 5.4 H.323 – Architectural model for Internet Telephony, functions of Gateways and gatekeeper, protocol suit – RTCP, H.225, Q.931, H.245 5.5 Introduction to MPLS, VOMPLS, GMPLS		
06	Wireless WAN 6.1 Cellular telephony – Circuit Switched System – Analog, Digital Cell, frequency-reuse principle, transmission, reception, handover, Roaming, cell splitting, sectoring, microcell zone 6.2 First generation – AMPS, Second generation – DAMPS, GSM, Third generation – CDMA, GPRS, IMT -2000 radio interfaces, Fourth Generation, 3GPP, LTE 6.3 Satellite networks – applications, orbits, Three categories of satellite – GEO, LEO – Iridium, Globalstar, Teledesic, MEO satellites – GPS, trilateration, synchronization 6.4 Introduction to Wi-MAX, mobile OS and security	6	12

Teaching Methodology: Chalk Board, discussion, ppt

A) Term Work:

Skills to be developed:

i. Life Skills :

- Search information from various sources
- Collect field data
- Write report for given task/work/project

i) Intellectual Skills:

- Select suitable equipment for networking
- Interpret various commands

ii) Motor Skills:

- Make proper connection for networking
- Installation of software

List of Practical/Assignments:

1. Web server Configuration.
2. Proxy server Configuration.
3. Implementation of Wireless LAN on network simulator
4. Setup of WLAN network with Access point and transfer of information..
5. Implementation of Wi-MAX on network simulator.

6. Implementation of Wireless WAN on network simulator.
7. Design and implementation of cellular network on network simulator.
8. Study of different protocols using network simulator.
9. Monitor the performance of network link utilization and throughput on network simulator

Professional Practices:

1. Get information about installation, functioning of BTS, BSC, MSC, HLR, VLR etc. from a telecom company.
2. Visit the nearest telecom service provider company, and get familiar with the process of internet connectivity, broadband access.
3. Case Study of the Internet Telephony, Video Conferencing using VoIP. (Also study the IP Phones e.g. Yahoo messenger, Google Talk, Skype).

B) Field Work:

Guided Industrial visit. (Guidelines may change with respect to Industry type)

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
01	# Behrouz A. Forouzan	Data communication and networking(2 nd edition) Data communication and networking(4 th edition)	TMG,2 nd Ed;2003 TMG,4 th Ed;2008
02	# Andrew S. Tanenbaum	Computer Networks	PHI,4 th Ed;2002
03	Jochen Schiller	Mobile Communications	PE,2 nd Ed;2003
04	William Stallings	Data and Computer communications	PHI,8 th Ed;2006
05	Jerry D. Gibson	Multimedia Communications	Harcourt India, Imported Edition;2006

Text Book

B) Software:

Estinet 8.0 Network Simulator and Emulator

C) Web sites for references:

1. <http://www.grc.nasa.gov/WWW/k-12/John/nasasci.htm>
2. www.nptel.iitm.ac.in
3. <http://www.networktutorials.info/>
4. <http://compnetworking.about.com/>

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Microcontroller
Course Category: Specialized

Course code: R14CP5410
Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	--	25	50	175

Rationale:

The subject includes the detail study of the microcontroller 8051. It is essential for the students to know the programming of microcontroller. It prepares the base for course on Embedded Technology.

Objectives:

Students will be able to

1. Understand fundamentals of Microcontrollers.
2. Differentiate between Microprocessors and Microcontrollers.
3. Write simple programs for 8051.
4. Handle small applications.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	Introduction to Microcontrollers: Introduction, Microprocessors and Microcontrollers, comparing Microprocessors and Microcontrollers, choosing Microcontroller, overview of 8051 family.	8	12
2	The 8051 Architecture : 8051 block diagram, 8051 oscillator and clock, program counter and pointer, A and B CPU registers, flags and program status word(PSW), internal memory, the stack the stack pointer, special function registers, counters and timers	9	16
3	Interrupts and Serial communication: 8051 Interrupts: interrupts and polling, ISR, steps in executing an interrupt, interrupts in 8051, priority of interrupts. Basics of Serial communication, asynchronous serial communication, 8051 support for serial communication	9	12
4	Assembly Language Programming: Introduction, Addressing modes, Data types and directives, Data moving instructions: data moves, external data moves, code memory read only data moves, push and pop, data exchange, simple example programs; arithmetic instructions: instructions affecting flags, increment, decrement, addition, subtraction, multiplication and division, example programs	10	16

5	Logical, Jump and Call Instructions: Byte level and bit level logical operations, rotate and swap operations, example programs Jump and call program range, jumps, calls, example programs	6	12
6	Applications: Interfacing of keyboard, display, ADC, Temperature controller and water level controller (block diagram level)	6	12

A) Practical:

Skills to be developed:

i) Intellectual Skills:

- Identify
- Interpretation
- Selection
- Understanding

List of Practical: (any Eight /Twelve):

1. Program which includes data transfer operations.
2. Program which includes arithmetic operations.
3. Program which includes use of conditional operations (4).
4. Program which includes arithmetic operations (2).
5. Program which includes byte operations.
6. Interfacing of keyboard with 8051.
7. Interfacing of display with 8051.
8. Interfacing of ADC with 8051.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Kenneth J. Ayala	The 8051 Microcontroller- Architecture, Programming & Applications	2 nd Ed, Penram Internatinal
2	M. A. Mazidi, J. G. Mazidi	The 8051 Microcontroller and Embedded Systems	10 th Indian Reprint, 2004, Pearson Education

B) Web sites for references:

1. www.microcontroller.com/
2. www.cs.ucr.edu/
3. www.rigelcorp.com/pi8051.htm
4. en.wikipedia.org/wiki/8051

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Computer Security

Course Code: R14CP5411

Course Category: Specialized

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	-	25	50	175

Rationale:

Networks are expanding and are running myriad applications. This growth and expansion of networks increasing reliance of businesses on them, has given rise to new challenges of securing these networks. As the security environment worsens due to a complex set of threats and vulnerabilities, network security must be dealt with at different levels. The application environment too is changing fast with thousands of new applications based on hundreds of new protocols coming up. However securing a network and thereby guaranteeing its high performance, availability is important. The subject course content help students to gain knowledge regarding the network threats, techniques available and the law made for different cyber crimes. Prerequisite for subject is Computer Networks.

Objectives:

The student will be able to

- vi) Know the need of network security implication.
- vii) Recognize common types of attacks and protect against them.
- viii) Analyze essential elements of security policies.
- ix) Know the cyber law.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
01	Introduction to the Concepts of Security: 1.1 Threats to security, need for security, Security approaches- No security, Security through obscurity, Host security, Network Security, Phishing attacks. 1.2 Security policy, Principles of security, Types of attack- Denial of service, backdoors and trapdoors, sniffing, spoofing, man in the middle, replay, TCP/IP Hijacking, encryption attacks, Virus types .	6	12

02	Cryptography : 2.1 Symmetric Encryption and Message Confidentiality Symmetric Encryption Principles-Model of symmetric Encryption, Cryptography, Cryptanalysis, Types of attacks on Encrypted Messages. 2.2 Cipher –Types of Cipher, Message Authentication- Message Authentication Code (MAC). 2.3 Transposition Techniques- Rotor machines: Enigma, Purple, Steganography.	10	16
03	Symmetric and Asymmetric Infrastructure, Algorithms 3.1 DES, Asymmetric Encryption, AES 3.2 Digital Signature, RSA, Knapsack 3.3 Digital Certificates, Certificate authorities, Registration Authorities 3.4 Key Distribution and Management	8	12
04	System Security 4.1 Intruders, Intrusion detection system(IDS),host based IDS, Network based IDS, Honeypot 4.2 Password Management, vulnerability of password, password selection strategies 4.3 Operating System Security – General steps for securing Windows, Linux based system	8	12
05	Network Security 5.1 IP Security – Overview, architecture, IPSec Configurations, IPSec Security 5.2 Virtual Private Network, types of VPN 5.3 Email Security – Email Architecture, Email security, Enhancements- PGP,S/MIME, Cyber security	8	12
06	Web Security 6.1 Web security threats, web traffic security approaches 6.2 Transport Layer Security, Secure Socket Layer, Secure Electronic Transactions 6.3 Wireless Application Protocol Security(WAP),Security in GSM 6.4 Internet Crimes, Cyber Laws, Ethical Hacking approaches	8	16

Teaching Methodology: Chalk Board, Discussion, Power Point Presentation.

A) Term Work:

Skills to be developed:

i. Life Skills :

- Search information from various sources
- Write report for given task/work/project

i) Intellectual Skills:

- Prepare algorithm for developing programs
- Use of programming language constructs for program implementation
- Interpret various commands

ii. Motor Skills:

- Make proper connection for networking
- Installation of software
- Testing of software and system

List of Practical/Assignments:

1. Securing a system through registry settings
2. Securing a system through password policy settings
3. Implement Virtual Private Network through VMware
4. Write a program to find an IP address of a remote system
5. Case study of Security Monitoring tools.
6. Case study of Intrusion detection system (IDS)

Professional Practices:

1. Install a Proxy server and configure an application Gateway.
2. Configuration of firewall.
3. Configuration of Router.
4. Configuration of web-server.
5. Configuration of mail-server.
6. Implementation of DES.
7. Implementation of packet sniffing in LAN.

Guest Lectures on following Topics:

- Web Security.
- Forensic Analysis of Windows Registry.

B) Field Work:

Guided Industrial visit. (Guidelines may change with respect to Industry type).

Learning Resources:

B) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	#Atul Kahate	Cryptography and Network Security	TMG, 2 nd Ed; 2004
2	#William Stallings	Cryptography and Network Security Principles and Practices	PE, 5 th Ed; 2010
3	Wm.Arthur Conkin, Dwayne Williams, Gregory B. White Roger L.Davis, Chuck Cotheren	Principles of Computer Security Security+ and Beyond	TMG, 2 nd Ed; 2004
4	COMPAIA A + Guide –PC Technician	Mike Meyers	TMH, 2007

Text Book

D) Web sites for references:

1. <http://www.interhack.net/pubs/network-security>
2. <http://www.encryptionanddecryption.com>
3. <http://www.pgpi.org/doc/pgpintro>
4. <http://www.networktutorials.info>

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE - 1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Advanced Java

Course Code: R14CP5412

Course Category: Specialized

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	--	25	50	175

Rationale:

This course uses the Java language to develop skills in the design and development of object oriented systems involving significant numbers of objects. Emphasis is placed on the more advanced features of the Java language. This course extends the basic Java language skills to cover more complex object oriented applications. Students gain experience in object oriented design involving multiple classes, and develop multi level GUI screens. Also covered are interclass relationships, JDBC, RMI, JavaBeans, Client-Server programming and networking.

Objectives:

The students will be able to

1. Create network based applications.
2. Make open database connectivity.
3. Develop software components (Beans).
4. Use advanced GUI components.
5. Generate HTML page dynamically by using Servlets.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	1.1 The AWT package : The Abstract Window Toolkit, Container, Frames and Panels, AWT components – Text Field, Label, Button, Choice, List Layout managers: Use of Layout, the default layout, Layout managers – Flow Layout, Grid Layout, null layout, Border Layout. 1.2 Event handling : Event source and handlers, Event categories, Event listeners and adapters – Action Listener, Item Listener, Mouse Listener, Mouse Motion Listener. 1.3 Introduction to Swing : The swing package, Swing Heavyweight Vs. Lightweight Components, Swing Features, Model View Controller Architecture.	10	16
2	2.1 Swing Components : Swing Applet, root panes, layered panes, content panes, Swing text fields, buttons, toggle buttons, checkboxes, radio buttons, scroll bars, lists, trees, tabbed panes. 2.2 Java Database Connectivity :	08	12

	Open database, ODBC structure, Database Drivers, Database client/ server methodology, Two Tier Database Design, Three Tier Database Design, Concept of connection pooling. JDBC structure, JDBC-ODBC bridge, sql package Creating database connection through application and applet, working on result set, storing, retrieving, updating data, scrolling through the data base.		
3	3.1 Network Programming : Networking basics - concept of socket, port, connection less and connection oriented communication, client server architecture The net package, Inet Address class, Socket and Server Socket class, URL class, Datagram Socket class, Datagram Packet class. 3.2 Communication between client and server : Steps in communication between server and client socket, acquiring i/o streams, data transfer between client and server sockets.	06	12
4.	4.Java Remote Method Invocation : Understanding Remote Method Invocation (RMI), Client /Server architecture, Implementing RMI, Limitations of RMI Pass by value Vs Pass by reference. RMI Architecture: RMI and Interface versus implementation, Stubs and skeletons, Bootstrapping and the RMI registry, RMI URL, Exporting remote object.	06	12
5.	5.1 Servlets : Overview of Servlets, Architecture of the servlet package, The simple Servlet, The Servlet API, Servlet Life cycle, Reading Servlet Parameters, Reading Initialization Parameters. 5.2 Servlet Client Interaction : The Javax. Servlet. http package, Handling HTTP Requests and responses, Handling GET and POST requests, Using Cookies, Session Tracking, Server-Side Session Objects and Users Security Issues, Loading and Invoking Servlets.	10	16
6.	6.1 Java Beans : Introduction, Advantages of Beans, Bean properties, Creating accessor methods for properties, Bean methods, Bound properties and Bean Persistence and events, The application builder tools, the Beans Development Kit (BDK), JAR files. 6.2 Java Servers Pages (JSP) Overview of JSP, Working of JSP, JSP Development Model, Components of JSP page(Directives, Scripting elements, Actions), Complete Example Request Dispatching, Session- Session Tracking and Session API.	08	12

Teaching Methodology – Chalkboard, Discussion, Power Point Presentation.

A) Term Work:

Skills to be developed:

i. Life Skills :

- Develop observation skills.
- Search information from various sources .

- Work as a member of team.

ii) **Intellectual Skills :**

- Prepare algorithm for developing programs.
- Use programming language constructs for program implementation.
- Write programs.
- Select appropriate programming language constructs.
- Debugging of programs.

List of Practical / Assignments / Experiments:

1. Programs using AWT components.
2. Programs using Layout managers and panels.
3. Programs using Action Listener and Item Listener.
4. Event handling for key events.
5. Handling mouse events.
6. Use of swing components.
7. Simple programs to access database using JDBC.
8. Execution of data base queries using JDBC.
9. Simple program to transfer text between client and server socket.
10. Program using InetAddress and URL class to access display the contents of a text file.
11. Programs based on Java Beans.
12. Simple programs to illustrate RMI.
13. Simple Servlet programs.
14. Use XML parser in Java.
15. A mini project using above topics.

Learning Resources:

A) Books:

SER. NO.	AUTHOR	TITLE	PUBLISHER
1	# Patrick Naughton- Herbert Schildt	Java Complete Reference – Java 2	Tata Mc Graw Hill Publications, 5 th Ed., 2002.
2	# Joseph L Weber	Using Java 2	PHI Eastern Economy Edition, 2002.
3	Jason Hunter	Java Servlet Programming	O'REILLY publications, 2 nd Edition, 2001.
4	Steven Holzner et al.	Java 2 (5 Ed.) Black Book	Dreamtech Press, 2006.

#: Text Books

B) Web sites for references:

1. <http://java.sun.com/docs/books/tutorial>
2. <http://java.sun.com/developer/Books/JDBCTutorial/>
3. http://my.execpc.com/~gopalan/java/java_tutorial.html
4. <http://www.apl.jhu.edu/~hall/java/Servlet-Tutorial/Servlet-Tutorial-Intro.html>
5. <http://www.novocode.com/doc/servlet-essentials/>
6. <http://java.sun.com/docs/books/tutorial/uiswing/>
7. <http://java.sun.com/docs/books/tutorial/uiswing/start/index.html>
8. <http://www.javabeginner.com/java-swing/java-swing-tutorial>
9. <http://www.apl.jhu.edu/~hall/java/Swing-Tutorial/>

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE – 1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Object Oriented Modelling and Design

Course Code: R14CP5413

Course Category: Specialized

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	--	25	50	175

Rationale:

The major emphasis of this course is on using object-oriented modeling to define a system specification. A study of object-oriented techniques using Unified Modeling Language (UML) for the analysis and design of software systems will be performed. Techniques for designing both the structural and behavioral aspects of software systems are emphasized. This course will cover object-oriented approaches to system analysis, data modeling and design that combine both process and data views of systems.

Objectives:

The students will be able to

1. Understand the need for, the place of, and aims of, requirements, analysis and design.
2. Thoroughly understand the practices of analysis and design (OOA and OOD).
3. Understand the practical connections between the theory of object-oriented design and the Object-oriented programming languages.
4. Become familiar with the unified modeling language (UML 1.x or UML 2.0).
5. Chose different UML diagrams for their project of interest.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1	Introduction to Object Orientation: 1.1 Elements of UML: The importance of modeling, Object Oriented modeling, Building blocks of UML - things, relationships and diagrams, Architecture: use case view, design, implementation, process and deployment, Levels of detail: visualization, specification, construction and documentation 1.2 Object-oriented concepts: Objects and classes, Links and relationships, Inheritance and polymorphism 1.3 The Unified Process: The object-oriented software life cycle, Use case-driven and architecture centric features, Iterative and incremental development, performing requirements analysis.	8	16
2	UML 2.0 : Programming In Small Versus Programming In Large, UML 2.0 History/ New Features MDA/MOF/ XMI/ CORBA, Introduction to	7	12

	UML Meta model, Extensibility Mechanisms and its usage, Introduction to OCL, Behavioral Diagrams in UML, Structural Diagrams in UML, Specification techniques of diagrams in UML.		
3	Structural Modeling: 3.1 Classes, Relationships, Class diagrams, Advance Classes- Instance and static scope, abstract, leaf and polymorphic Elements, Multiplicity, Template Class, Stereotypes used for class. 3.2 Advanced relationships generalization, association, aggregation, dependencies. (Stereotypes, Adornments, Constraints used in advanced relationships) 3.3 Packages, Instances, Object Diagram,	9	12
4	Behavioral Modeling: 4.1 Use cases – Flow of events, use case and collaboration, stereotypes used in use case, Generalization relationship between use cases and actors, Use Case Diagram, 4.2 Interaction diagrams- Interaction, Sequence diagram and Communication diagram, structured control in sequence diagram, comparison between sequence diagram and communication diagram.	10	12
5	Advanced behavioral modeling: 5.1 Activity diagrams- Branching, Forking and Joining, swimlanes, Object flow, expansion regions, signal, time event, pins, interruptible activity region, exception handling 5.2 State Machine diagrams- States, transition, advanced state and transition, Substates- Nonorthogonal, History, Orthogonal substates; Timing diagrams	8	12
6	Architectural Modeling: 6.1 Artifacts, Deployment, artifact diagram. Deployment diagram- Applications of UML in embedded systems, client/ server applications, fully distributed applications. Support for modeling Architecture in UML: Package Diagram. Components Diagram- Interfaces, Ports, Internal structure; 6.2 Forward and Reverse Engineering –Class diagram, Object diagram, sequence diagram, state machine diagram, activity diagram, use case diagram, component diagram, deployment diagram	6	16

Note: All Diagrams are to be assumed for UML 2.0 for each diagram the need, purpose, Concepts, Notation should be considered

Teaching Methodology – Chalkboard, Discussion, Power Point Presentation.

A) Term Work:

Skills to be developed:

i) **Life Skills :**

- Develop observation skills.
- Search information from various sources .
- Work as a member of team.

ii) Intellectual Skills :

- Identify the software components.
- Develop Object Oriented Approach while designing.
- Design software application using different UML diagrams.

List of Practical / Assignments / Experiments:

(Student should perform a case study report on any one real world software application)

1. Choose a hypothetical system of significant complexity and write an SRS for the same.
2. Draw one or more Use Case diagrams for capturing and representing requirements of the system. Use case diagrams must include template showing description and steps of the Use Case for various scenarios.
3. Draw one or more Package diagram to organize and manage your large and complex systems as well as their complex models.
4. Draw activity diagrams to display either business flows or like flow charts.
5. Draw basic class diagrams to identify and describe key concepts like classes, types in your system and their relationships.
6. Draw advanced class diagrams to depict advanced relationships, other classifiers like interfaces.
7. Draw sequence diagrams OR communication diagrams with advanced notation for your system to show objects and their message exchanges.
8. Draw state machine to model the behavior of a single object, specifying the sequence of events that an object goes through during its lifetime in response to events.
9. Draw component diagrams assuming that you will build your system reusing existing components along with a few new ones.
10. Draw deployment diagrams to model the runtime architecture of your system.

Learning Resources:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
01	# Grady Booch, Jacobson, Rumbaugh	The UML User Guide	Addison Wesley, 2 nd Edition, 2005.
02	Rumbaugh, Blaha	Object Oriented Modeling and Designing	PHI, 2 nd Edition, 2005.
03	Jim Arlow, Ila Neustadt	UML 2 and Unified Process: Practical Object Oriented Analysis and Design	Addison-Wesley Professional; 2 edition, 2005

#: Text Book

Web sites for references:

1. <http://uml.tutorials.tireme.com/>
2. http://pigseye.kennesaw.edu/~dbraun/csis4650/A&D/UML_tutorial/
3. <http://www.smartdraw.com/tutorials/software-uml/uml.htm>
4. <http://www-db.stanford.edu/~burback/watersluice/node55.html>

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Software Testing

Course code: R14CP5414

Course Category: Specialized

Credits : 5

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3	2	3	80	20	-	25	50	175

Rationale:

The complexity and size of today's software makes writing secure, bug-free code is extremely difficult, in such a situation testing of software before release is very essential. Software testing can be considered as "Quality Gate" which will pass/release only quality software. Students will learn how to find bugs/errors in any computer program, how to plan an effective test approach, how to clearly report findings and to tell when software is ready to release. Also it introduces various levels and types of testing so that students will be able to practically apply appropriate testing method on application. It also covers manual testing as well as expanding manual test efforts with various automation tools.

Objectives:

Students will be able to:

1. Understand how software testing fits into the software development process.
2. Learn various types and levels of software testing.
3. Develop the skills to find bugs in any type of software.
4. Learn how to effectively plan tests, communicate the bugs you find.
5. Use your new testing skill to test not just the software but also the product specification, the raw code and even the user's manual.
6. Understand STLC, test planning, test case writing and testing execution and defect management.
7. Understand the various automated testing tools to improve testing efficiency.

Course Contents:

UNI T	NAME OF THE TOPIC	HOURS	MARK S
1.	Software Testing Fundamentals: 1.1 Definition of Software Testing, Role of Testing- Failure, Error, Fault, Defect, Bug Terminology, Objectives of Testing, What Is Test Case? When To Start and Stop Testing of Software(Entry and Exit Criteria), Skills for Software Tester. 1.2 Software Quality, Quality Assurance, Quality Control, Verification and Validation, V Model	06	12

2.	2.1 White Box Testing : Classification of White Box Testing - Static Testing- Static testing by human, Static analysis tools, Structural Testing- Code Functional Testing, Unit/Code Coverage Testing, Code Complexity Testing. 2.2 Black Box Testing: Introduction, Purpose of black box testing. Techniques for Black Box Testing- Requirement Based Testing, Positive and Negative Testing, Boundary Value Analysis, Decision Tables, Equivalence Partitioning, User Documentation Testing, Graph Based Testing. Sample Examples on White and Black Box Testing.	10	16
3.	3.1 Unit Testing: Unit Testing: Driver, Stub 3.2 Integration Testing: Type of Testing- Top-Down Integration, Bottom-Up Integration, Bi-Directional Integration, Incremental Integration, Non-Incremental Integration. Scenario testing- System scenario, use case scenario. 3.3 Special Tests: Smoke Testing and Sanity Testing, Regression Testing, Usability Testing, GUI Testing, Object Oriented Application Testing: Client-Server Testing, Web based Testing	8	12
4.	System Testing and Acceptance testing: Functional Vs. Non functional test. 4.1 Functional System Testing- Design /Architecture verification, Deployment testing, Beta testing. 4.2 Non-functional system testing: Configuration testing, Entry and exit criteria, Scalability and Reliability testing, stress testing, Acceptance testing: Acceptance criteria, selecting test cases for acceptance test, executing acceptance test	8	12
5.	5.1 Test Planning : Preparing a Test Plan, Scope Management, Deciding Test Approach, Setting Up Criteria for Testing, Identifying Responsibilities, Staffing, Training Needs, Resource Requirements, Test Deliverables, Testing Tasks 5.2 Test Management: Choice of Standards, Test Infrastructure Management, Test People Management , Integrating with Product Release 5.3 Test Process: Base Lining a Test Plan, Test Case Specification, Update of Traceability Matrix, Executing Test Cases, Collecting and Analyzing Metrics, Preparing Test Summary Report 5.4 Test Reporting: Recommending Product Release.	10	16
6.	Testing Tools And Measurements 6.1 Limitations of Manual Testing and Need for Automated Testing Tools Features of Test Tool: Guideline for Static and Dynamic Testing Tool Advantages and Disadvantages of Using Tools 6.2 Selecting a Testing Tool When to Use Automated Test Tools, Testing Using Automated Tools What Are Metrics and Measurement.: Types of Metrics, Project Metrics, Progress and Productivity Metrics	6	12

Teaching Methodology – Chalkboard, Discussion, Power Point Presentation.

A) Term Work:

Skills to be developed:

i. Life Skills :

- An ability to communicate with both technical (developers) and non-technical (customers, management).

iii) Intellectual Skills :

- Judgment skills are needed to assess high-risk areas of an application on which to focus testing efforts when time is limited.
- Able to understand the entire software development process and how it can fit into the business approach and goals of the organization.
- **Quality of application is improved by software testing and quality control.**

List of Practical / Assignments / Experiments:

1. Introduction to software Testing Concepts.
2. Case Study: -Study any system specification and report bugs. Display "Hello world" Write a program to demonstrate use of
 - a. For... Loop 2) Switch.....case 3) Do...While 4) If....elseAutomate Notepad Application.
3. Automate any installation procedure (e.g. WinZip)
Automate Microsoft Word Application
 - a. Open Microsoft Word
 - b. Type text (automatically)
 - c. Generate random file name. Save file and close Microsoft Word.
4. Assignment for web Testing (use any web testing tools e.g. Selenium)
5. Create any GUI Application e.g. Calculator.
Write Test Cases for any Application (e.g. Railways reservation Form)
6. Case study on Defect Management.
7. Case study on Testing Tools and Measurements.

Learning Resources:

A) Books:

Sr. No.	Author	Title	Publisher
1	Srinivasan Desikan Gopalaswamy Ramesh	Software Testing: Principles and Practices	PEARSON
2	M G Limaye	Software Testing: Principles, Techniques and Tools	Tata McGraw-Hill
3	Ron Patton	Software testing	Pearson, 2 nd Edition

B) Web sites for references:

1. <http://www.selenium.com>
2. http://en.wikipedia.org/wiki/Test_automation
3. http://en.wikipedia.org/wiki/Software_testing#Testing_tools
4. <http://www.softwaretestingsoftware.com>

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

COMPUTER ENGINEERING DEPARTMENT

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