Cusrow Wadia Institute of Technology
Pune 411 001

COMPUTER ENGINEERING DEPARTMENT

Multi Point Entry Credit System 2018

CURRICULUM

(W. E. F. June 2018)

Cusrow Wadia Institute of Technology, Pune 1.

CURRICULUM REVISION (2018)

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 earlier revision of the curriculum was carried out in the year 2014. Review of the curriculum adopted in 2014 was taken in the subsequent years. Necessary changes in the contents and detailing of the document as regards to the outcomes, implementation strategy and assessment were done by end of academic year 2017 - 18. The present outcome based curriculum will come into force w.e.f. June 2018.
- The feedback was taken from various stake holders and it was strongly felt that with the technology advancements the rapid changes are taking place in the field of Information Technology allied processes, a dynamic curriculum need to adopt the benefits of the fast changing expectations in the contents as well as the Teaching Learning Methodology.
- 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 softwares 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 and overall development of the students is the governing factor in the revision of 2018 outcome based curriculum.

2. Approach for Curriculum Revision:

- 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.
- Scientific system approach has been adopted in the revision of this outcome based curriculum.
- A curriculum revision model showing various steps undergone is presented.
- Analysis of the existing curriculum was 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 was assessed. Basic entry qualification for Diploma is SSC or equivalent. However, higher entry qualification like 12^{th} Science, 12^{th} MCVC, ITI etc. was also considered.
- Curriculum documents of MSBTE, other Boards and other Autonomous Institutions were studied for inclusion of new courses and analysis of contents of existing and newly inducted courses and also the implementation strategy.
- The curriculum is rationalised as per the AICTE and MSBTE norms and guidelines.
- The team members were identified for collecting feedback from stake holders and interviews

with Experts for noting the suggestions about the courses and necessary modifications Interaction was carried out with expert from Industry and Academia. The faculty members were trained by specialists in Technical Education System as regards to the Curriculum Revision Process.

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. Outcome Based Education (OBE)

- The induction of India in the Washington Accord in 2014 with the permanent signatory status of The National Board of Accreditation (NBA) is considered a big leap forward for the higher-education system in India. It means that an Engineering graduate from India can be employed in any one of the other countries who have signed the Washington accord. For Indian Engineering Institutions to get accredited by NBA according to the pacts of the accord, it is compulsory that engineering institutions follow the Outcome Based Education (OBE) model.
- Cusrow Wadia Institute of Technology has adopted Outcome Based Education (OBE) model in revision of its curriculum effective from year 2018. Development of curriculum based on OBE model is a noteworthy step towards further improvement in quality of technical education at polytechnic level in this institute.
- Outcome based education (OBE) is student-centered teaching learning model that focuses on measuring student's performance through outcomes. Outcomes include knowledge, skills and attitudes. Its focus remains on evaluation of outcomes of the program by stating the knowledge, skill and behaviour a diploma holder is expected to attain upon completion of every course (Course Outcomes) and after three years of diploma program (Program Outcomes). Program specific outcomes (PSO's) are statements that describe what the graduates of a specific engineering program should be able to do.
- This OBE model measures the progress of the diploma holder in three parameters, which are
    - Program Educational Objectives (PEO)
    - Program Outcomes (PO)
    - Course Outcomes (CO)
- Program Educational Objectives (PEO) are broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve. PEO's are measured 4-5 years after graduation.
- Program outcomes are narrower statements that describe what students are expected to know and be able to do by the time he/she completes diploma education. They must reflect the seven Graduate attributes as described by NBA for polytechnic education programs. Course outcomes are the measurable parameters which evaluates each students performance for each course that the student undertakes in every semester.

5. Analysing Job Functions and Deriving Curriculum Outcomes:

- Vision and Mission of the programme were framed.
- The role of Diploma holder as a technician on the job is analysed in the four 'Program Educational Objectives (PEO)' mapped with mission of the Department.
- The Program Outcomes (PO) suggested by NBA is incorporated with proper thought and understanding and two 'Program Specific Outcomes (PSO)' were defined after discussion with stake holders.
- Course Outcomes (CO) for each course is defined and mapped with POs and PSOs
- The courses common to several programmes and the courses relevant to particular programmes were classified under various categories.
- The overall course structure and Teaching Examination Scheme was prepared.
- The contents of various courses were finalised by considering the feedback from stake holders through interviews, and discussions.
- The course structure and the contents were validated by the Board of Studies.
- Study of the Diploma programmes offered by MSBTE, other State Boards and other Autonomous Institutions was done to widen the perspective.

6. Evolving the teaching learning process:

The following points were considered:

- No. of weeks – 16
- Average days per week- 5.5
- 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.

7. Course Categories:

- Foundation (1)
- Allied (2)
- Core (3)
- Applied (4)
- Specialized (5)
- Number of courses for a programme – 37
- Number of courses for award of class – 11
- Number of Elective courses – 6
- Number of credits to be earned for obtaining Diploma – 191.
- One credit = one hour of lecture or one hour of practical per week for a course.
- Ratio of theory to practical hours per week : approx. 55:45

8. Examination scheme:

- Theory paper – 80 marks
- Tests – 20 marks
- Term Work – 25,50,75,100 marks
- Practicals – 25,50 marks
- Viva voce - 25,75 marks

- Project Work - 100 + 50 marks
- Grand total – 4700 marks
- Grand total of marks for award of class – 1700.

9. Course-wise content detailing:

- For finalisation of course structure from Courses Committee, 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. R18CP1401. 'R18' means the course is from the curriculum revised in 2018. CP implies Computer Engineering Department will teach this course. '1' indicates that it is Foundation Course Category in the programme structure. '4' means the course is to be taught by Computer Engineering programme. '01' is the serial number of the course in Foundation Course Category.

  The 7th character in the above 9 digit code is assigned for the programme, e.g. 1 – Computer, 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 proficiency expected to be developed through the course is defined. The course outcomes are derived indicating the purpose to teach the course.
- The inputs for student activities 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.

10. 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/updated in respect of various aspects and methods of evaluation systems, paper setting etc.
- Faculty will be trained/updated 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. 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 – 50 MBPS internet connection is available for faculty, staff and students.Wi-Fi connectivity provided in laboratories.

- Uninterrupted Power Supply and captive power is made available to take over the load shedding.
- The laboratories, equipments and computers be maintained in working conditions.
- 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, technologies.
- The students should imbibe various life skills, soft skills, learn stress management and adjust help and appreciate colleagues especially during group activities, study tours and visits etc.

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Vision And Mission of The Institute

Vision

To be a resourceful institute that develops technically competent and socially responsible citizen for futuristic needs of industry and society.

Mission

M1: To impart technical knowledge and skills along with ethical and social values

M2: To continually enhance curricula and learning resources as per latest trends in technology.

M3: To develop the faculty and enable them to implement innovative teaching methods.

M4: To strengthen association with industry and alumni.

M5: To adopt and implement various e-governance practices for benefits of stake-holders.

Vision and Mission of the Computer Engineering Department

Vision

Vision : To be a centre of excellence for Computer Engineering education that provides value based quality technical education.

Mission

- To inculcate social and ethical values along with technical proficiency
- To enhance curricula in tune with technological developments
- To develop faculty and infrastructure for effective implementation of curricula
- To strengthen association with industry and alumni

Cusrow Wadia Institute of Technology, Pune 1.

Program Educational Objectives (PEOs)

PEO 1: Pursue career in Computer Software Design and Development.

PEO 2: Lead interdisciplinary projects.

PEO 3: Start own enterprise or be an IT consultant.

Program Outcomes (POs)

PO1: *Basic and Discipline specific knowledge* - Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

PO2: *Problem analysis* - Identify and analyse well-defined engineering problems using codified standard methods.

PO3: *Design/development of solutions* - Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.

PO4: *Engineering Tools, Experimentation and Testing* - Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.

PO5: *Engineering practices for society, sustainability and environment* - Apply appropriate technology in context of society, sustainability, environment and ethical practices.

PO6: *Project Management* - Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.

PO7: *Life-long learning* - Ability to analyse individual needs and engage in updating in the context of technological changes.

Program Specific Outcomes (PSOs)

PSO1: Troubleshoot hardware and network problems.

PSO2: Create web and multimedia applications.

PSO3: Pursue higher education for professional development and career growth.

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 2018

Sr. No.	Category	Course Code	Course Title	Pre-requisite	GRp	C/O	Teaching Scheme			Examination Scheme					
							L	P/T	Credits	TH	TT	PR	OR	TW	TOTAL
01	Foundation Courses	R18SC1701	Basic Mathematics			C	4	1*	5	80	20	-	-	-	100
02		R18SC1710	Engineering Mathematics			C	4	1*	5	80	20	-	-	-	100
03		R18SC1703	Basic Physics			C	2	2	4	40	10	-	-	25	75
04		R18SC1706	Engineering Physics			C	2	2	4	40	10	-	-	25	75
05		R18SC1707	English			C	2	2	4	80	20	-	-	25	125
06		R18SC1708	Business Communication			C	1	2	3	-	-	-	@25	25	50
07		R18ME1210	Engineering Graphic Skills			C	2	4	6	-	-	-	-	50	50
08		R18CP1401	Computer Fundamentals			C	3	4	7	80	20	-	-	50	150
09		R18EX1415	Electronic Devices & Comp			C	4	2	6	80	20	-	-	50	150
		Total					**26**	**18**	**44**	**480**	**120**		**25**	**250**	**875**
10	Allied courses	R18ME2203	Industrial Org. & Management			C	3	-	3	80	20	-	-	-	100
11		R18EE2310	Electrical Engineering			C	3	2	5	80	20	-	-	50	150
12		R18ME2210	Workshop Practice			C	-	4	4	-	-	-	-	50	50
13		R18EE2302	Marketing Management		A	O2	1	2	3	-	-	-	@25	25	50
14		R18ME2208	Entrepreneurship Development				1	2	3	-	-	-	@25	25	50
15		R18SC1715	Aptitude Test Skills				1	2	3	-	-	-	@25	25	50
16		R18CP2401	Environmental Studies			C	2	1	3	-	-	-	@25	25	50
		Total					**10**	**11**	**21**	**160**	**40**	**-**	**75**	**175**	**450**
17	Core courses	R18CP3401	Programming in C			C	3	4	7	80	20	@25	-	50	175
18		R18CP3402	Operating Systems			C	4	-	4	80	20	-	-	-	100
19		R18CP3403	Data Structures	R18CP3401		C	3	4	7	80	20	-	25	50	175
20		R18CP3404	Object Oriented Programming with C++			C	4	2	6	80	20	@25	-	50	175
21		R18CP3405	Microprocessors & Programming	R18EX3415		C	4	2	6	80	20	-	@25	50	175
22		R18CP3406	Database Management Systems			C	4	2	6	80	20	25	-	50	175
23		R18CP3407	Computer Networks			C	4	2	6	80	20	-	-	50	150
24		R18CP3408	Software Engineering			C	4	2	6	80	20	-	-	50	150
25		R18CP3409	Data Communication			C	3	2	5	80	20	-	25	50	175
26		R18EX3415	Digital Techniques			C	3	2	5	80	20	-	-	50	150
		Total					**36**	**22**	**58**	**800**	**200**	**75**	**75**	**450**	**1600**
27	Applied courses	R18CP4401	Web Design			C	2	2	4	-	-	50	-	50	100
28		R18CP4402	User Interface Programming			C	2	2	4	-	-	50	-	50	100
29		R18CP4403	P. C. Maintenance			C	4	2	6	80	20	-	@25	50	175
30		R18CP4404	Linux Operating System	R18CP3402		C	4	2	6	80	20	-	25	50	175
31		R18CP4405	Project and Seminar	100 Credits		C	-	6	6	-	-	-	50	100	150
32		R18CP4406	Industrial Training			C	-	6#	6#	-	-	-	75	75	150
		Total					**12**	**20**	**32**	**160**	**40**	**100**	**175**	**375**	**850**
33	Specialized courses	R18CP5401	Java Programming	R18CP3404		C	3	4	7	80	20	25	-	50	175
34		R18CP5402	Multimedia Techniques			C	4	2	6	80	20	-	-	50	150
35		R18CP5403	PHP Programming		B	O1	3	4	7	80	20	-	25	50	175
36		R18CP5404	Mobile Computing				3	4	7	80	20	-	25	50	175
37		R18CP5405	Python Programming		C	O1	4	2	6	80	20	-	25	50	175
38		R18CP5406	Computer Security	R18CP3407			4	2	6	80	20	-	25	50	175
39		R18CP5407	Advanced Java Programming	R18CP5401	D	O1	3	2	5	80	20	-	25	25	150
40		R18CP5408	Advanced Computer Networks	R18CP3407			3	2	5	80	20	-	25	25	150
41		R18CP5409	Animation Techniques		E	O1	1	4	5	-	-	-	50	50	100
42		R18CP5410	Network Administration	R18CP3407			1	4	5	-	-	-	50	50	100
		Total					**18**	**18**	**36**	**400**	**100**	**25**	**125**	**275**	**925**
		Grand Total					**102**	**89**	**191**	**2000**	**500**	**200**	**475**	**1525**	**4700**

@: Internal Examination * Counted in Theory Credits

#: Six weeks industrial training is compulsory after fourth semester (i.e. May to June). Though six credits are allocated for Industrial Training, it is only for awarding marks. As far as teaching load/time table preparation is considered, each faculty would be assigned with one batch of students (equivalent to practical batch size) for guiding the preparation of industrial training report and its evaluation. For this purpose one hour (or two hours on working Saturday) teaching load would be considered.

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	-	26	18	44	600	-	25	250	875
2	Allied	4	2	10	11	21	200	-	75	175	450
3	Core	10	-	36	22	58	1000	75	75	450	1600
4	Applied	6	-	12	20	32	200	100	175	375	850
5	Specialized	2	4	19	18	37	500	25	125	275	925
Total		31	6	102	83	191	2500	200	475	1525	4700

- Total Credits : 191
- Total Marks : 4700
- Total No. of Courses to complete the Program : 37
- Total No. of Theory Exams : 26
- Total No. of Practical / Oral exams : 21
- Theory credits to Non-Theory credits Ratio : 55: 45
- Theory marks to Non-Theory marks Ratio : 55:45

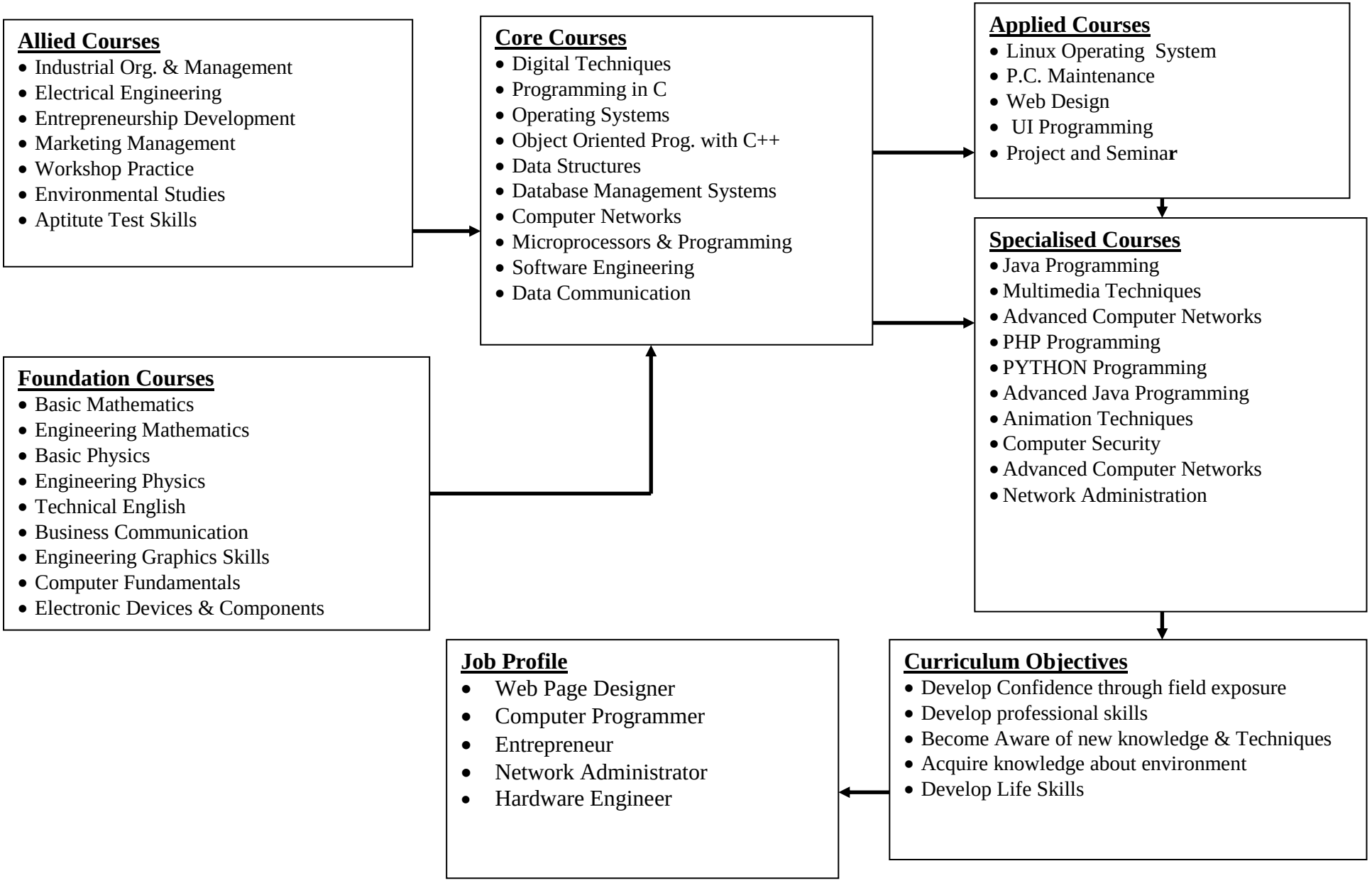
COURSES FOR CLASS DECLARATION :

NO. OF COURSES: 11 COMPULSORY COURSES: 7 OPTIONAL COURSES: 3 INPLANT TRAINING: 1

Category	Course Code	Course Title	Pre-requisite	Group	Comp/ Opt.	L	P	Credits	Examination Scheme					Total
									TH	TT	PR	OR	TW	
Allied courses	R18ME2203	Ind. Org. & Management			C	3	-	3	80	20	-	-	-	100
Core courses	R18CP3407	Computer Networks			C	4	2	6	80	20	-	-	50	150
	R18CP3408	Software Engineering			C	4	2	6	80	20	-	-	50	150
Applied Courses	R18CP4404	Linux Operating System	R18CP3402		C	4	2	6	80	20	-	25	50	175
	R18CP4405	Project and Seminar	100 Credits		C	-	6	6	-	-	-	50	100	150
	R18CP4406	Industrial Training			C	-	6	6	-	-	-	75	75	150
Specialized Courses	R18CP5401	Java Programming	R18CP3404		C	3	4	7	80	20	25	-	50	175
	R18CP5402	Multimedia Techniques			C	4	2	6	80	20	-	-	50	150
	R18CP5403	PHP Programming		B	O1	3	4	7	80	20	-	25	50	175
	R18CP5404	Mobile Computing				3	4	7	80	20	-	25	50	175
	R18CP5405	Python Programming		C	O1	4	2	6	80	20	-	25	50	175
	R18CP5406	Computer Security	R18CP3407			4	2	6	80	20	-	25	50	175
	R18CP5407	Advanced Java Programming	R18CP5401	D	O1	3	2	5	80	20	-	25	25	150
	R18CP5408	Advanced Computer Networks	R18CP3407			3	2	5	80	20	-	25	25	150
	Total					**32**	**32**	**64**	**720**	**180**	**25**	**225**	**550**	**1700**

- Max. Theory Marks : 900
- Max. Practical/Oral Marks : 250
- Max. Term Work Marks : 550
- Grand Total : 1700
- Theory Credits To Non-Theory Credits Ratio : 50 : 50
- Theory Marks To Non-Theory Marks Ratio : 55 : 45

Link Diagram for Diploma in Computer Engineering :



CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE – 411001
PROGRAMME: DIPLOMA IN COMPUTER ENGINEERING

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CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME: CIVIL/MECH./ELECT./COMP./E&TC. ENGINEERING
COURSE: BASIC MATHEMATICS COURSE CODE: R18SC1701

COURSE CATEGORY : FOUNDATION CREDIT : 5

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme						
TH	PR	TU	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
4	-	1	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. Hence the course provides the ability to analyze Engineering problems using determinants, matrices, trigonometry, statistics and graphs.

Course Outcomes:

1. Apply the rules and formulae of trigonometry to solve engineering problem.
2. Use determinant and matrices to solve simultaneous equations for engineering problem.
3. Analyze the given data using measures of central tendency and dispersion.
4. Plot the graph of functions used in Engineering field.

Course Details:

The following topics/subtopics should be taught and assessed in order to develop LOs in cognitive domain for achieving the COs.

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS	MARKS
Unit 1 **Trigonometry**	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 and allied angles. 1.3 Trigonometric ratios of multiple and sub-multiple angles.	1a. Apply the concept of Compound angle, allied angle, and multiple angles to solve the given simple engineering problem(s). 1b. Apply the concept of Sub-multiple angle to solve the given simple engineering related problem(s).	12	12
Unit 2 **Trigonometry**	2.1 Factorization and de-factorization formulae. 2.2 **Inverse Circular function** Definition of inverse circular function. Principal value of inverse circular function. Properties of inverse circular	2a. Apply concept of factorization and de-factorization formulae to solve the given simple engineering problem(s). 2b. Investigate given simple problems utilizing inverse trigonometric	10	**12**

	function.	ratios.		
Unit 3 **Algebra**	**3.1 Determinant:** Definition of determinants. Problems on expansion of determinants of order 3. Solution of simultaneous equation in three unknowns (Cramer's Rule). **3.2 Partial Fractions:** Definition of fraction, proper and improper fraction. Resolve the given proper fraction into partial fraction for the cases a. Factors of denominator are linear and non-repeated b. Factors of denominator are linear but repeated. c. Factors of denominator are quadratic, non-repeated and irreducible	3a. Calculate the area of the given triangle with vertices A, B, C using determinant. 3b. Solve the system of linear equations using determinant method for given simple engineering problem. 3c. Resolve the given proper fraction into partial fractions.	14	16
UNIT 4 **Matrices**	**Matrices:** 4.1 Definition of a Matrix. Types of Matrices. 4.2 Algebra of matrices: Addition, subtraction and multiplication of matrices. 4.3 Transpose of a matrix. Adjoint of a matrix. Inverse of a matrix by adjoint method. 4.4 Solution of simultaneous equation by matrix method.	4a. Solve the system of linear equations using matrix method and determinant method for given simple engineering problem.	12	16
Unit 5 **Statistics**	**Measures of dispersion:** 5.1 Mean deviation about mean of raw, ungrouped and grouped data. 5.2 Standard deviation of raw, ungrouped and grouped data. 5.3 Variance and coefficient of variation. 5.4 Comparison of two sets.	5a. Calculate the mean deviation of the given statistical observations of an experiment 5b. Calculate the standard deviation, variance and coefficient of variation of the given data 5c. Justify the consistency of the given simple sets of data	8	12
Unit 6 **Functions**	6.1 **Functions and Limits:** Definition of functions and Notation. Different types of functions. Limits -Concept of limits 6.2 **Graphs:** Graph of linear function. Graph of quadratic equation. Graph of trigonometric function. Graph of exponential function.	6a. Find the value of the given function 6b. Plot the graph of the given simple function	8	12

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Trigonometry	**12**	**2**	**4**	**6**	**12**
2	Trigonometry	10	**2**	**4**	**6**	**12**
3	Algebra	14	**4**	**4**	**8**	**16**
4	Matrices	12	**4**	**4**	**8**	**16**
5	Statistics	8	**-**	**6**	**6**	**12**
6	Functions	8	**2**	**4**	**6**	**12**
	Total	**64**	14	26	40	**80**

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

SUGGESTED EXERCISES/PRACTICALS

S. No.	Unit No.	Tutorials	Appro. Hrs. Required
1	3	Solve problems on determinant to find area of triangle, and solution of simultaneous equation by Cramer's Rules.	1
2	4	Solve elementary problems on Algebra of matrices.	1
3	4	Solve elementary problems on Algebra of matrices.	1
4	4	Solve solution of Simultaneous Equation using inversion method.	1
5	3	Resolve into partial fraction using linear non repeated, repeated linear factors.	1
6	3	Resolve into partial fraction using quadratic, irreducible factors.	1
7	1	Solve problems on Compound and Allied angles	1
8	1	Solve problems on multiple and sub-multiple angles	1
9	2	Practice problems on factorization and de factorization formula	1
10	1&2	Solve problems on trigonometry (All mixed)	1
11	2	Solve problems on inverse circular trigonometric ratios.	1
12	5	Solve problems on finding mean deviation about mean.	1
13	5	Solve problems on standard deviation.	1
14	5	Solve problems on coefficient of variation, comparison of two sets.	1
15	6	Solve problems on functions	1
16	6	Plot the graph of the given function	1
Total			**16**

SUGGESTED STUDENT ACTIVITIES

1. Identify engineering problems based on real world problems and solve with the use of free tutorials available on the internet.
2. Use graphical software: EXCEL, DPLOT and GRAPH for related topics.
3. Prepare a seminar on any relevant topic.

SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

I. Massive open online courses (***MOOCs***) may be used to teach various topics/sub topics.
II. ***'L' in item No. 4*** does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
III. About ***15-20% of the topics/sub-topics*** which is relatively simpler or descriptive in nature is to be given to the students for ***self-directed learning*** and assess the development of the UOs/COs through classroom presentations

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication
1	Higher Engineering Mathematics	Grewal, B.S.	Khanna publications, New Delhi, 2015 ISBN: 8174091955
2	Advanced Engineering Mathematics	Krezig, Ervin	Wiley Publications, New Delhi, 2014 ISBN :978-0-470-45836-5
3	Engineering Mathematics (third edition).	Croft, Anthony	Pearson Education, New Delhi, 2014 ISBN 978-81-317-2605-1
4	Advanced Engineering Mathematics	Das, H.K.	S. Chand & Co.; New Delhi; 2008, ISBN-9788121903455

B) Major Equipment/ Instrument with Broad Specifications

C) Software/Learning/ Simulations Websites

www.dplot.com/ - DPlot
www.allmathcad.com/ - MathCAD
www.wolfram.com/mathematica/ - Mathematica
https://www.khanacademy.org/math?gclid=CNqHuabCys4CFdOJaAoddHoPig
www.easycalculation.com
www.math-magic.com

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1				1			
CO2	3	2	1				1			
CO3	3	2	1				1			
CO4	3	2	1				1			

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: ELECT/COMP/E&TC ENGINEERING

COURSE: ENGINEERING MATHEMATICS **COURSE CODE: R18SC1710**

COURSE CATEGORY : FOUNDATION **CREDIT : 5**

Teaching and Examination Scheme:

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

Course Outcomes:

1. Apply the rules and methods of derivatives to engineering field.
2. Evaluate integration of a function as anti derivative.
3. Apply appropriate methods of integration to engineering problem.
4. Apply appropriate methods of differential equation to engineering problems.
5. Convert the given complex number to its polar form.

Course Details:

UNIT	NAME OF THE TOPIC (with Details)	LEARNING OUTCOME	HOURS	MARKS
Unit 1 **Derivatives**	**Derivatives:** 1.1 Concept and definition of derivative. Derivatives of standard functions. 1.2 Laws of derivatives :- Addition law. Subtraction law. Multiplication law. Division law.	1a. Solve the given simple problems based on rules of differentiation.	8	12
Unit 2 **Derivatives**	2.1 Derivatives of composite functions (Chain rule)	2a. Solve the given problems of differentiation for composite functions.	12	12

	Methods of Derivatives: 2.2 Derivative of parametric functions. 2.3 Derivative of implicit functions. Concept of higher order derivatives	2b. Solve the given problems of Differentiation for parametric and implicit functions.		
Unit 3 **Integration**	**Integration** 3.1 Definition of integration as anti-derivative. 3.2 Integration of algebraic functions. 3.3 Integration by substitution. 3.4 Integration by parts. 3.5 Integration by partial fraction	3a. Obtain the given simple integral(s) using substitution method. 3b. Integrate given simple functions using the integration by parts. 3c. Evaluate the given simple integral by partial fractions.	16	16
Unit 4 **Application of Derivatives & Integration**	**Application of Derivatives:** 4.1 Geometrical meaning of derivative. (slope of tangent and normal to the given curve) 4.2 Maxima and minima using derivative. **Application of Integration:** 4.3 Mean value of the function 4.4 Root mean square value	4a. Apply the concept of differentiation to find slope of tangent and normal to the given curve. 4b. Apply the concept of differentiation to calculate maxima and minima of given problem. 4c. Invoke the concept of definite integration to find the mean value and RMS value of the function.	8	16
Unit 5 **Differential Equation**	**Differential Equation:** 5.1 Definition of differential equation. Order and degree of differential equation. 5.2 Solution of differential equation of 1^{st} order and 1^{st} degree. Variable separable differential equation. Linear differential equation.	5a. Find the order and degree of the differential equation. 5b. Solve the differential equation using the method of variable separable for the given engineering problem. 5c. Solve the linear differential equation for the given engineering problem.	10	12

Unit 6 **Complex Number**	**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 Modulus and amplitude of complex number. Polar form of a complex number.	6a. Solve the given problem using algebra of complex numbers. 6b. Express the given complex number in polar form. 6c. Find the powers of complex number using De-Moivre's theorem.	10	**12**

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	**Derivatives**	8	**4**	**8**	**-**	**12**
2	**Derivatives**	12	**-**	**8**	**4**	**12**
3	**Integration**	16	**4**	**4**	**8**	**16**
4	**Application of Derivatives & Integration**	8	**-**	**4**	**12**	**16**
5	**Differential Equation**	10	**4**	**-**	**8**	**12**
6	**Complex Number**	10	**2**	**2**	**8**	**12**
Total		**64**	**14**	**26**	**40**	**80**

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

SUGGESTED EXERCISES/PRACTICALS

Sr. No.	Unit No.	Tutorials	Appro. Hrs. Required
1	1	Solve the given simple problems based on rules of differentiation.	1
2	2	Solve the given problems based on chain rule of differentiation	1
3	2	Solve the given problems of differentiation on parametric functions.	1

Sr. No.	Unit No.	Tutorials	Appro. Hrs. Required
4	2	Solve the given problems of differentiation on logarithmic functions.	1
5	1 &2	Solve engineering problems on differentiation.	1
6	3	Solve the given simple integral(s) as anti derivative.	1
7	3	Solve the given integral(s) using substitution method.	1
8	3	Solve the given integral(s) using integration by parts and by partial fraction.	1
9	3	Solve engineering problems on integration.	1
10	4	Solve problems on slope of tangent and normal at given point on the curve and on finding maxima minima of function.	1
11	4	Solve problems on finding Mean value and RMS value of the function.	1
12	4	Solve engineering problems on application of differentiation and integration.	1
13	5	Find order and degree of given differential equation.	1
14	5	Solve differential equation based on variable separable and Linear differential equation.	1
15	6	Express the given complex number in a + ib form and polar form.	1
16	6	Find the powers of complex number using De-Moivre's theorem.	1
Total			**16**

SUGGESTED STUDENT ACTIVITIES

1. Identify engineering problems based on real world problems and solve with the use of free tutorials available on the internet.
2. Use graphical software: EXCEL, DPLOT and GRAPH for related topics.
3. Prepare a seminar on any relevant topic based on application of integration.
4. Prepare a seminar on any relevant topic based on application of differentiation.

SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

I. Massive open online courses (***MOOCs***) may be used to teach various topics/sub topics.

II. ***'L' in item No. 4*** does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.

III. About ***15-20% of the topics/sub-topics*** which is relatively simpler or descriptive in nature is to be given to the students for ***self-directed learning*** and assess the development of the UOs/COs through classroom presentations

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication
1	Higher Engineering Mathematics	Grewal, B.S.	Khanna publications, New Delhi, 2015 ISBN: 8174091955
2	Advanced Engineering Mathematics	Krezig, Ervin	Wiley Publications, New Delhi, 2014 ISBN :978-0-470-45836-5
3	Engineering Mathematics (third edition).	Croft, Anthony	Pearson Education, New Delhi, 2014 ISBN 978-81-317-2605-1
4	Advanced Engineering Mathematics	Das, H.K.	S. Chand & Co.; New Delhi; 2008, ISBN-9788121903455

B) Software/Learning/ Simulations Websites

www.dplot.com/ - DPlot
www.allmathcad.com/ - MathCAD
www.wolfram.com/mathematica/ - Mathematica
https://www.khanacademy.org/math?gclid=CNqHuabCys4CFdOJaAoddHoPig
www.easycalculation.com
www.math-magic.com

Mapping matrix of CO- PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1				1			
CO2	3	1	1				1			
CO3	3	1	1				1			
CO4	3	1	1				1			
CO5	3	1	1				1			

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME IN: COMPUTER ENGINEERING

COURSE: BASIC PHYSICS **COURSE CODE: R18SC1703**

COURSE CATEGORY: FOUNDATION **CREDITS: 4**

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	ONLINE EXAM	TH	TEST	PR	OR	TW	TOTAL
2	2	1 HR	40	10	-	-	25	75

Rationale:

Basic Sciences like Physics is the pillar of engineering and technology. It is very essential to learn the basic sciences to understand the fundamental concepts and principles. The course content is chosen so that it should be more relevant to fulfill the needs of industries. The study of basic principles in Heat, Electricity, Magnetism and Semi-Conductors will help in understanding the technical courses where emphasis is on application of these in various fields.

Course Outcomes:

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Estimate errors in measurements of a physical quantity measured with appropriate measuring instruments.
2. Apply principles of Electricity, Magnetism and Semi-Conductors to solve engineering problems.
3. Apply Gas laws and use basic principle of Heat and Temperature to related engineering problems.

Course Details:

The following topics/subtopics should be taught and assessed in order to develop UOs in cognitive domain for achieving the COs.

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS	MARKS
1	**Units and Measurements** 1.1Physical quantity, fundamental and derived physical quantity with examples. Unit of physical quantity, fundamental units with examples and derived units with examples. 1.2 System of units (C.G.S., M.K.S., F.P.S. and S.I.) Rules and Conventions for writing units in SI system. Tables of fundamental and derived S.I. units. Multiples and sub multiples of units. Significant figures, rules for determining the significant	1a.Describe the concept of given physical quantities with relevant unit of measurement. 1b. State various systems of units and its need for the measurement of the given physical quantities. 1c.Determine the dimensions of given physical quantities. State the error in the given measurement with	**9**	12

	figures. 1.3 Dimensions and dimensional formulae 1.4 Errors, types of errors (Instrumental, systematic and random error) and methods for minimization of errors, 1.5 Estimation of errors (Absolute error, average absolute error, relative error and percentage error), Propagation of errors in measurement, Numerical	justification.		
2	**Electricity, Magnetism and Semiconductors** 2.1 Concept of charge, Coulomb's inverse square law, Electric field, Electric lines of force and their properties, Electric field intensity, Electric potential and potential difference , Electric flux density, Electric current, Ohm's law, Specific resistance, Resistance by using colour code, Laws of series and parallel resistance, Heating effecting of electric current, Electric power, Electric energy in kWh, Electric bill, Numerical. 2.2 Magnetic field, magnetic field intensity and their units, Magnetic lines of force and their properties, magnetic flux. 2.3 Conductors, semiconductors, insulators and their energy band diagrams. 2.4 Intrinsic or pure semiconductor, extrinsic or impurity doped semiconductors, pentavalent impurity doped N-type semiconductor and trivalent impurity doped P-type semiconductor. p-n junction diode 2.5 Forward and reverse biasing of p-n junction diode, I-V characteristics of p-n junction, and applications of p-n junction diode.	2a. Calculate electric field, potential and potential difference of the given static charge. 2b. Describe the concept of given magnetic intensity and flux with relevant units. 2c. Explain the heating effect of the electric current. 2d. Apply laws of series and parallel combination in the given electric circuits. 2e.Distinguish the given conductors, semiconductors and insulators on the basis of energy bands. 2f. Explain the I-V characteristics and applications of the given p-n junction diodes.	**14**	**16**

3	**Heat , Temperature and Gas laws** 3.1 Heat, units of heat, calorie-joule conversion, Latent heat and sensible heat. Temperature, Temperature scales, Absolute zero temperature, relations of temperatures on Celsius scale, Fahrenheit scale and Kelvin scale, Difference between heat and temperature, Numerical. 3.2 Conduction, Flow of heat along a bar, Steady state of temperature Coefficient of thermal conductivity by Searle's method. (For good conductor), Convection, Radiation, Comparison of conduction, convection and radiation.. 3.3 Applications of conduction, convection and radiation, Thermal Expansions (linear, areal, cubical), Numerical. 3.4 Principle, Construction and working of Bimetallic thermometer, Resistance thermometer and Thermocouple thermometer 3.5 Boyle's law, Charle's law and Gay–Lussac's law. General gas equation, Specific heats (Cp, Cv) of gases and their ratio, Numerical.	3a. Convert the given temperature in different temperature scales. 3b. Distinguish the properties of the good and bad conductors of heat. 3c. Relate the characteristics of the three gas laws.	9	12

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Units and Measurements	9	3	5	4	12
II	Electricity, Magnetism and Semiconductors	14	5	5	6	16
III	Heat , Temperature and Gas laws	9	3	5	4	12
	Total	32	11	15	14	40

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

SUGGESTED PRACTICALS

The practical in this section are psychomotor domain PrOs (i.e sub-components of the COs), to be developed and assessed in the student to lead to the attainment of the competency. Any 10 practical of Physics & Chemistry should be conducted during the Term.

SUGGESTED EXERCISES/PRACTICALS

Sr. No.	Unit No.	Tutorials	Appro. Hrs. Required
1	I	Measurement of (i) Length, Breadth and Height of a block ,(ii) Internal, External diameter and Height of a hollow cylinder, Using Vernier Callipers of different least counts.	4
2	I	Measurement of (i) Diameter of Sphere and Wire, (ii) Thickness of a plate by using Micrometer Screw Gauge.	4
3	I	Measurement of (i) Radii of concave and convex surfaces, (ii) Thickness of plate by using Spherometer.	2
4	II	Measurement of Specific resistance by voltmeter ammeter method.	2
5	II	Verification of Ohm's law	2
6	II	Measurement of Resistance in series.	2
7	II	Measurement of Resistance in parallel.	2
8	II	Magnetic lines of forces of Bar Magnet.	2
9	II	Study of PN junction diode forward and reverse bias	2
10	II	Study the effect of temperature on the resistance of – thermistor and copper coil.	2
11	II	Determination of co-efficient of thermal conductivity of a good conductor by Searle's method.	2
12	III	Verification of Boyle's law.	2
13		Practical –assignments-student activities submission	4

SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related co-curricular activities which can be undertaken to accelerate the attainment of the various outcomes in this course:

1) Prepare charts of vernier calliper, micrometer screw gauge, spherometer and travelling microscope.
2) Library survey regarding engineering material used in different industries.
3) Seminar on any relevant topic.

SPECIAL INSTRUCTIONAL STRATEGIES

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

i. Massive open online courses (MOOCs) may be used to teach various topics/sub topics.
ii. Not only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.

iii. About 15-20% of the topics/sub-topics which is relatively simpler or descriptive in nature is to be given to the students for self-directed learning and assess the development of the UOs/COs through classroom presentations (see implementation guideline for details).
iv. Teachers need to ensure to create opportunities and provisions for co-curricular activities.

SUGGESTED LEARNING RESOURCES

A. Books

Sr. No.	Title of Book	Author	Publication
1	Physics Textbook XI (part1 &2)	J.V.Naralikar,A.W.Joshi	National Council of Education Research and Training New Delhi
2	Physics Textbook XII (part1 &2)	J.V.Naralikar,A.W.Joshi	National Council of Education Research and Training New Delhi
3	Fundamentals of Physics	D.Haliday & R. Resnick	Jhon Wiley and Sons , USA
4	Engineering Physics	R.K.Gaur, S.L.Gupta	Dhanpat Rai and Sons Publications.

B. Web site for references:

1. www.physicsclassroom.com
2. www.hyperphysics.com
3. www.physicsinfo.com http://nptel.ac.in/course.php?disciplineId=115
4. http://nptel.ac.in/course.php?disciplineId=104
5. http://hperphysics.phy-astr.gsu.edu/hbase/hph.html
6. www.physicsclassroom.com
7. www.physics.org
8. www.fearofphysics.com
9. www.sciencejoywagon.com/physicszone
10. www.science.howstuffworks.com
11. www.in.wikipedia.org
12. www.nptel.iitm.ac.in

C. Video

- www.Youtube.com (elasticity, surface tension, viscosity, sound)

D. PPT

1. www.khanaacademy.com
2. www.slidehare.net

Mapping matrix of CO - PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	1	1	3	2	1
CO2	3	1	1	1	1	1	1	3	1	1
CO3	3	1	1	1	1	1	1	3	1	1

DIPLOMA PROGRAMME IN: COMPUTER ENGINEERING

COURSE: ENGINEERING PHYSICS **COURSE CODE: R18SC1706**

COURSE CATEGORY: FOUNDATION **CREDITS: 4**

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME		EXAMINATION SCHEME						
TH	PR	ONLINE EXAM HRS	TH	TEST	PR	OR	*TW	TOTAL
2	2	1	40	10	-	-	25	75

***TW includes 10 marks for Science Micro Project.**

RATIONALE

Diploma engineers have to deal with various materials, methods and machines. Adequate knowledge of basic principle of Physics will help the students to understand the concepts better in any field of engineering. The course will develop analytical capabilities of students so that they can characterize transform and use material in engineering and apply knowledge gained in solving related engineering problems. It will develop the habit of scientific reasoning in students so that they can work with open and enquiring mind. They must learn and apply the concepts and principles of science like Electricity, Magnetism and LASERS.

COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Select appropriate Capacitors and Resistance in circuits.
2. Apply the principle of Electricity and magnetism for use of various measuring instruments.
3. Use equipments based on principle of LASER and Optical fibre in industrial application.

Course Details:

UNIT	NAME OF THE TOPICS AND SUBTOPICS	LEARNING OUTCOMES	HOURS	MARKS
1	**1. Current Electricity, Capacitors and Capacitance** 1.1Concept of EMF of cell, internal resistance of cell, difference between EMF and potential difference, Kirchhoff's laws. 1.2 Wheatstone's bridge, balancing condition of Wheatstone's bridge, Meter bridge, 1.3 Potentiometer, principle of potentiometer, potential gradient, balancing condition of potentiometer, measurement of EMF by potentiometer, Numerical.	1a. Calculate the EMF of the given cell using potentiometer. 1b. Calculate the voltage across various components of electric circuit. 1c. Calculate the value of the given resistance by Meter Bridge using the principle of Wheatstone's bridge. 1d. Explain working of a capacitor. Calculate the equivalent capacity and energy stored in the combination of capacitors	9	12

	1.4 Capacitance and capacitor, unit of capacitance, parallel plate capacitor, effect of dielectric on capacitance, combination of capacitors in series and parallel and energy stored in a capacitor, Numerical.			
2	**2. Magnetic effect of electric current** 2.1 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 magnetic field. 2.2 Force of a magnetic field on current carrying conductor, Fleming's left–hand rule, couple acting on a rectangular coil placed in the uniform magnetic field, Numerical. 2.3 Principle, construction and working of moving coil galvanometer. 2.4 Conversion of galvanometer into ammeter and expression for shunt resistance. Conversion of galvanometer into voltmeter and expression for series resistance, Numerical.	2a. Describe the concept of magnetic intensity and flux with relevant units. 2b. Explain magnetic effect of current carrying conductor. 2c. Describe the conversion of Galvanometer into Ammeter. Describe the conversion of Galvanometer into Voltmeter.	14	16
3	**3. Lasers and Fiber Optics** 3.1 Excitation of particle, optical pumping, types of transitions – non radiative and radiative. 3.2 Spontaneous and stimulated emission, population inversion, resonance cavity, active system, 3.3 Types of lasers, Ruby laser, Helium–Neon laser, and comparison between ruby and He–Ne lasers, Uses of lasers. 3.2 Reflection, refraction, laws of refraction, Total Internal Reflection (TIR). Principle, types, properties and applications of optical fibers.	3a. Describe the construction and working of three energy level laser system. 3b. Describe the phenomena of total internal reflection for the given mediums. 3c. Describe light propagation in the given type of optical fiber.	9	12

SUGGESTED PRACTICALS

The practical's in this section are psychomotor domain Pr Os (i.e sub-components of the COs), to be developed and assessed in the student to lead to the attainment of the competency Any 10 practical of Physics should be conducted during the Term.

Sr. No.	Practical Outcomes (PrOs)	Unit No.	Hours.
1	Verification of law of condensers in series.	I	2
2	Verification of law of condensers in parallel.	I	2
3	Measurement of EMF of cell by potentiometer.	I	2
4	Comparison of EMF of two cells by single cell method using potentiometer	I	2
5	Comparison of EMF of two cells by sum and difference method using potentiometer.	I	2
6	Measurement of internal resistance of a cell using potentiometer.	I	2
7	Measurement of unknown resistance using meter bridge.	I	2
8	Conversion of Galvanometer to Ammeter.	II	2
9	Conversion of Galvanometer to Voltmeter.	II	2
10	Use of magnetic compass to determine neutral point.	II	2
11	Measurement of divergence of light beam by laser.	III	2
12	Study the phenomenon of Total Internal Reflection and determine critical angle of incidence.	III	2
	Practical –assignments, student activities submission(Micro-project)		8

SUGGESTED SPECIFICATION TABLE WITH MARKS

UNIT NO	UNIT TITLE	Teaching Hours	DISTRIBUTION OF THEORY MARKS			
			R LEVEL	U LEVEL	A LEVEL	TOTAL MARKS
I	Current Electricity, Capacitors and Capacitance	9	3	5	4	12
II	Magnetic effect of electric current	14	5	5	6	16
III	Lasers and Fiber Optics	9	3	5	4	12
Total		32	11	15	14	40

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

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

SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related co-curricular activities which can be undertaken to accelerate the attainment of the various outcomes in this course:

1 . Market survey of different resins and compare the following points.
   i. Structure
   ii. Properties
   iii. Applications.
2. Library survey regarding engineering material used in different industries.
3. Power point presentation or animation for showing different types of LASER
4. Seminar on any relevant topic.

SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

1. Massive open online courses (MOOCs) may be used to teach various topics/sub topics.
2. Not only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
3. About 15-20% of the topics/sub-topics which is relatively simpler or descriptive in nature is to be given to the students for self-directed learning and assess the development of the LOs/COs through classroom presentations (see implementation guideline for details).
4. Teachers need to ensure to create opportunities and provisions for co-curricular activities.
5. Guide student(s) in undertaking micro-projects.

SUGGESTED MICRO-PROJECTS

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her in the beginning of the semester. She/he ought to submit it by the end of the semester to develop the industry oriented COs.

Each micro-project should encompass two or more COs which are in fact, an integration of practicals, cognitive domain and affective domain LOs. The micro-project could be industry application based, internet-based, workshop-based, laboratory based or field-based

i) **Optical Fiber and TIR**: Prepare models by using water and diode laser to demonstrate total internal reflection and the working of optical fiber .

ii) **Series and parallel resistances:** Prepare models for combination of series and parallel resistances using bulbs/ LED.

iii) **Systems and units:** Prepare chart on comparison of systems of units for different physical quantities.

iv) **Magnetic flux:** Prepare models to demonstrate magnetic lines of lines of forces of different types of magnets.

v) **Capacitors:** Prepare the models of various types of capacitors.

vi) **Current electricity:** Make one circuit with bulbs/ LED/ connected in parallel or series.

vii) **LASER**: Prepare the presentation on the industrial application of LASER.

viii) **Thermocouple**: Prepare chart showing different types of thermocouples with their characteristics used in electronic and electrical industry.

SUGGESTED LEARNING RESOURCES

A. BOOKS

SR. NO.	TITLE OF BOOK	AUTHOR	PUBLICATION
1	Physics Textbook XI (part1 &2)	J.V.Naralikar,A.W.Joshi	National Council of Education Research and Training New Delhi
2	Physics Textbook XII (part1 &2)	J.V.Naralikar,A.W.Joshi	National Council of Education Research and Training New Delhi
3	Fundamentals of Physics	D.Haliday & R. Resnick	Jhon Wiley and Sons , USA
4	Engineering Physics	R.K.Gaur, S.L.Gupta	Dhanpat Rai and Sons Publications.

B. Web site for references/ Video / PPT

1. www.physicsclassroom.com
2. www.hyperphysics.com

Mapping matrix of CO - PO's and PSO's:

Course Outcome	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1	1	1	1	2	1	3	1	1
CO2	3	1	1	1	1	2	1	3	1	1
CO3	3	1	1	1	1	2	1	3	1	1

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

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

COURSE : ENGLISH COURSE CODE: R18SC1707

COURSE CATEGORY : FOUNDATION CREDIT : 04

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:

Competency in English enhances the employability of an engineering professional. In today's competitive world English is important for students in their academics as well as in their prospective career. The students after passing Diploma in Engineering from any discipline, need to use English as a medium of communication in various formal as well as informal situations. They need to be proficient in the four skills of language i.e. listening, speaking, reading and writing. This curriculum is need based and is designed to help the students to communicate in English effectively.

Course Outcomes:

1. Formulate grammatically correct sentences.
2. Use relevant words as per context.
3. Comprehend given passages and dialogues.
4. Prepare speeches in given formal situations.
5. Distinguish between various types of communication
6. Communicate effectively by avoiding barriers in various formal and informal situations

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS	MARKS
1	**Applied Grammar** 1.1. Parts of Speech [Noun, Pronoun, Verb, Adverb, Adjective, Preposition, Conjunction, Interjection] 1.2. Tenses 1.3. Articles 1.4. Punctuation 1.5. Direct-indirect speech 1.6. Active and Passive voice	1a. List the various Parts of Speech 1b. Define different Parts of Speech 1c. Identify the part of speech of the given word 1d. Use appropriate prepositions to construct meaningful sentences. 1e. Use appropriate conjunctions to connect phrases and clauses in the given sentences. 1f. Use correct form of tenses in given situation. 1g. Use relevant articles in constructing sentences. 1h. Punctuate the given sentences by using correct punctuation marks. 1i. Change the narration for the given situation. 1j. Change the voice of a given sentence	08	12

2	**Vocabulary Building** 2.1 Synonyms and Antonyms. 2.2 Spellings 2.3 Words often confused 2.4 One word substitution 2.5 Engineering vocabulary	2a. Use synonyms and antonyms correctly. 2b. Correct the spelling errors in given sentences. 2c. Select appropriate word for the given context. 2d. Substitute given phrase/ sentence by one meaningful word. 2e. Apply the engineering vocabulary in the new /given context	08	16
3	**Reading Comprehension** 3.1 Comprehension based on dialogues 3.2 Comprehension based on unseen passage	3a. Answer the questions on a given unseen passage/ dialogue. 3b. Answer the questions orally on the given unseen passage with correct pronunciation	04	12
4	**Public Speaking** 4.1 Importance of public speaking 4.2 Characteristics of a good speech 4.3 Vote of thanks 4.4 Farewell speech 4.5 Introducing a guest	4a. State importance of public speaking 4b. State features of a good formal speech 4c. State characteristics of a good vote of thanks speech 4d. Write a vote of thanks speech for the given situation. 4e. State characteristics of a good farewell speech 4f. Write a farewell speech for the given situation. 4g. State characteristics of a good speech for introducing a guest 4h. Write a speech for introducing a guest in the given situation. 4i. Deliver a speech on a given situation	04	12
5	**Basics of Communication** 5.1 Definition 5.2 Need and importance of communication 5.3 Communication cycle and elements 5.4 Encoding and decoding 5.5 Types of communication 5.6 Verbal and non-verbal 5.7 Oral and written 5.8 Formal and informal 5.9 Difference between verbal and non-verbal, oral and written, formal and informal communication 5.10 Merits and demerits of oral and written communication	5a. Define communication 5b. State the importance of communication in business 5c. Enlist elements of communication 5d. Explain the various elements of communication. 5e. Identify the different communication elements in a given situation 5f. Draw a neat sketch of communication cycle for a given situation 5g. Explain encoding and decoding 5h. List types of communication 5i. Define verbal, non-verbal, oral, written, formal, informal communication 5j. Identify the type of communication in a given situation 5k. Distinguish between various types of communication	04	12

		5l. State merits and demerits of oral and written communication 5m. Communicate effectively in a given formal and informal situation.		
6	**Effective Communication** 6.1 Barriers in communication. • Mechanical • Physical • Psychological [Prejudice, status block, negative emotions like fear, ego, low confidence] • Linguistic • Cultural 6.2 Overcoming barriers 6.3 Principles of communication • Clarity • Conciseness • Correctness • Completeness • Feedback • Informality • Media selection • Flexibility	6a. Define "barrier in communication" 6b. List types of barriers in communication 6c. Explain mechanical, physical, psychological, linguistic, and cultural barriers with suitable examples 6d. Identify the communication barriers in a given situation 6e. Suggest remedies to overcome the given barriers. 6f. List principles of effective communication 6g. Describe the various principles of communication with suitable examples. 6h. Apply the various principles in oral and written communication	04	16

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Applied Grammar	08	03	03	06	12
2	Vocabulary Building	08	04	04	08	16
3	Comprehension	04	02	08	02	12
4	Speech Writing	04	02	02	08	12
5	Basics of Communication	04	04	04	04	12
6	Effective Communication	04	04	04	08	16
	Total	**32**	**19**	**25**	**36**	**80**

SUGGESTED EXERCISES/PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
1	V	Pronounce basic English words correctly.	02
2	V	Meet and greet people formally.	02
3	V	Talk about your family.	02
4	VI	Give directions about places in town.	02
5	VI	Describe your neighbourhood and region.	02
6	III	Answer the questions orally on the given unseen passage with correct pronunciation.	02
7	IV	Deliver any one of the following speeches: Vote of thanks, Farewell speech, Introducing a guest.	02
8	I	Rewrite the given sentences using correct articles.	02
9	I	Change the narration of given sentences from direct to indirect.	02
10	II	Solve the exercise based on vocabulary.	02
Total			**20**

SUGGESTED STUDENT ACTIVITIES

1. Group reading: Read one news item from a Standard English newspaper or magazine. Form a group of 4-5 students. Discuss the news from various angles (contents, grammar, and vocabulary) with your group.
2. Conduct quiz on spellings in small groups.

SPECIAL INSTRUCTIONAL STRATEGIES

1. Show video/animation, film to improve language skills
2. Use flash cards to demonstrate how to use flash cards to improve vocabulary.

SUGGESTED LEARNING RESOURCES

A) Books

SR. No.	Title of Book	Author	Publication (with year)
1	Applied Grammar and Composition	M.P. Bhatia	M.I. Publications (Eighth Revised Edition), Agra.
2	Advanced English Grammar and Composition	Alok Pandey and Deepak Pandey	Sahni Publication, Delhi-7.
3	Intermediate English Grammar	Raymond Murphy	Cambridge University Press, (Second Edition), New Delhi.
4	Essential English Grammar	Raymond Murphy	Cambridge University Press, New Delhi, ISBN: 9780-0-521-67580-9
5	Effective English with CD	Kumar, E. Suresh; Sreehari, P.; Savithri, J.	Pearson Education, Noida, New Delhi, 2009 *ISBN:* 978-81-317-3100-0
6	English Grammar at Glance	Gnanamurali, M.	S. Chand and Co. New Delhi, 2011 *ISBN*:9788121929042
7	Living English Structure	Allen, W.S.	Pearson Education, New Delhi, Fifth edition, 2009, *ISBN*:108131728498,99
8	English Reading Comprehension	R. Gupta	Ramesh Publishing House, New Delhi
9	The Art of Public Speaking	Dale Carnegie	Ocean Paperbacks

10	Essential Communication Skills	Shalini Aggrarwal	Ane Books Pvt Ltd
11	A Course in Communication Skills	Dutt, Rajeevan, Prakash	Foundation Books
12	Word Power Made Easy	Norman Lewis	Pocket Books / Goyal Publishers & Distributors
13	Words Often Confused	Dr. B. R. Kishore	New Light Publishers
14	Perfect Your Spelling Power	Raymond Hill	Maanu Graphics Publishers

B) Major Equipment/ Instrument with Broad Specifications

- Linguaphone language laboratory software

C) Software/Learning Websites

a. https://english.wifistudy.com/
b. https://www.britishcouncil.in/english/learn-online
c. http://learnenglish.britishcouncil.org/en/content
d. http://www.talkenglish.com/
e. www.languagelabsystem.com
f. www.wordsworthelt.com
g. www.learn4good.com
h. www.fluentzy.com
i. www.edufind.com
j. www.khake.com
k. www.learnenglish.org.uk
l. www.english4engineer.com
m. www.owl.english.purdue.edu

Mapping matrix of CO-PO's and PSO's

Course Outcome	Program Outcome									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	2					2	2			2
CO2	2					2	2			2
CO3	2					2	2			2
CO4	2					2	2			2
CO5	2					2	2			2
CO6	2					2	2			2

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

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

COURSE : BUSINESS COMMUNICATION COURSE CODE: R18SC1708

COURSE CATEGORY : FOUNDATION CREDIT : 03

Teaching and Examination Scheme:

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

Rationale:

Communication is life blood of any business. To be able to communicate effectively is considered one of the foremost employability skills. Fluency and correct pronunciation makes a world of difference in any business situation like meetings, conferences, seminars, presentations etc. Along with that, a business professional has to be proficient in written communication. Hence in this curriculum, speaking and writing skills are emphasized to help the students in interviews, presentations, and other oral as well as written communication situations.

Course Outcomes:

1. Give presentation using ICT.
2. Face a mock interview.
3. Write business letters for given formal situations
4. Draft notice, memorandum, and circular in given formal situations.
5. Draft reports on given formal situations.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS	MARKS
1	**Presentation Skills** 1.1 Need and importance 1.2 Effective presentation – guidelines for effective presentation 1.3 Use of positive Body language for effective presentation 1.4 Guidelines to prepare an effective Power Point Presentation	1a. Use different types of verbal and non–verbal communication during a presentation.	02	--
2	**Interview Techniques** 2.1 Preparation stage: Preparing for an	2a. Face a mock interview using appropriate	02	--

	interview, pre-interview research. 2.2 Factors affecting performance during the interview: stress, self-awareness, presence of mind. 2.3 Post-interview follow-up	communication skills		
3	**Business Correspondence-Part-I** 3.1 Letter of Enquiry 3.2 Letter of Order 3.3 Letter of Complaint	3a. Draft formal business letters in given situations	04	--
4	**Business Correspondence-Part II** 4.1 Letter of Job Application 4.2 Letter of Resignation 4.3 Joining letter 4.4 Leave application	4a. Draft formal letters related to employment in given situations.	04	--
5	**Office Drafting** 5.1 Notice 5.2 Circular 5.3 Memo 5.4 Email writing	5a. Draft notice, memo, circular in given situations	02	--
6	**Report Writing** 6.1 Visit report 6.2 Accident report 6.3 Progress report	6a. Draft Visit, accident, and progress report in given situations	02	--

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Not applicable

SUGGESTED EXERCISES/PRACTICALS

SR. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Approx. Hrs. Required
1	II	Face a mock Interview	04
2	I	Talk about different jobs and types of work	02
3	I	Talk about your hobbies and enquire about those of other people	02
4	I	Enquire about people's programmes, plans and booking facilities	02
5	IV	Draft a letter of Job Application with resume	02
6	III	Draft a request letter for everyday institute activities	02
7	V	Draft a Circular/ Notice on a given situation	02
8	VI	Email a Visit Report/ Accident Report to given email addresses.	02
9	I	Preparation of PPT /report on micro-project	04
10	I	Presentations on micro-project using ICT	06
Total			**28**

SUGGESTED STUDENT ACTIVITIES

1. Summarize the contents of a famous book/books.[fiction/nonfiction]
2. Write a report on various formal events in your college.
3. Identify a good business leader, study his presentations and prepare a report on it..

SPECIAL INSTRUCTIONAL STRATEGIES

1. Show video/animation, film to improve business communication

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication
1	Communication Skills	MSBTE	MSBTE, Mumbai
2	Effective Communication Skills	M Ashraf Rizvi	Tata McGraw-Hill
3	Communication Skills	Sanjay Kumar and Pushp Lata	Oxford University Press
4	Personality Development and Soft Skills	Barun K. Mitra	Oxford University Press
5	Kumar's Group Discussions and Interviews	Dr. B. R. Kishore , D. S. Paul	Vee Kumar Publications Private Limited,New Delhi-110008.
6	PowerPoint Presentations that Sell	Adam B. Cooper	McGraw Hill Professionals.
7	Business Communication	R. C. Bhatia	Ane Books India,New Delhi.
8	Developing Communication Skills	Krishna Mohan, Meera Banerji	Macmillan India Ltd., New Delhi.
9	300+ Successful Business Letters For Associates	Alan Bond and Nancy Schuman	BARON'S
10	The McGraw Hill Handbook of More Business Letters		McGraw Hill

B) Major Equipment/ Instrument with Broad Specifications

Linguaphone language laboratory software

C) Software/Learning Websites

a. British council – LearnEnglish website – http://learnenglish.britishcouncil.org/en/
b. British council – LearnEnglish website – fun and games – http://learnenglish.britishcouncil.org/en/study-break
c. British council – LearnEnglish website – business and work – http://learnenglish.britishcouncil.org/en/business-and-work
d. http://www.talkenglish.com
e. www.wordsworthelt.com
f. www.notesdesk.com
g. http://totalcommunicator.com/
h. www.speaking-tips.com
i. www.skillstudio.co.uk
j. www.mindtools.com
k. www.storynory.com

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1						2	2			
CO2						2	2			
CO3						2	2			
CO4						2	2			
CO5						2	2			

DIPLOMA PROGRAMME: ELECT. /COMP. ENGINEERING

COURSE: ENGINEERING GRAPHIC SKILLS **COURSE CODE: R18ME1210**

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.

Course Outcomes:

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
5. Draw different drawings AUTOCAD 2009 or higher version

Course Details:

UNIT	NAME OF THE TOPIC	Learning Outcomes	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	Draw the given geometrical shape As per specified dimensions	7

	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.		
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 specified method- Ellipse – Directrix focus method, arcs of circle method and concentric circle method. Paraboln – directrix focus method and rectangle method. Involute – of a polygon, of a circle and of combination of a polygon and circle.	Draw various curves using different methods	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.	Convert pictorial views into orthographic projections	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.	Convert pictorial views into sectional orthographic projections	4
5	5.1 **Isometric Projections and Views:** Construction and use of isometric scale. Conversion of simple orthographic views into isometric projections / views.	use of isometric scale	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.	Draw Freehand Sketches	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

Practical be done manually as well as using Auto CAD

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.

2. **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.

3. **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.

4. **Computer Aided Drafting:**

Open a new/existing file, Set/edit various Components of AutoCAD software, parameters in a window: Title bar, standard tool bar, menu, new/given file. bar, object properties tool bar, draw tool, bar, modify toolbar, cursor cross hair. Command window, status bar, drawing area, UCS icon.
File features: New file, Saving the file, Opening an existing drawing file, Creating Templates, Quit.
Setting up new drawing: Units, Limits, Grid, Snap. Undoing and Redoing action

5. Draw basic 2D entities like Line, Circle, Arc, Polygon, Ellipse, Rectangle, Multiline, Prepare 2D drawing of Poly Line.
Methods of Specifying points: Absolute components using coordinates, Relative Cartesian and Polar coordinates.
Dimensioning: Linear, Horizontal, Vertical, Aligned, Rotated, Baseline, Continuous, Diameter, Radius, Angular Dimensions.
Dim scale variable. Editing dimensions.

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 Publicatons, Mumbai
4	N.Y. Prabhu	Geometrical Engineering Drawing	Pune Vidyrthi Griha, Publications, Pune.
5	Ozarkar & Utturkar	Engineering Drawing	Maharashtra Publishing house
6	K. Venugopal	Engineering Drawing	New Age International Ltd., Delhi

MAPPING MATRIX OF CO-PO'S AND PSO'S:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	1	1	1						
CO2	1	1	1	1						
CO3	1	1	1	1						
CO4	1	1	1	1						
CO5	2	2	2	2						

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: COMPUTER FUNDAMENTALS **COURSE CODE: R18CP1401**

COURSE CATEGORY: FOUNDATION **CREDIT: 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

Course Outcomes:

The students will be able to

1. Understand the working, functions of computer systems and number system.
2. Know different types of Peripheral Devices
3. Know different types of Storage devices.
4. Know different types of Operating systems and programming languages.
5. Use various DOS commands and MS-office for creating various types of documents.
6. Understand the Concept of Computer Networks and Use Internet for e-mail and browsing.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOMES	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.a Understand the concept of computer, its advantages and disadvantages. 1.b Describe different types of computers. 1.c Understand	8	12

	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.	the number system		
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, Non Impact Printers- Ink jet, Laser. Plotters – Drum, Flat-bed, Inkjet. Projectors.	2.a Understand and describe the different types of input devices. 2.b Understand and describe the different types of output devices.	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.	3.a Understand and describe the working of different storage devices.	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,	4.a Understand the different types of computer software. 4.b Describe the functions of operating system. 4.c Describe different programming languages.	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, chkdsk, and help. **5.2 Exposure to Windows OS:** 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 .	5.a Understand and run the MS-DOS commands. 5.b Understand the components of Windows O.S	8	12
6	**6.1 Computer Networks :** Introduction, Applications of Network. Classification– Geographical Area (LAN, WAN, MAN, Internet, Intranet), Use of computer nodes (Client Server Networks, Peer-to-peer Networks). Network Topologies – Introduction, Types- hierarchical, bus, star, ring, mesh, and hybrid. **6.2 Internet and World Wide Web :** Introduction, Evolution of internet, Applications of Internet. Basic Internet Terms: Webpage, Website, Home Page, Browser, URL, Hypertext, Internet service provider, Web server. World Wide Web, Search engine and refining the search, Electronic Mail (E-mail) and its advantages and disadvantages.	6.a Understand the concept of computer networks, types and network topologies. 6.b Understand the concept of internet, URL, WWW and Email.	7	12

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1.	Introduction to Computers and Number Systems	8	4	8	4	16
2.	Input and Output Devices	8	4	8	-	12
3.	Memory and Storage Systems	8	4	8	-	12
4.	Computer Software and Programming Languages	8	8	8	-	16
5.	MS-DOS and Windows OS	8	4	4	4	12
6.	Computer Networks, Internet and WWW	8	4	8	-	12
	Total	**48**	24	40	16	**80**

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

SUGGESTED EXERCISES / PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1.	5	Illustration of windows components – My Computer, My Documents, Recycle Bin.	4
2.	5	Use of Windows – Creation/deletion of files, folders, icons and creating shortcut on desktop.	4
3.	5	Working with Control Panel settings (Display setting, Mouse, Printer, User Account).	4
4.	5	Use of the Windows accessories - Paint, Calculator, Clock.	4
5.	5	Use of the Windows accessories ---Notepad, WordPad.	4
6.	5	Paragraph formatting, Bullet and numbering, in MS-Word.	2
7.	5	Insertion of Clipart, auto shapes and word art in MS-Word.	4
8.	5	Editing header and footer and Insertion and deletion of table, rows and columns using MS-Word.	2
9.	5	Editing Text, spell check and autocorrect feature, page setup and Print feature using MS-Word.	2
10.	5	Insertion of bookmark and hyperlink in MS-Word.	2
11.	5	Creating and deletion of slides and slide show, Giving various transition effects and animation effects using Power Point.	4
12.	5	Custom Animation and rehearse timing using Power Point.	2
13.	5	Creating, manipulating & changing the chart type.	4
14.	5	Insertion, deletion and editing information in spreadsheet and insertion, deletion and naming a worksheet.	4
15.	5	Formatting cell and table, Study of Formulas, functions and named ranges.	4
16.	5	Data Sort and validation in MS-Excel.	4
17.	5	Introduction to DOS and use of internal DOS commands.	4
18.	5	Use of external DOS commands.	4
19.	6	Study of Web Browser. Creating email account, sending and receiving mail.	2
		Total	**64**

SUGGESTED STUDENT ACTIVITIES

Following is the list of proposed student activities like

1. Study working of different types of operating systems.
2. Installation of Windows and MS-Office.

SUGGESTED LEARNING RESOURCES

A) Books

SR. NO.	AUTHOR	TITLE	PUBLISHER
1.	# E.BALGURUSAMY	Fundamental of Computer	McGrawHill, 1st 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, 4th Edition, 2004
5.	D.Ravichandran, A.B.Patil	Computer Fundamentals	TMH pub.
6.	P.K.SINHA	Computer Fundamentals	BPB *Publication*
7.	Richard Allen King	The MS DOS Handbook	BPB *Publication, 2nd Edition*

B) Major Equipment/ Instrument with Broad Specifications

- Desktop Computers and LCD Projector.
- MS-Office 2007 onwards.

C) Software/Learning/ Simulations Websites

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

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	2				2		
CO2	2	2	2	3				3		
CO3	1		2	1				2		
CO4	2	2	3	2			2		3	
CO5	1	2	1	2						
CO6	2	1	2	1				2		2

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: ELECTRONIC DEVICES AND COMPONENTS COURSE CODE: R18EX1415

COURSE CATEGORY: FOUNDATION CREDIT: 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:

We use many Electronic equipment in our day to day life. Basic electronics is one of the subjects which are 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.

Course Outcomes:

The students will be able to

1. Understand construction, types and use of various electronic components.
2. Draw the characteristics of diode and basic circuits of rectifier, filter, and regulator.
3. Draw and describe the characteristics of transistor, understand working of amplifiers.
4. Understand types and working of oscillators.
5. Understand various parameters and applications of operational amplifiers.
6. Use various electronic instruments for measurement of electrical signals.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	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-	**Understand the concept of basic electronic components**	12	16

	Basic concept, Symbol, Types and construction of- Fixed: paper, ceramic, electrolyte, mica Variable: trimmer Voltage rating of capacitor 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.	**Understand the working and applications of different diodes**	10	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.	**Understand Transistors and amplifiers. Understand the difference between FET and BJT**	12	12
4	**Oscillator :** Need of an oscillator, classification as LC, RC & crystal oscillators, tuned LC circuit,	**Understand the need of oscillator and different types of oscillator**	12	16

	Barkhausen's criteria of oscillation LC oscillators: Circuit diagram and operation of Hartely, Colpit 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.			
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.	**Understand Operational amplifiers along with parameters and applications**	10	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.	**Use of instrument for measurement of electrical signal**	8	12

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Introduction to Components	12	6	6	4	16
2	Diode	10	6	6	-	12
3	Transistors And Amplifiers	12	4	4	4	12
4	Oscillator	12	6	6	4	16
5	Operational Amplifiers	10	4	4	4	12
6	Instruments	8	4	6	2	12
	Total	64				80

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

SUGGESTED EXERCISES/PRACTICALS

SR.NO.	UNIT	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1	1	Use of analog & digital Multimeter for resistance & voltage measurements	2
2	1	Study of resistors, capacitors, inductors - Symbols of different types, checking on multimeter.	2
3	2	V-I Characteristics of Diode.	2
4	2	V-I Characteristics of Zener diode.	2
5	2	Half wave, full wave rectifier with capacitor filter.	2
6	2	Bridge rectifier with capacitor filter.	2
7	2	Zener regulator.	2
8	2	IC 7805 regulator.	2
9	3	Output & transfer characteristics of transistor - CE configuration.	2
10	3	Characteristics of CE amplifier – Voltage gain calculation.	2
11	3	Characteristics of FET.	2
12	4	Astable Multivibrator using IC 555	2
13	6	Study of Signal Generator- block diagram & front panel controls.	2
14	6	Use of CRO for measurement of voltage & frequency of various signals of signal generator	2
		Total	

SPECIAL INSTRUCTIONAL STRATEGIES (if any)

i. Arrange a visit to nearby small scale manufacturing unit and make a report of tools and equipments used.
ii. Give Mini projects to students.

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication (with year)
1	Electronic Devices & Circuits	David Bell	OXFORD, 5th Ed, 2009
2	Basic Electronic & Linear Circuits	N. N. Bhargava	TMH, 24th Reprint, 1997
3	Electronic Devices & Circuits	Allen Mottorshead	Reprint, PHI, 2004
4	Electronic Measurement & Instrument	A. K. Sawani	17th Ed, Dhanpat Rai Pub, 2004
5	Electronic Devices & Circuits	Jocob Millman & C. Halkias	McGraw Hill, 2nd Reprint,
6	Electronic Components & Materials	Madhuri Joshi	1st Ed, 1989
7	Electronic Materials Components & Devices Technology	Anasuya Kalavar	Everest Pub House, 6TH Ed, 2000
8	Electronic Devices & Circuits	R. L. Boylestad, L. Nashelsky	PHI, 8th Ed, 2004

Mapping matrix of CO-PO's and PSO's:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1			**3**					**2**		**2**
CO2	**2**	**2**	**3**	**1**				**2**		**2**
CO3	**2**	**1**	**3**	**1**				**2**		**2**
CO4	**1**		**3**	**1**				**2**		**1**
CO5	**1**	**2**								**1**
CO6	**2**	**1**	**3**	**3**				**2**		**2**

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER / MECHANICAL ENGINEERING

COURSE: INDUSTRIAL ORGANIZATION AND MANAGEMENT **COURSE CODE: R18ME2203**

COURSE CATEGORY: ALLIED **CREDIT: 03**

Teaching and Examination Scheme:

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

Rationale:

Engineer has to work in Industry with man and machines and material as resources. Therefore, managerial skills and abilities are essential for enhancing their employability and career growth. This course is therefore designed to provide the basic concepts in business organization & management. This course is classified under human sciences and is intended to teach students about structure of organization and its management, types of organization, principles of management and process, Management and functioning of various departments, Industrial safety & Industrial Acts.

Course Outcomes:

1. Overview of business and understand business organization and management processes.
2. Know types of business organization structures, organizational principles, departmentation and types of ownerships.
3. Identify different human resources and its management. Know different acts, wages, and incentives, safety measures for execution in Industry.
4. Understand financial resources and its management.
5. Identify different sources of material and its storage management.
6. Understand marketing management & use project management techniques.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS	MARKS
1	**Business Organization & Management Processes** **1.1 Types of business:** **1.2** Service industry, manufacturing industry, trading industry. **1.3 Industrial sectors:** Types and features of- engineering industry, process industry, textile, chemical, agriculture, information technology, banking, insurance, retail, hospitality, automobiles, paper, cement ,petro	1. Lists different business trends of Industry. 2. Explain characteristics, nature of each business with suitable example. 3. Explain various industrial sectors with its product nature. 4. Describe nature of smart manufacturing as emerging trends in business Industry.	07	12

	chemical, sugar, steel and healthcare etc. **1.4 Emerging trends in business:** Industry 4.0 revolution and Smart Manufacturing, globalization and its effect. **1.5 Management:** Concept, definitions, levels, administrator & management, scientificmanagement. **1.6 Principles of management**: 14 principles of Henry Fayol. **1.7 Functions of management:**Planning, organizing, staffing, directing and controlling.	5. Justify globalization and its effect on Indian market. 6. Define the Management term and list different level of management. 7. Explain role of the different level of management. 8. Differentiate between management & administration. 9. Compare between conventional and scientific management. 10. Enlist and describe Henry Fayol 14 principles of management. 11. State and explain functions of management with suitable example.		
2	**OrganizationalManagement** **2.1 Organization:** Definition, steps in organization formation . **2.2 Types of organization structure:**Line, staff, line and staff. **2.3 Departmentation:** Formed by product, by functions & by process. **2.4 Principles of organization:** Authority and responsibility, centralization and decentralization of authority, span of control, balance, stability and flexibility, communication. **2.5 Forms of ownership:** Proprietorship, partnership, Joint stock (private Ltd, public Ltd), co-operative society, Government sector- Govt.dept, public corporation, public company.	1. Define the term organization. 2. Explain the steps in organization formations. 3. Describe different types of organization with respect to its nature, characteristics etc. 4. Differentiate between line & staff types of organization. 5. Explain the concept of departmentation. 6. State and explain different types of departments. 7. Describe various principles of organization with suitable example. 8. Classify different forms of ownership with diagram. 9. Explain different forms of ownerships with respect to its nature, characteristics, 10. Advantages, limitations.	**07**	**12**
3	**Human Resource and Management** **3.1. Personnel management:**Definition, functions, man power planning, source of employment, recruitment & selection procedure, employee testing methods, training methods, qualities and duties of supervisor. Morale-advantages, methods to improve morale. Motivations-definition and need, types. **3.2. Wages:** Definition, types,	1. Define the personnel management. 2. State the functions of personnel management in organization. 3. Describe men power planning for different department. 4. Write different source of employment. 5. Explain recruitment and selection procedure for	**10**	**16**

	characteristics of good wages, wage payment plan & types. **3.3. Incentives:** Definition, types, incentive plans. **3.4. Legislative Acts:** Needs, factory act, employee compensation act, industrial dispute act, minimum wages acts. **3.5. Industrial accidents& safety:** Causes of accidents, types, effects of accidents, preventive measures, safety procedure &programme.	employee. 6. State and describe various testing & training methods of employee. 7. Justify qualities and duties of supervisor. 8. Write advantages of morale. 9. State methods for improvement of morale. 10. Explain various types of motivations. 11. Describe characteristics of good wage plan and its types. 12. Write various types of incentive plans. 13. Explain various industrial acts. 14. Write causes, effect, types of industrial accidents. 15. Explain preventive measure, safety procedure &programme.		
4	**Financial Management** **4.1. Financial Management:** Definition, objectives, functions. **4.2. Capital Generation:**Types of capital, sources of raising capital. **4.3. Budgets:**Types of budgets- production, sales, cash, labour, material and financial budget. **4.4. Accounts:** Types of account- profit& loss account, balance sheet, financial ratios.Terminology –Book keeping & accounting, journal, ledger, liability and assets etc. **4.5. Taxes:** Types of taxes, meaning and example of excise, service tax, income tax, value added tax, custom duty, goods service tax (GST).	1. Define term 'Financial management. 2. State and explain objectives and functions of financial management. 3. Differentiate between fixed capital and working capitals. 4. State and explain various source of raising the finance. 5. Describe different types of budgets. 6. Enlist various types of accounts with example. 7. Justify profit &loss accounts with sample balance sheet. 8. State and explain various financial ratios and its purposes in company. 9. Explain the terminology used in account. 10.Classify the various taxes, explain the meaning of each taxes used in business.	**10**	**16**

5	**MaterialManagement** **5.1. Inventory Management:** Inventory-concept, classification, functions, objectives of inventory managements. **5.2. ABC analysis:** Concept and necessity, graphical representation, advantages and limitations. **5.3. Economic order quantity:** Concept EOQ, graphical representation, determination of EOQ, buffer stock, advantages and limitations, numerical. **5.4. Purchasing:** Objectives, functions of purchase department, purchasing procedure. **5.5. Industry4.0 Techniques of Material Management:** Technology used in Smart Manufacturing(SM) for material management – material resource planning (MRP) module ,enterprise resource planning (ERP)module, internet of thing (IoT) and digital transformations (DT),and its advantages.	1. Explain the concept inventory. 2. Classify and state various functions of inventory. 3. List various objectives of inventory management. 4. Describe concept and need of ABC analysis. 5. Show the graphical representation of ABC analysis. 6. Write advantages and limitations of ABC analysis. 7. Explain concept of EOQ with graphical representation. 8. Define buffer stock. 9. State advantages and limitations of EOQ. 10. Solve simple numerical based on EOQ calculation. 11. Describe objectives & functions along with purchasing procedure. 12. State and explain Industry 4.0 techniques of material management. 13. Justify use of internet of things (IoT) & digital transformation (DT) with its advantages.	**07**	**12**
6	**Sales/Marketing Management& Project Management** **6.1. Sales Management:** Sales-definition, functions &duties of sales managers. **6.2. Marketing Management:** Marketing-definition, functions. Marketing management-definition and functions. Market research-definition, objectives and scope. Market- concept, types. **6.3. Advertising**: Definition, agency and types. **6.4. Project Management:** Network analysis- Definition, list of network analysis technique, objectives and advantages. Terminology in network analysis-events, activity, path, network diagram, critical path, duration, dummy activity, construction of network diagram for	1. Define sales; also write functions & duties of sales managers. 2. Define marketing. State the functions of marketing. 3. Define marketing management. State the functions of marketing management. 4. Define market research. State its objectives and scope. 5. List & explain various types of markets. 6. Define advertising; also state its agency and types. 7. Define network analysis &and its various techniques. 8. Write objective and advantages of network analysis. 9. Explain various terminology used in	**07**	**12**

	project. **6.5. CPM:** Concept, characteristic, applications and simple numerical. **6.6. PERT:** Concept, characteristics, applications, simple numerical on PERT.	network analysis. 10. Draw network diagram and show events, activity, critical path, duration, dummy activity. 11. Explain concept of CPM. State its important characteristics and applications. Solve numerical on CPM. 12.Explain concept of PERT. State its important characteristics and applications. Solve numerical on PERT. Compare CPM and PERT.		
		TOTAL	**48**	**80**

Specification table for question paper design:

Unit No.	Unit Title	Teaching Hours	Distribution of Marks			
			R Level	U Level	A Level	Total
1	Business Organization &Management Processes	07	4	4	4	12
2	Organizational Management	07	4	4	4	12
3	Human Resource and Management	10	4	8	4	16
4	Financial Management	10	4	8	4	16
5	Material Management	07	4	4	4	12
6	Sales/ Marketing Management &Project Management	07	4	4	4	12
	TOTAL	**48**	**24**	**32**	**24**	**80**

Teaching Methodology:

Chalk Board, Discussions, Power Point Presentations, Videos, Visits, Charts.

i) Intellectual Skills:

- Understand functions and managerial skills required for various departments.
- Understand the principles of management and role of management in organization.
- Apply different project management techniques in industry.

Suggested Learning Resources:

Reference Books:

SR.NO.	AUTHOR	TITLE	PUBLISHER
1	Dr. O.P. Khanna	Industrial Engineering & Management.	Dhanpat Rai &Sons.
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.

Mapping Matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	1	1			1	2	2		2	2
CO2	1	1			1	2	3		2	2
CO3	1				1	2	3	1	1	1
CO4	2				1	2	3	1	1	1
CO5	2	1			1	2	3	1	1	1
CO6	1	2			1	3	3	2	2	2

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: ELECTRICAL ENGINEERING **COURSE CODE: R18EE2310**

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	-	-	50	150

Rationale:

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

Course Outcomes:

The students will be able to elaborate

1. Facts, concepts & principles of AC and DC.
2. Constructional features, working, applications of single phase and three phase AC Circuits.
3. Constructional features, working, applications of transformers.
4. Constructional features, working, applications of DC machines.
5. Constructional features, working, applications of AC motors
6. Use of various equipments for computer laboratory.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
1.	1.1 D.C. Circuits And Basic Terms : Revision of basic terms, series and parallel circuits, resistance, specific resistance and temperature co-efficient of resistance (No numerical).Kirchhoff's current law, Kirchhoff's voltage law. Application of Kirchhoff's laws for simple network solutions. Simple numerical. 1.2A.C. Fundamentals: Generation of alternating voltage and current i.e. principle, construction and working of elementary alternator. Graphical representation of e.m.f. and current. Equation of A.C., E.M.F. Definitions : instantaneous value, cycle, period, frequency, amplitude and Values of alternating voltage and current: peak value, average value, r.m.s. value. Definition of peak factor and form factor. (No derivation) 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- a) Purely resistive circuits. b) Purely inductive a.c. circuits. c) Purely capacitive circuits. Concepts of Inductive reactance, Capacitive reactance.	7	12
2	2.1A. C. Series Circuits : R-L circuit:Phasor diagram, Impedance, Impedance triangle, Power equation. R-Ccircuit: Phasor diagram, Impedance, Impedance triangle, Power equation. R-L-C series circuit:Phasor diagram, Impedance, Impedance triangle, Power equation, Phase relationship between voltage and current. Series resonance. Definition of Apparent Power, Reactive Power, True Power, Power Factor. 2.2Three Phase Circuit: Introduction to three phasesupply systems. Advantages of polyphase circuits over single phase. Process of generation of three phase voltage. Introduction to star and delta connection and their applications. Voltage, current & power relations of star and delta connected balanced system and simple numerical.	10	16

3.	3.1 Single Phase Transformer: Definition of transformers. Principle of operation. Constructional details. Types of transformers. Concept of ideal transformer. E.M.F. equation ,Voltage, Current ratio of a transformer. Concept of practical transformer on- load. Phasor diagram of transformer at No-load and on-load at lag, lead and unity 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.	8	12
4	4.1D.C. Machines: Introduction, Constructional features and working of d.c. generator and specifications, E.M.F. equation of a d.c. generator &simple numerical on emf equation. Types of d. c. motors. Working principle & torque equation d.c. motor and specifications, simple numerical on torque calculation. Characteristics and applications of d.c. motors, reversal of direction of rotation of motor. Necessity, construction and working of 3 point and 4 point starters for d. c. shunt motor. Methods of Speed Control of d. c. shunt motor.	7	12
5	5.1 A. C. **Motors :** 5.1.1 Induction motors -Constructional details and specifications. 5.1.2 Working of three phase induction motor. Method to change the direction of rotation of three phase induction motor. Starters. 5.1.3 Applications of squirrel cage & slip ring induction motors. General load characteristic of three phase induction motor. Comparison between squirrel cage & slip ring induction motor. Basics of construction, workingand applications of Synchronous machines. 5.2 Characteristics, specifications and applications of following special motors- a) Universal motor/A.C. series motor. b) Linear induction motor. c) DC Servo motor. d) AC servo motor e) BLDC 5.3Stepper motor: Construction of variable reluctance. Permanent magnet and hybrid type of stepper motor. Characteristics of stepper motor, Applications of stepper motors. Basics ofspeed control of stepper motors.	10	16

6	6.1 Special Equipment: 6.1.1 Basics of UPS, SMPS and Voltage Stabilizers: Principle of operation, block diagram & working, Types, advantages &demerits. 6.1.2 Spike suppresser: Reasons for supply spikes, effect of spike on PC, principle, construction & working of spike suppresser. 6.2 Earthing and other Protective Devices: a) Earthing :need of earthing for electrical installation, types of earthing with simple sketches. b) MCB: general construction & operation, advantages of MCB over fuse. c) ELCB: need of ELCB, general construction & operation. d) Fuse: Need and types	6	12

Teaching methodology: Chalk board, discussion, charts, and PPT.

A) Term Work:

Skills to be developed:

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.

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. Voltage, current and power calculations with lamp load for series & parallel circuit combinations with AC supply.
2. Voltage, current, 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-
    i. Armature control method.
    ii. Field control method.
8. Study of a single phase induction motor (starting & reversing).
9. Study of types of three phase Induction Motor and starters used for squirrel cage & slip ring induction motors.
10. Study of types of stepper motor.
11. Study of AC and DC servo motor and BLDC motors with their applications.
12. Study of types of UPS and Voltage Stabilizers.

Learning Resources:

A) Books:

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

#: Text Book

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	2	2	1	2			
CO2	2	1	2	1	2	2	1			
CO3	1	1	1	2	1	1	1			
CO4	2	2	2	1			2			
CO5	2	1	1		1		1			
CO6	2	2	2	2	2	2	|2			

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE -1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE : WORKSHOP PRACTICE **COURSE CODE: R18ME2210**

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.

Course Outcomes:

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 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	Learning Outcomes
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	Use appropriate tools and equipment for For given job
2	2.1 **Electrical Workshop:** **Cables:** Co-axial, twisted pair, ribbon, UTP, fiber optic **Connectors:**	Test various electrical components and PC related accessories. Select and use appropriate components for

	BNC, male/female D type, flat cable connector, RJ-45 **Switches:** Toggle- SPST, SPDT, DPST, DPDT Thumb wheel, rotary, push button, DIP Keyboard switches- Mechanical, Capacitive, Membrane **Relays:** General-purpose relay, Types & uses **Wiring accessories:** Electric Tester, wire strippers, Switches, sockets, holders, plug pins, indicating lamps, fuses, and insulation tapes. **Wiring systems:** PVC casing capping, conduit wiring Soldering: **Soldering material and techniques**PCB, Preparation of PCB for simple circuit **Transformers:**Types, construction, applications **Study of MCBPreparation of extension board**	appropriate wiring activity. Follow safety precautions while testing and using electrical appliances.

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 CNCmachine((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	AnasuyaKalavar	Electronic Materials Components & Devices Technology	6th Ed, 2000, Everest Pub. House,
2	HajaraChowdhari	Workshop Practice Vol 1	10TH Ed, 1995, Media Promoters & Pub

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	1	1	1						
CO2	1	1	2	2						

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: MARKETING MANAGEMENT **COURSE CODE: R18EE2302**

COURSE CATEGORY: ALLIED **CREDIT: 3**

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
01	02	-	-	-	-	@25	25	50

@: Internal Examination

Rationale:

An 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

Course Outcomes:

The student should be able to

1. State the principles of market research & analysis
2. Summarize the of marketing department& marketing network
3. State the aspects of international marketing.
4. Conduct a small market survey& write a report about the market survey conducted.
5. Use the various methods of Digital Marketing.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS
1.	**Introduction** Marketing Management, process & functions. Developing marketing strategies. Marketing environment	1 a Identify the functions & processes of marketing	01
2.	**Market Research & Sales forecasting** Need of market research, Methods of data collection, sales forecasting, consumer behaviour.	2.a Understanding the consumer requirement 2.b Interpretation of data that is collected.	03
3.	**Market Planning** Market positioning, market targeting, marketing strategy, product policy, branding, pricing & pricing strategy, Advertising, Case study	3.a Selection of suitable method of marketing by case study by surveying by considering these factors..	03
4.	**Sales management**	4.a Report writing about the	04

	International marketing- Setting objectives& deciding policies, development of sales force, sales organization Liberalization, need of International Marketing, process & Exim policy of Govt. of India.	market survey conducted	
5.	**Digital Marketing** Email -Marketing: Introduction, Using Email marketing Software, Building email list by quantity and quality, crafting email analysing and tracking email marketing strategy. Internet Marketing: Basic Search engine optimization and search engine optimization techniques. Affiliate marketing: Introduction, Setting of an affiliate program, Gaining affiliates, tracking and reporting of affiliates, Affiliate plans, becoming an affiliate.	5.a Select and elaborate various methods of Digital Marketing.	05

SUGGESTED EXERCISES/PRACTICALS

Sr. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1.	**1**	About My Self/ Marketing yourself.	**02**
2.	**1,2**	Preparation of Mind Map for any selected topic by the student.	**02**
3.	**3**	SWOT Analysis.	**02**
4.	**4**	Self /Personal evaluation.	**02**
5.	**1,2,3,4**	Team building Activity.	**02**
6.	**1,2,3,4,5**	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 & submit the report of above activities.	**14**
Total			**24**

SUGGESTED LEARNING RESOURCES

C) Books

Sr. No.	Title of Book	Author	Publication (with year)
1.	Marketing Management 11 th Edition	Kotler Philip	Pearson Education India
2.	A Handbook on Marketing Management	Dr. V.O. Vorkey	Everest Publishers, Pune
3.	Email, Internet , Affiliate Marketing	-	The internet Marketing Academy.

D) Software/Learning/ Simulations Websites

1. https://www.tutorialspoint.com/marketing_management/
2. https://www.studocu.com/en/document/university-of-connecticut/intro-to-marketing-management/lecture-notes/lecture-notes-complete-revision-introduction-to-marketing-management/686989/view
3. https://www.slideshare.net/
4. www.bookboon.com

Mapping matrix of CO-PO'S and PSO'S:

Course Outcome	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	1	2		3	2	3	3			
CO2	2		3		3	2	1			
CO3	1	3		2		1	2			
CO4	2	2	2		3	2	2			1
CO5	1	2		3	2	3	3			1

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: MECHANICAL/COMPUTER ENGINEERING

COURSE: ENTREPRENEURSHIP DEVELOPMENT **COURSE CODE: R18ME2208**

COURSE CATEGORY: ALLIED **CREDIT:03**

Teaching and Examination Scheme:

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

@ Internal Examination

Rationale:

This course 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 course includes case studies in the related field. The course emphasizes the development of enterprising qualities among young engineers.

Course Outcomes:

1. Identify various business opportunities.
2. Analyze selected business idea.
3. Prepare business plan for enterprise.
4. Generate awareness about enterprise management.

Course Details:

UNIT	NAME OF THE TOPIC (with Details)	LEARNING OUTCOME	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 Entrepreneur. **1.2Entrepreneurial Competencies: -** Characteristics of an entrepreneur, qualities	1. Explain entrepreneur, concept of entrepreneur and entrepreneurship. 2. State characteristics and qualities of entrepreneur. 3. Difference between Entrepreneur and Entrepreneur. 4. Explain Women entrepreneurship with examples. 5. Discuss causes of limited growth of Women entrepreneurship.	4

	of an entrepreneur, competencies of entrepreneur. **1.3Women Entrepreneur:** Definition, characteristics of women entrepreneur. Causes of limited growth in India, remedies for limited womenEntrepreneurship development.		
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 Gregory X-Y theory.	1. Explain concept of motivation and types of motivation. 2. Explain challenges of motivations. 3. Explain theories of motivations.	**2**
3	**3.1 Creativity and Innovation :** Definition and concept of Innovation, definition and concept of Creativity. Characteristics of creative people. Discussion of various examples withRespect to creativity and innovation.	1. Explain concept of Innovation and Creativity. 2. Discuss characteristics of creative people. 3. Discuss various examples of Innovation and Creativity.	**2**
4	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. 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. 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.	1. Discuss the Business Opportunities. 2. Describe classification of opportunities. 3. Explain search and generation of business idea. 4. Discuss Sources of Business Idea.	**3**
5	**5.1Government and Non-Government Agencies for Promotion andDevelopment: Importance** of funds, Types of funds. Various schemes of assistance ofGovernment, Government policies and incentives. Registration with variousGovernment agencies, definition of SSI and Ancillary.	1. Discuss Government and Non-Government Agencies associated withentrepreneurship. 2. State importance of funds and government fund schemes. 3. Explain SSI and Ancillary.	**2**

6	**6.1Business 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 No institutionalized sources of working capital, Funds flow statements, Loan application form for appraisal. Project report preparation.	1. Explain concept of Business Plan. 2. Explain project formulation and analysis. 3. State sources of capital. 4. Calculate cost of production. 5. Describe cost volume profit relationship. 6. Calculate cost of production. 7. Discuss loan application form for appraisal.	**3**

SUGGESTED EXERCISES/PRACTICALS:

Sr. No.	**Unit No.**	**Practical Exercises** (Outcomes' in Psychomotor Domain)	**Approx. Hrs. Required**
1.	I	Biography of any entrepreneur	02
2.	I	Self Disclosure Exercise (Who am I?)	02
3.	II	Self rating questionnaire.	02
4.	III	Thematic Appreciation Test (TAT)	02
5.	III	Ring Toss Exercise	04
6.	III	Tower Building Exercise	04
7.	II	Convince and Crown	02
8.	III	Creativity and Problem solving	02
Professional exercises			
9.	IV	Walking through Market	04
10.	V,VI	Business plan preparation	04
11.	I,V,VI	Interview of a successful entrepreneur	02
12.	I	Interview / Biography of a successful women entrepreneur	02
Total			**32**

MAJOR EQUIPMENT/INSTRUMENT REQUIRED:

Sr.No.	**Equipment Name With Broad Specifications**	**Exp.Sr.No.**
1.	LCD Projector	ALL
2.	Rings, Pegs, Line Marker	5
3.	Work Table	5,6
4.	Wooden Blocks, Sticks	6

SUGGESTED STUDENT ACTIVITIES:

TEACHING METHODOLOGY:
Chalk Board, Discussions, Power Point Presentations, Transparencies, Visits, Charts.

i) Intellectual Skills:

- Identify various opportunities in market.
- Identify individual's entrepreneurial competencies.
- Interpret risk to be taken during a task.
- Interpret SWOT of individual.
- Prepare a report of business plan.
- Enhance/Improve presentation and writing skills.

ii) Motor Skills:

- Presentation Skills
- Use of multi media

SUGGESTED LEARNING RESOURCES:

A) REFERENCE BOOKS:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1.	Vasant Desai	Dymanics 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	Entrepreneurial Development	Sultan Chand & Sons, 1993.
4.	D. D. Mali	Training of Entrepreneurship and Self Employment.	Mittal Publications, 1999.

Mapping matrix of CO-PO'S and PSO'S:

Course Outcome	**Program Outcome**									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
C01		3		1	2		1			2
C02	1	1	2	1	1		1			
C03	2	1		1	1		1			
C04		2			2					

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: APTITUDE SKILLS **COURSE CODE: R18SC1715**

COURSE CATEGORY: ALLIED **CREDIT: 3**

Teaching and Examination Scheme:

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

Rationale:

Aptitude is an important prerequisite for entering in industry. The aim of the course is to acquire some essential competencies in Aptitude 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.

Course Outcomes:

1. Find the missing terms and analogy of numbers and alphabets.
2. Interpret coding and hence doing decoding.
3. Solving arithmetic problems.
4. Solving puzzles.
5. Interpret given data and solving given problems.

Course Details:

UNIT	NAME OF THE TOPIC (with Details)	LEARNING OUTCOME	HOURS	MARKS
1	1.1 Series Completion: Number Series Alphabet Series Alpha-numeric Series 1.2 Analogy: Number Analogy Alphabet Analogy	1c. Apply the concept of arithmetic progression, geometric progression and other series of numbers to find missing terms. 1d. Apply the concept of alphabetic series of numbers and Alpha-numeric Series to find missing terms. 1e. Find analogy of given numbers and alphabets.	3	-
2	2.1 Letter to letter coding 2.2 Letter to number coding 2.3 Deciphering message word codes	2c. Analyze concept of coding and hence give code word for the given word. 2d. Investigate given simple word code and hence decode the given sentence.	2	

3	3.1 Blood Relations 3.2 Age 3.3 Directions 3.4 Calendar 3.5 Logical Venn diagram	3.6 Solve the given problem using concept of Blood Relations, Age, Directions, Calendar, Logical Venn diagram and logical thinking.	**3**	
4	4.1 Classification type questions 4.2 Comparison type questions	4b. Classify the given data for solving the given problem. 4c. Compare the given data for solving the given problem.	**2**	
5	5.1 Problems on trains 5.2 Time and distance 5.3 Height and distance 5.4 Permutation and combination	5d. Solve various arithmetic problems on speed and Permutation and combination.	**3**	
6	6.1 Table charts 6.2 Pie charts 6.3 Bar charts 6.4 Line Charts	6c. Interpret the result for various charts.	**3**	

SUGGESTED STUDENT ACTIVITIES

Other than the classroom learning, following are the suggested student-related ***co-curricular*** activities which can be undertaken to accelerate the attainment of the various outcomes in this course.

Students can appear for online tests and check their score on following web sites.

SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

1. Massive open online courses (***MOOCs***) may be used to teach various topics/sub topics.
2. ***'L' in item No. 4*** does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
3. About ***15-20% of the topics/sub-topics*** which is relatively simpler or descriptive in nature is to be given to the students for ***self-directed learning*** and assess the development of the LOs/COs through classroom presentations

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication (with year)
1	A MODERN APPROCH TO VERBLE AND NON-VERBLE REASONING	R. S. AGGARWAL	S. CHAND & COMPANY LTD.,2008 ISBN: 81-219-0551-6
2	TEST OF REASONING	EDGAR THORPE	TATA McGRAW-HILL'S, New Delhi, 2011ISBN-13 :978-0-07-062031-5
3	GMAT	NEHA KULKARNI	VIDYAVIKAS ACADEMY, 2017

B) Software/Learning/ Simulations Websites

www.indiabix.com
www.youth4work.com
www.easycalculation.com
www.math-magic.com

Mapping matrix of CO-PO'S and PSO'S:

Course Outcome	**Program Outcome**									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	3	1					1			
CO2	3	2	1				1			1
CO3	3	1					1			
CO4	3	1	1				1			1
CO5	3	2	1				1			1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: ENVIRONMENTAL STUDIES **COURSE CODE: R18CP2401**

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.

Course Outcomes:

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

Course Details:

UNIT	NAME OF THE TOPIC (with Details)	LEARNING OUTCOMES	HOURS
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	Understand importance of environment Know key issues about environment	4

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/Citizen	Know aspects about improvement methods Know initiatives taken by the world bodies to restrict and reduce degradation	8
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 3.2E-Waste Disposal	Know aspects about improvement methods Know initiatives taken by the world bodies to restrict and reduce degradation	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	Understands the reasons for environment degradation	10

SUGGESTED STUDENT ACTIVITIES

Any one Activity of the following.

A) Collect information and data to prepare PPTs and present it using multimedia.

B) 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

SUGGESTED LEARNING RESOURCES

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	AninditaBasak	# 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

Mapping Matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2									
CO2	2	1				1				
CO3	2	2				1				
CO4	2	2	2		2	1				

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: PROGRAMMING IN 'C' **COURSE CODE: R18CP3401**

COURSE CATEGORY: CORE **CREDIT : 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.

Course Outcomes:

1. Explain basic terminology used in C programming.
2. Write, compile and debug program in C language.
3. Use basic element like control statements, array and strings in program development.
4. Understand various storage classes of variables and develop programs using user defined functions.
5. Develop programs using pointers and dynamic memory allocation.
6. Explain the basic concept of file handling, testing and debugging.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS	MARKS
1	**Elements of C** 1.1 C Character set, keywords (Reserved words), Identifiers, Escape sequences, Constants, Data types, Variable declaration, Rules for naming of variables, type casting. 1.2 Operators: arithmetic, assignment, relational, logical, increment/decrement operators, conditional operator, precedence and associativity of operators. Expressions: arithmetic, relational and logical expressions, Comments, Symbolic constants. 1.3 Input-Output in C : 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.	1a. Understand the character set of C. 1b. Understand identifiers, keywords, data types, variables in C. 1c. Use of operators and Input-output functions in C.	8	12
2	**Control Statements** 2.1 Branching in 'C': If statement, if-else statement, nested if-else statement, if-else-if ladder statement, switch-case statement. 2.2 Looping in 'C': While statement, do-while statement, for statement, nesting of loops, nested for loop. 2.3 Continue, break statement and goto statement.	2a. Develop a program using branch control statements. 2b. Write a program using loop control statements.	10	16

		2c. Use continue, break and goto statements in C program.		
3	**Arrays and Strings** 3.1 Arrays in 'C': Concept of Array, Defining array, One Dimensional Array- Declaration of 1-D array, Initialization of array, accessing and processing 1-D array. Programs based on single dimensional arrays, Two Dimensional Array: Declaration, Initialization of 2-D array, accessing and processing of 2-D array, Simple programs based on 2-D array. 3.2 Character Strings: Specification and syntax, Declaration of String, Initialization of String, accepting string using scanf () and gets () functions, displaying string using printf() and puts() functions. 3.3 String Library Functions – strlen(), strcpy(), strncpy() strcat(), strncat(), strcmp(), stricmp(), strrev(), strupr(), strlwr(), Simple programs using string manipulation.	3a.Write a program using one- dimensional array. 3b. Write a program using two-dimensional array. 3c. Use various string library functions for string manipulation in c.	8	12
4	**Functions in C** 4.1 Functions Advantages of using functions, Library functions, main() function, User defined functions – function prototype, function definition, function call, function declaration, programs using call by value and call by reference. 4.2 Storage classes of variables: auto, static, register and extern. Life, scope. Concept of local, global and static variables and initial value of variables for each storage class. 4.3 Passing array to function, Passing string to function, recursive function.	4a. Write a program using user defined functions. 4b. Understand the concept of storage classes of variables. 4c. Develop a programs using recursive functions. 4d. Understand how to pass array and string to function as an argument.	10	16
5	**Pointers and dynamic memory allocation** 5.1 Introduction of Pointers, pointer arithmetic, pointer to pointer, passing parameter to function using pointer(pointer and functions) 5.2 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. 5.3 Pointer to function : Declaring a pointer to function, calling a function through function pointer, passing a function's address as an argument to other function, Array of pointers.	5a. Develop a programs for pointers arithmetic. 5b. Use of dynamic memory allocation functions in C. 5c. Develop a programs using Pointer to functions and array of pointers.	7	12
6	**File Handling** 6.1 File operations –opening, reading, writing & closing file. 6.2 Testing and Debugging: Definition, difference between Testing and Debugging, Types of program errors, Testing a program, Debugging a program for logic error and syntax errors.	Learn the basic file handling operations and Understand the difference between testing and debugging.	5	12

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Elements of 'C'	8	4	4	4	12
2	Control Statements	8	4	6	6	16
3	Arrays and Strings	10	2	2	8	12
4	Storage classes of variables and Functions	10	4	6	6	16
5	Pointers and dynamic memory allocation	7	2	6	4	12
6	File Handling , Testing and Debugging	5	4	4	4	12
	Total	48	20	28	32	80

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

SUGGESTED EXERCISES/PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1	1	Program to demonstrate use of printf() and scanf() statement.	2
2	1	Simple programs involving arithmetic, logical expression and conditional operator.	4
3	2	Program using if-else control statement, nested if –else and if-else-if ladder statement.	4
4	2	Program using switch-case statement.	4
5	2	Program using while and do- while loop	6
6	2	Program using for loop and nested for loops.	4
7	3	Program using one-dimensional array	4
8	3	Programs using two-dimensional array.	4
9	3	Menu driven program to manipulate strings.	4
10	4	Program using user defined function	6
11	4	Program using call by value, call by reference	2
12	4	Program using recursive function	4
13	5	Program to demonstrate use of malloc(), calloc().	4
14	5	Program to demonstrate use of pointer and pointer arithmetic.	4
15	5	Program using pointer to array.	4
16	5	Program to demonstrate pointer to function.	2
17	6	Program to read and write a file	2
Total			**64**

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.

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication
1	'C' in Depth	# S. K. Shrivastava	BPB Publication, 3rd Edition
2	Programming Languages, Design and Implementation	Terrence W. Pratt, Marvin V. Zelkowitz	PHI pub. 3rd Ed., 2001
3	Programming in ANSI 'C'	E. Balagurusamy	TMH, 4th edition, 2009
4	Working with 'C'	YashavantKanetkar	BPB Publication, 2008
5	Mastering C	K.R. Venugopal	MC Graw Hill

Text book

B) Software: Turbo C++.

C) Web sites for references:

1. http://cprogramminglanguage.net/
2. http://www.cprogramming.com/tutorial.html
3. http://www.programmingsimplified.com/c
4. http://cplus.about.com/od/learningc/ss/pointers2.htm
5. http://guideme.itgo.com/atozofc/

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2		2	2			1			2
CO2	3	2	3	1			2	2	2	
CO3	2	2	2	1						
CO4	3	2	3	1			2			2
CO5	2	2	2	1						
CO6	3	2	2	2				1		

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: OPERATING SYSTEMS **COURSE CODE: R18CP3402**

COURSE CATEGORY: CORE **CREDIT: 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.

Course Outcomes:

The students will able to

1. State the services and types of Operating System.
2. Illustrate the process managements, inter-process communication and concept of threads.
3. Analyze the process scheduling algorithms and classical problems of synchronization.
4. Describe the concept of the Deadlock and basics of memory management.
5. State the Memory allocation methods and solve problems on page replacement algorithm.
6. Differentiate different file and directory structures methods.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS	MARKS
1	**Introduction:** **1.1** Introduction to OS- Definition of OS, Goal of Operating system and Abstract view of the components of a computer system. Operating system services (functions), Types of Operating System- Batch Operating System, Multiprogramming Operating System, Time sharing systems, Real time systems, Distributed System. **1.2 Structure of Operating System**: Simple Structure, Layered Approach, Microkernel, Exokernel, Virtual Machine, client-server model.	1.a Operating system concept 1.b Services provided by an operating system. 1.c Types of operating system. 1.d Understand the various structures of O.S. 1.e Concept of shell, files, processes and system calls	10	12

	1.3 Concept: Processes, files, Shell, System calls.			
2	**Processes Management and Threads:** **2.1 Process Concept and scheduling:** Process, Process State, Process Control block, Scheduling Queues, Schedulers, Context switch, Operations on processes (only concept)- process creation and process termination. **2.2 Interprocess Communication:** Shared Memory System, Message Passing System- Naming, Synchronization, Buffering. **2.3 Threads:** overview, benefits, multithreading models-many to one, one to one, many to many	2.a Understand the concept of process, context switching 2.b IPC with its two types- shared memory and message passing 2.c Concept of threads.	**10**	**12**
3	**Process Scheduling:** **3.1 Basic Concepts**- CPU I/O Burst Cycle, CPU Scheduler, Preemptive Scheduling, Dispatcher. Scheduling Criteria Scheduling Algorithms- FCFS, SJFS, Priority Scheduling, Round Robin Scheduling, Multilevel Queue Scheduling, Multilevel Feedback Queue Scheduling. **3.2 Process Synchronization** — Critical Section Problem, semaphores (Usage), Deadlocks and Starvation. **3.3 Classic Problems of Synchronization**- Bounded-Buffer Problem, Readers-Writers Problem, Dining Philosopher Problem.	3.a Understand the concept of CPU scheduler 3.b Analyze different CPU scheduling algorithms. 3.c Critical section problem in IPC, Classical Problems of Synchronization	**12**	**16**
4	**4.1 Deadlocks:** Deadlock Characterization (Necessary Conditions, Resource Allocation Graph) Methods for Handling Deadlocks ,Deadlock Avoidance- safe state, resource allocation graph algorithm, Recovery from deadlock (Process Termination , Resource Preemption) **4.2 Memory Management :** Basic hardware, Address binding, logical vs. physical address space, dynamic loading, Swapping (concept).	4.a Understand the concept of Deadlock and memory management 4.b Understand the basic concept of memory management and swapping,	**10**	**12**
5	**5.1 Continuous memory allocation :** Continuous memory allocation,	5.a Continuous and non-continuous memory	**12**	**16**

	Memory mapping and protection, memory allocation, fragmentation. **5.2 Non- Contiguous allocation:** Paging- Basic Method, Hardware support (TLB), Protection Segmentation- Basic method, hardware. **5.3 Virtual memory management**- Background (Basic concepts) Demand paging-basic concepts(Page fault) Page replacement - Basic Page Replacement (concept), FIFO Page replacement, Optimal Page replacement, LRU Page replacement.	allocation 5.b Virtual memory management		
6	**File Management :** **6.1 File System**-File Concept, File Attributes, File Operations, File Types. Access Methods- sequential, direct. **6.2Directory Structure**- Storage structure, Directory overview, Single level directory, Two-level directory, tree structured directories, Acyclic Graph Directories, General graph directory, Protection – Types of access, access control **6.3 Disk Space Allocation Methods**- Continuous Allocation, Linked Allocation, Indexed Allocation. **6.4 Free Space Management**-Bit vector, Linked List, Grouping, Counting	6.a Understand the concept of file management, 6.b Various directory structures 6.c Disk allocation methods with free space management techniques.	**10**	**12**

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Introduction and Structure Operating System	10	4	8	-	12
2	Process management and threads	10	4	8	-	12
3	Process scheduling	12	4	8	4	16
4	Deadlock and Memory management	10	4	8	-	12
5	Contiguous , Non-contiguous and Virtual Memory Management	12	4	8	4	16
6	File management and Directory Structures	10	4	8	--	12
	Total	**64**	**24**	**48**	**08**	**80**

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

SUGGESTED LEARNING RESOURCES

B) Books

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

#Text Book

C) 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/

Mapping matrix of CO-PO's and PSO's:

Course Outcome	**Program Outcome**									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	2	1	1					1		
CO2	1	1	2					1		
CO3	1	2	2	1			1	1		1
CO4	2	1	1					1		
CO5	1	2	2	1			1	1		1
CO6	1	2	1					1		

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: DATA STRUCTURES **COURSE CODE: R18CP3403**

COURSE CATEGORY: CORE **CREDIT : 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:

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.

Course Outcomes:

The student will be able to

1. Understand basics of data structures, different types of data structures and design approaches of an algorithm.
2. Compare the efficiency of various searching and sorting algorithms in terms of both time and space.
3. Compare linear data structure implementation and recognize advantages and disadvantages of different implementations.
4. Implement linked lists in more than one manner.
5. Implement non-linear data structure like binary tree and BST.
6. Demonstrate the understanding and applications of non linear data structure like graph.

Course Details:

UNIT	NAME OF THE TOPIC (with Details)	LEARNING OUTCOME	HOURS	MARKS
1	1.1 **Structure and Union :** Declaration and initialization, storage allocation and size of structure, nested structure, defining union, union of structure, typedef, difference between structure and union. 1.2 **Introduction to Data Structures** : Definition, need and advantages, basic terminology, linear and non linear data structures, static and	Compare and analyze the efficiency of various algorithms in terms of both time and space.	6	12

	dynamic data structure, operations on data structures. 1.3 **Analysis of Algorithm:** Different approaches to design an algorithm. Analysis of an algorithm,Time complexity, space complexity,time-space tradeoff, Big O notation.			
2	2.1 **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 case. 2.2**Sorting :** Concept of Internal and External sort. Sorting algorithms – Selection sort, Bubble sort, Insertion sort, Merge sort, Radix sort, Quick sort, Heap sort and Bucket sort. Analysis of each sorting technique.	Implement various searching and sorting techniques.	**8**	**16**
3	3.1**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'. 3.2**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'. 3.3 **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.	Demonstrate understanding of abstract properties of various data structures such as array, stack, queue	**10**	**16**
4	4.1 **Linked List:** Structure of linked list, self referential structures,	Use various dynamic data structure such as linked list effectively in application programs.	**8**	**12**

	representation of a node in a linked list using structure, operation on linked list – traversal, insertion, deletion, search, advantages of linked lists over arrays. Array Vs Linked List. 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. Comparison between SLL, DLL, CLL. Algorithms and program to implement LL, DLL, CLL in 'C'.			
5	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. 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. 5.3 **Searching in Tree:** Depth first search algorithm, searching for a node in binary search tree, Breadth first search algorithm.	Implement Tree data structure for different searching and sorting techniques and applications	**8**	**12**
6	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 6.2	Implement abstract properties of graph data structure.	**8**	**12**

	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.			

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Introduction to Data structure and algorithm analysis	8	6	6	--	12
2	Searching and Sorting	8	4	8	4	16
3	Stack and Queue	8	4	8	4	16
4	Linked List	10	4	4	4	12
5	Tree	6	4	4	4	12
6	Graph	8	4	4	4	12
	Total	**48**	**26**	**34**	**20**	**80**

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

SUGGESTED EXERCISES/PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)
1	**2**	Program to implement linear search and binary search.
2	**2**	Menu driven program for insertion sort, bubble sort, selection sort.
3	**3**	Program to implement stack.
4	**3**	Program to implement linear queue.
5	**3**	Program to implement circular queue.
6	**4**	Implementation of linear linked list.
7	**4**	Implementation of circular linked list.
8	**4**	Implementation of doubly linked list.
9	**3,4**	Implement stack/queue as a linked list.
10	**5**	Creation of binary tree and traversal using recursive functions.
11	**5**	Creation of binary search tree and traversal using recursive functions.

SUGGESTED STUDENT ACTIVITIES

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

SPECIAL INSTRUCTIONAL STRATEGIES (if any)

1. Develop observation skills.
2. Develop Computer proficiency.
3. Develop logical thinking ability.

SUGGESTED LEARNING RESOURCES

A) Books

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	#Tannenbaum, Langsman, Augenstein	Data Structure using C	PHI Publications, 2nd 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, 3rd Edition, 2008
4	Behrouz A. Forouzan	Data structures	Cengage Learning

B) Software/Learning/ Simulations Websites

1. **Turbo C**

C) Web sites for references:

1. 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

Mapping matrix of CO- PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	1	2						2
CO2	1	2	2	2			2			2
CO3	1	2	2		2					3
CO4	3	1	2							2
CO5	1	2	3	2						1
CO6	2	2	3							2

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Object Oriented Programming with C++ **Course code: R18CP3404**

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	@25	-	50	175

@ Internal Exam

Rationale:

Object oriented programming is now used for most software projects. Object oriented programming offers a new and powerful way to cope with complexity. Among the Object oriented programming languages available C++ is most widely used language. This subject acts as a foundation for languages like JAVA, VC++.

Course Outcomes:

1. Understand basic concepts of OOP languages, define class, objects
2. Solve problems using object oriented approach.
3. Implement various types of inheritances
4. Implement polymorphism concept, its types and virtual function.
5. Use console I/O and perform file operations using streams.
6. Use template for generic programming and graphics functions.

Course Details:

UNIT	NAME OF THE TOPIC (with Details)	LEARNING OUTCOMES	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	Understand fundamental concepts of object-oriented languages	12	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	Use appropriate constructor Implement Operator Overloading	10	12

3	**3.1 Inheritance :** Introduction , Derived classes, single Inheritance, inheriting private members, Member declaration: protected, public and private , member accessibility and visibility modes **3.2 Types of inheritance:** Single, Multilevel, Multiple, Hierarchical, Hybrid, Multipath inheritance, Virtual base classes, Abstract Classes, Constructors in derived classes.	Implement Inheritance	10	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. **4.2Exception Handling:** Introduction , Basics of Exception Handling, Exception handling mechanism , throwing and catching mechanism	Implement Polymorphism	10	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	Implement File Handling	12	16
6	**6.1 Templates :** Introduction, Class Templates, General format of class template and its definition, Class template with multiple parameters, Function templates, Syntax of Function template, Function templates with two generic types. **6.2 Introduction to Graphics Programming:** **Text mode graphics:** Functions-gotoxy() , textbackground(), textcolor(), window() function , cputs(), cprintf(), textattr(). **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().	Understand use of generic programming with template Use graphics functions to draw graphical shapes.	10	12

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	**1.1** Introduction to Object Oriented Programming **1.2** Beginning with C++ **1.3** Objects and Classes	12	4	4	8	16
2	2.1 Constructors and Destructors 2.2 Operator Overloading	10	4	4	4	12
3	Inheritance	10	4	4	4	12
4	4.1 Polymorphism 4.2 Exception Handling	10	4	4	4	12
5	5.1 I/O system basics 5.2 File–Handling	12	4	4	8	16
6	6.1 Templates 6.2 Introduction to Graphics Programming	10	4	4	4	12
	Total	**64**	**24**	**24**	**32**	**80**

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

SUGGESTED EXERCISES/PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1	**1**	Develop Program to define a class and create an object of a class	**2**
2	**1**	Develop Program to create & manipulate array of objects	**2**
3	**1**	Develop Program using static member variables	**1**
4	**1**	Develop Program for passing object as an argument to function	**2**
5	**2**	Develop Program using constructor & destructor functions in class	**2**
6	**2**	Develop Program having constructor with default arguments	**1**
7	**2**	Develop Program for overloading unary & binary operators	**2**
8	**3**	Develop Program for implementation of single & hierarchical inheritance	**2**
9	**3**	Develop Program to implement multiple inheritance	**1**
10	**4**	Develop Program for function overloading	**1**
11	**4**	Develop Program for function overriding	**1**
12	**4**	Develop Program for implementation of polymorphism using virtual function	**2**
13	**4**	Develop Program using pointer to object and array of objects	**2**
14	**4**	Develop Program for string manipulation using pointer to string	**2**
15	**4**	Develop Program using this pointer	**2**
16	**5**	Develop Program using manipulators to format output	**1**

17	**5**	Develop Program for file – writing to file and reading the contents of file	**2**
18	**5**	Develop Program for file copy	**1**
19	**6**	Develop Program using template	**1**
20	**6**	Develop Program to demonstrate use of graphic functions.	**2**
		Total	**32**

SUGGESTED STUDENT ACTIVITIES

Mini project which incorporates more than one OOPs features

SUGGESTED LEARNING RESOURCES

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# E. Balagurusamy	Object Oriented Programming with C++	TMH, New Delhi, 6th 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, 3rdEd., 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/

Mapping matrix of CO- PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	**3**	**2**	**2**				**2**			**2**
CO2	**2**	**2**	**2**				**1**			**2**
CO3	**2**	**2**	**3**							**1**
CO4	**2**	**2**	**3**							
CO5	**1**	**3**	**3**	**2**		**1**	**2**			**2**
CO6	**1**	**2**	**2**	**1**		**2**				**1**

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

Course : Microprocessors and Programming **Course code: R18CP3405**

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	_	@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.

Course Outcomes:

1. Understand functional block diagram of 8086 and operating modes of 8086
2. Use instructions in different addressing modes.
3. Use assembly language programming tools to develop an assembly language program.
4. Analyze the functional block diagram of 80386 and Pentium.
5. Define various interrupts and understand their need.
6. Understand use of support chips.

Course Details:

UNIT	NAME OF THE TOPIC (with Details)	LEARNING OUTCOMES	HOURS	MARS
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.	Understand the working of different processors Draw the architecture of 8086 Understand about Pinout of 8086	10	12
2	**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	Understand the assembly language program development steps Understand use of MASM software Compile, link and debug the assembly language programs	12	12

3	**Assembly Language Programming Techniques :** Data Transfer instructions, Arithmetic Instructions,Bit manipulation instructions,String Instructions,Iteration Control Instructions,Interrupt Instructions ,Conditional Jump (Branch) Instructions,Flag Manipulation Instructions, Program Development Process/steps, Debugging assembly language programs. CALL, JMP instructions, Macros-Defining a MACRO, Passing Parameters to a MACRO, Writing & using macros.	Understand the assembly language program development steps Understand use of MASM software Compile, link and debug the assembly language programs	**12**	**16**
4	**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.	Understand the working of different processors Draw the architecture of 80386,Pentium Understand i_3.i_5, i_7 processors	**12**	**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.	Understand Interrupts and Interrupt Service Procedures Define various interrupts	**8**	**12**
6	**Support Chips :** 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, partial & PROM decoder.	Understand Support Chips	**10**	**16**

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	**Unit Title**	**Teaching Hours**	**Distribution of Theory Marks**			
			R Level	**U Level**	**A Level**	**Total Marks**
1	Architecture Of 8086	10	6	6	--	12
2	8086/8088 Instruction Set and Assembler Directives	12	4	4	4	12
3	Assembly Language Programming Techniques	12	4	4	8	16
4	Architecture Of 80386 and Pentium	12	6	6	-	12

5	Interrupts and Interrupt Service Procedures	8	6	6	-	12
6	Support Chips	10	8	8	-	16
	Total	**64**	**32**	**32**	**16**	**80**

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

SUGGESTED EXERCISES/PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1	2,3	Develop and Execute assembly language program to add two 16 bit numbers	1
2	2,3	Develop and Execute assembly language program to add series of 16 bit numbers	2
3	2,3	Develop and Execute assembly language program to subtract two 16 bit numbers	1
4	2,3	Develop and Execute assembly language program to multiply two 8 bit unsigned numbers	1
5	2,3	Develop and Execute assembly language program to multiply two 16 bit unsigned numbers	1
6	2,3	Develop and Execute assembly language program to multiply two 16 bit signed numbers	1
7	2,3	Develop and Execute assembly language program to divide 16 bit unsigned number by 8 bit unsigned number	1
8	2,3	Develop and Execute assembly language program to divide 32 bit unsigned number by 16 bit unsigned number	2
9	2,3	Develop and Execute assembly language program to divide two 16 bit unsigned numbers	2
10	2,3	Develop and Execute assembly language program to divide two 16 bit signed numbers	2
11	2,3	Develop and Execute assembly language program to add two BCD numbers	1
12	2,3	Develop and Execute assembly language program to add two ASCII numbers	1
13	2,3	Develop and Execute assembly language program to find largest among block of data	1
14	2,3	Develop and Execute assembly language program to find smallest among block of data	1
15	2,3	Develop and Execute assembly language program to arrange numbers in ascending order	2
16	2,3	Develop and Execute assembly language program to arrange numbers in descending order	2
17	2,3	Develop and Execute assembly language program to Count even/odd data elements in a given string	2
18	2,3	Develop and Execute assembly language program to Count positive/negative data elements in a given string	2
19	2,3	Develop and Execute assembly language program to Data block transfer using string instructions	2
20	2,3	Develop and Execute assembly language program to Searching target data in a given string	2
21	2,3	Develop and Execute assembly language program to Compare two strings using string instruction	2
		Total	32

STUDENT ACTIVITIES:

Following is the list of proposed student activities like:

1. Develop unit wise topics related programs in laboratory.
2. Prepare the charts of block diagram & pin diagram of 8086 Microprocessor.
3. Prepare the charts of Instruction set of 8086 Microprocessor.
4. Prepare evolution chart for microprocessor families.

SUGGESTED 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,3rd 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, 7th Edition.
4	Peter Abel	Assembly Language Programming	Prentice Hall of India Second Edition 1994.

B) Software:

Microsoft Assembler

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*

Mapping matrix of CO- PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	2						1
CO2	2	3	2	2						
CO3	3	3	3	2			2			2
CO4	2	2	2	1			2			2
CO5	2	2								1
CO6	2	3	3	2						3

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: DATABASE MANAGEMENT SYSTEMS COURSE CODE: R18CP3406

COURSE CATEGORY: CORE CREDIT: 6

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
3+1(T)	2	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.

Course Outcomes:

Students will be able to

1. Understand the concept of database systems and draw ER diagram.
2. Create database, modify, and append data in database.
3. Apply integrity constraints and normalize database to normal forms.
4. Write PL/SQL programs and handle the errors in PL/SQL.
5. Write cursor programs and apply the concept of transaction and concurrency control.
6. Write function programs and know the concept of distributed database.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOMES	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.	1.a. Understand the concept of data, database and DBMS. 1.b. Describe the database architecture. 1.c. Describe database languages 1.d. Identify the various components of the E-R model and Draw the E-R diagram.	**8**	**12**

	Entity-relationship diagrams: Basic Structure, Mapping Cardinality, Complex Attributes, Roles, Nonbinary Relationship Sets, Weak Entity Sets.			
2	**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.	2.a. Creating the tables using DDL commands and manipulating the data using DML commands 2.b. Write the SQL queries.	**8**	**16**
3	**3.1 Security & Integrity** Security management in SQL- granting and revoking permission. Integrity constraints: Types of integrity constraints:-1) Domain integrity constraint 2) Entity integrity constraint 3) Referential integrity constraint, Concept of Authorization. Encryption and its Applications – Encryption Techniques. **3.2 Relational Database Design** Pitfalls in relational database design, Functional Dependencies, Normalization, Types of Normalization 1NF, 2NF, 3NF, BCNF.	3.a. Writing the queries for creating the user and granting the permissions. 3.b. Describe the integrity constraints 3.c. Normalize the database using different normal forms	**8**	**12**
4	**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).	4.a. Write the simple PL/SQL programs using control structures 4.b. Handling the in-built and user defined exception	**9**	**16**
5	**5.1 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. Programs based on cursors. **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.	5a. Write PL/SQL program using cursor. 5b. Understand the concept of Transaction, ACID properties and Locks 5c. Understand the Deadlock concept and Deadlock Handling	**8**	**12**
6	**6.1 PL/SQL Database Objects (Functions):** What are Functions? Where do stored functions reside? How does the oracle engine execute functions? Advantages and disadvantages of using functions, and functions syntax, deleting function. Programs based on functions. **6.2 Distributed Databases :** Distributed Systems- Concept and its advantages and disadvantages. Homogenous and Heterogeneous Databases Distributed Data storage-- Data replication, Data fragmentation, Transparency. Distributed Transactions—System Structure, System Failure Modes.	6a. Write the PL/SQL program using functions. 6b. Understand the concept of distributed database, data storage and distributed transaction.	7	12

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1.	Introduction and Entity Relationship Model	8	4	8	-	12
2.	Structured Query Language	8	4	8	4	16
3.	Security and Integrity , Relational Database Design	8	4	8	-	12
4.	Procedural Language / Structured Query Language	9	4	8	4	16
5.	Cursor , Transaction and Concurrency Control Manager	8	4	4	4	12
6.	PL/SQL Database Objects (Functions) and Distributed Databases	7	4	4	4	12
	Total	**48**	**24**	**40**	**16**	**80**

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

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

SUGGESTED EXERCISES/PRACTICALS

Sr. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1.	2	Use of DDL commands.	4
2.	2	Use of DML commands.	4
3.	2	Use of aggregate function, group by, order by and having clause.	2
4.	2	Use of all set operators.	2
5.	2	Use of different types of joins.	2
6.	3	Use of Domain and Entity Integrity constraints.	2
7.	3	Use of Referential Integrity constraints.	2
8.	4	Use of conditional statements in PL/SQL.	2
9.	4	Use of iteration statements in PL/SQL.	2
10.	4	Use of Exceptions in PL/SQL.	2
11.	5	Use of Implicit cursor.	2
12.	5	Use of Explicit cursor.	2
13.	5	Use of Cursor for loop and parameterized cursor	2
14.	6	Use of Functions in PL/SQL	2
		Total	**32**

SUGGESTED STUDENT ACTIVITIES

Following is the list of proposed activities:

5. Find information about the various database management systems.

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication (with year)
1	Abraham Silberschatz, Henry F. Korth, S. Sudarshan	Database System Concepts	Tata Mc-Graw Hill Publications, 6th Edition, 2005
2	Jeffrey D. Ullman	Principles of Database System	Galgotia Publication, 3rd Edition, 2007
3	Ivan Bayross	SQL, PL/SQL – The Programming language of Oracle. 4th Revised Edition	BPB Publications, 4th 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, 1st Edition, 2004
6	Vikram Vaswani	MySQL database usage and Administration	Tata Mc-Graw Hill Publications, 1st Edition, 2009

B) Major Equipment/ Instrument with Broad Specifications

- Desktop Computers and LCD Projector
- Oracle / MySql / Any RDBMS software

C) Software/Learning/ Simulations Websites

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

Mapping matrix of PO's and CO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	1						
CO2	1	3	3	2			1		1	1
CO3	1	2	2	1			1		1	
CO4	1	3	3	2			1		1	1
CO5	1	2	2	1			1		1	
CO6	1	2	2	1			1			

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE : COMPUTER NETWORKS COURSE CODE: R18CP3407

COURSE CATEGORY : CORE CREDIT : 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:

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.

Course Outcomes:

The students will able to

1. Identify type of network, topology, components and its role in different applications.
2. Select specific Ethernet type from given criteria.
3. Describe principles, design issues of layers and relate protocols with OSI and TCP/IP model layers.
4. Relate protocols of transport and application layer
5. Design networks with IPV4 addressing.
6. Identify role of cryptography in various Network applications.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS	MARKS
1	**Introduction :** 1.1 Computer network, need & application. Classification of network by their component role: Peer to Peer, Client-Server, Internet connectivity requirements 1.2 LAN,MAN,WAN, Wi-Fi, WiMAX Network Topology - Bus topology, Ring topology, Star topology, Mesh Topology, Hybrid Topology 1.3 Network components: Hub, switch, types of switches, router, bridge, repeater, gateway, modem, Wireless devices	Understand the types of networks & types of topology. Also able to understand different types of network components.	**9**	**12**
2	**Local Area Network :** 2.1 Architecture of LAN : Project 802 Ethernet, Access method (CSMA/CD) 2.2 Implementation-Thick Ethernet(10 Base 5),Thin Ethernet(10 Base 2) Fiber Distributed Data Interface (FDDI) 2.3 Ethernet Networks: Switched Ethernet, Fast Ethernet, Gigabit Ethernet 2.4 Wireless LAN Standards : IEEE 802.11,HiperLAN,Bluetooth	Able to understand the Project 802 along with Ethernet networks.	**11**	16

3	**Data link and Network Layer Protocols :** 3.1Design 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. 3.4IP:IP Datagram, Version, Service Type, Identification, Flags, TTL, Protocol, header, Checksum, Options. IPv6introduction, Neighbor Discovery Protocol, difference between IPv4 and IPv6 3.5ARP : ARP Introduction, Structural Diagram, ARP Process RARP : RARP Introduction, RARP Process	Understand the protocols used at data link & network layer.	**12**	16
4	**Transport and Application Layer Protocol** 4.1 TCP : Introduction to ports, sockets, TCP Service Model, TCP Protocol, TCP Segment Header. 4.2UDP: 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 4.6 HTTP: Header,Methods	Understand the protocols used at Transport & Application layer.	**10**	**12**
5	**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	Understand the IP address classes & resolution of DNS addresses.	**10**	**12**
6	**Network Security** 6.1 Need of Security, IDS,Threats to security-Viruses ,Worms, Intruders, Insiders, Criminal organizations, Terrorists, Security Attacks 6.2 Cryptography, Types of Ciphers : Substitution & Transposition Cipher Key management, SSL introduction 6.3 Encryption : Encryption Model, Digital Signature, Symmetric Key Algorithm, public key algorithm 6.4 Web security, Firewall ,VPN 6.5 Cyber Crime and Cyber Forensics	Understand the Network and web security importance.	**12**	**12**

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Introduction to Networks	9	6	6	--	12
2	Local Area Network	11	8	8	--	16
3	Data link and Network Layer Protocols	12	6	6	4	16
4	Transport and Application Layer Protocol	10	4	4	4	12
5	IP Addressing and DNS	10	4	4	4	12
6	Network Security	12	4	4	4	12
	Total	**64**	**32**	**32**	**16**	**80**

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

SUGGESTED EXERCISES/PRACTICALS

SR. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Approx. Hrs. Required
1	1,2	Design of a network for computer laboratory	4
2	1	Case study of internet connectivity requirements, setup, and network control devices.	4
3	1,2,3	Design a network on given topology and implement it on network simulator	4
4	3,4	Design a network to observe congestion problem using network simulator	4
5	3,5	Design a network to find best suitable path in case of link failure.	4
6	6	Design wireless network and observe the performance.	4
7	2	Design optical network and observe the performance.	2
8	3,4,5	Capture the packets and study protocol format using packet analyzer tool.	2
9	6	Encrypt the message using cryptographic algorithms.	4
Total			32

SUGGESTED STUDENT ACTIVITIES

1. Preparation of a network setup for data sharing.

SPECIAL INSTRUCTIONAL STRATEGIES (if any)

1. Implement various network commands
2. Crimping of cable for peer to peer network

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication (with year)
1	Data Communication and networking (2nd Edition)	# Behrouz A. Forouzan	TMG,2nd Ed;2003
2	Computer Networks	# A.S.Tanenbaum	PHI,4th Ed;2002
3	Network Security Essentials	William Stalling	PHI,3rd Ed;2006
4	Computer Networks And Internets with Internet Applications	Douglas E. Comer	PE,4th Ed;2003

B) Major Equipment/ Instrument with Broad Specifications

1. Use of Switch & Router in Networking Lab

C) Software/Learning/ Simulations Websites

1. Use of different network simulator tools like Packet Tracer to draw network structure**.**

D) Web sites for references:

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

Mapping matrix of CO-PO'S and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	3	1					2		2
CO2	3	2	3	2				2	1	
CO3	3	3	2		2			1	2	2
CO4	3		1	3				2	2	
CO5	3	2	3	1				2		
CO6	3			2	2				2	2

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE : SOFTWARE ENGINEERING COURSE CODE: R18CP3408

COURSE CATEGORY : CORE CREDIT : 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.

Course Outcomes:

The students will be able to

1. Construct generic view of software engineering, process model.
2. Understand requirement engineering and build analysis model.
3. Understand how to design the model and various types of architecture.
4. Test, debug and run the software by using various software testing techniques and also assure the quality of software (Qos).
5. Understand how to make time and budget estimation for software project.
6. Identify the risk management and configure the software project scheduling.

Course Details:

UNIT	NAME OF THE TOPIC (with Details)	LEARNING OUTCOME	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;	**Understand the characteristics and application of software along with different process models.**	11	12

	Agile process models - Agile process models, Extreme programming.			
2	**Requirement Engineering:** Requirement engineering, Initialing the process, Eliciting requirement, Building the Analysis Model, Negotiating, Validating requirements. Building Analysis Model: Analysis Modeling Approaches- Data modeling Concept, Object Oriented Analysis, Scenario-Based Analysis, Requirements Modeling strategies, Flow-Oriented Modeling, SRS.	**Understand the Analysis model and Prepare Software Requirement Specification.**	**12**	**16**
3	**Design Engineering:** Design Process, Design concepts (Abstraction, Modularity, Information hiding, Functional Independence, Refinement), Design model (Data Design, Architecture Design, Interface Design, Component level Design); Software architecture- Control Architecture, Structural Partitioning, Functional Independence (Cohesion and Coupling). Architectural styles: Data centered architectures, Data flow architectures, Call and return architectures, Object oriented architectures, layered architectures.	**Understand design concepts, different software architectures and software architectural styles, DFDs.**	**9**	**12**
4	**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. **Testing Tactics**- Software testing fundamentals, White box testing, basis path testing, Control structure testing, Black box testing. **Software Quality Assurance**- SQA activities, Software Reviews, FTR	**Understand software testing fundamentals, SQA activities, Formal technical review and write test cases for various application software.**	**12**	**16**
5	**Process and project Metrics:** Metrics in process and project domains, software measurement metrics for software quality, **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.	**Understand the software measurement metrics for software quality and Empirical estimation models.**	**10**	**12**
6	**Risk Management**: Reactive versus proactive Software Risk, Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation, Monitoring & Management, The RMMM plan. **Project Scheduling:** Basic Principles, Defining task set for software project, defining a task network, scheduling	**Understand Risk Mitigation, Monitoring, and Management Plan, project scheduling and Software configuration management process.**	**10**	**12**

	(Timeline chart, Tracking the schedule). **Software Configuration Management**: Software Configuration Management, SCM Repository, SCM process.			

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Introduction to software Engineering	11	6	6	-	12
2	Requirement Engineering	12	8	8	-	16
3	Software Testing Techniques	9	4	6	2	12
4	Design Engineering	12	6	6	4	16
5	Process and project Metrics, Software project estimation	10	6	6	-	12
6	Risk management and project scheduling	10	6	6	-	12
	Total	**64**	36	38	6	**80**

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

SUGGESTED EXERCISES/PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1	**2**	Requirement analysis for the given software application	**4**
2	**2**	Creation of data dictionary for given software application.	**4**
3	**2**	Draw E-R diagram for the given software system.	**6**
4	**2**	Convert E-R diagram to database tables.	**4**
5	**3**	Draw use-case diagram for given software application.	**4**
6	**3**	Draw data flow diagram up to level 3 for the given software application.	**6**
7	**4**	Write Test cases for software application.	**4**
Total			**32**

PROFESSIONAL PRACTICES:

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.

SUGGESTED LEARNING RESOURCES

A) Books

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

Text book

A) Software: Star UML, Edraw max.

B) Web sites for references:

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/

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	2			2				2
CO2	2	2	3	2		2			2	
CO3	2	1	2	1					2	1
CO4	2	2	2	3	2	1				
CO5	2	1	2			2				2
CO6	2	2	2			2				

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE : DATA COMMUNICATION COURSE CODE: R18CP3409

COURSE CATEGORY : CORE CREDIT: 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:

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.

Course Outcomes:

The students will able to

1] Select type of signal and data conversion techniques for different applications
2] Identify type of transmission media for given application.
3] Analyze various encoding techniques.
4] Predict multiplexing and switching technique for given task.
5] Identify role of each layer in OSI and TCP/IP model
6] Recognize data communication technology for different applications.

Course Details:

UNIT	NAME OF THE TOPIC (with Details)	LEARNING OUTCOME	HOURS	MARKS
1	**1.1Introduction 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 **1.2Computer Communications and Networking Models** Decentralized Systems, Centralized Systems, Distributed Systems, Client/Server model, Peer to Peer model, web based model **1.3Communication methods and data transmission modes** Serial and parallel communications, Synchronous, Asynchronous and Isochronous Communication, applications of each, Simplex, half	Understand the importance of communication in networking & networking models.	8	12

	duplex and full duplex transmission			
2	**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, **2.4** Cellular Network Introduction	Understand the different types of transmission media used in computer networking	9	16
3	**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	Understand the conversion & need of analog data to digital data and vice versa	10	16
4	**Multiplexing and Switching** **4.1**FDM,TDM,Statistical multiplexing, Wavelength Division multiplexing, Inverse multiplexing **4.2** Circuit Switching, Packet switching, Hybrid Switching.	Understand use of Multiplexing & switching in computer networking	6	12
5	**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	Understand how to set networking standards.	7	12
6	**Data Communication Technologies** **6.1**Broadband- Mobile broadband – wireless internet access, types of Modems, wireless broadband **6.2**FCC,TRAI, Spectrum management, Radio frequency spectrum, frequency bands, licensing **6.3**Satellite Communication Types- GEO,MEO,LEO, examples and applications	Study of advanced data communication technologies	8	12

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Introduction to Communication	8	6	6	--	12
2	Transmission Media	9	4	12	--	16
3	Analog and digital Communication	10	6	6	4	16
4	Multiplexing & Switching	6	4	8	--	12
5	Networking Standards & References	7	4	8	--	12
6	Data Communication Technologies	8	4	8	--	12
	Total	**48**				**80**

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

SUGGESTED EXERCISES/PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1	3	Generation of PAM signals, waveform observation and measurements.	4
2	3	Generation of analog signal and verification of sampling theorem.	2
3	3	Generation of PCM signals, waveform observation and measurements.	4
4	3	Demodulation of PCM signals, waveform observation and measurements.	2
5	3	Generation of ASK signals, waveform observation and measurements.	4
6	3	Demodulation of ASK signals, waveform observation and measurements	2
7	3	Generation of FSK signals, waveform observation and measurements.	4
8	3	Demodulation of FSK signals, waveform observation and measurements.	2
9	3	Generation of PSK signals, waveform observation and measurements.	4
10	3	Demodulation of PSK signals, waveform observation and measurements.	2
11	3	Binary data generation and observation of NRZ-L,NRZ-I,RZ, Manchester encoding types.	2
Total			32

SUGGESTED STUDENT ACTIVITIES

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

SUGGESTED LEARNING RESOURCES

A) Books

Sr.No.	Title of Book	Author	Publication (with year)
1	Data Communication and networking(2nd edition)	# Behrouz A. Forouzan	TMG,2nd Ed;2003
2	Computer Networks	A.S.Tanenbaum	PHI,4th Ed;2002
3	Network Security Essentials	William Stalling	PHI,3rd Ed;2006
4	Data Communications and Networks	Achyut Godbole	TMG,1st Ed;2002

B) Software/Learning/ Simulations Websites

C) 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
5. http://fcit.usf.edu/network/

Mapping matrix of CO- PO'S and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	1	2	2	1			1		
CO2	3	1	3	2	1			2		1
CO3	3	2	3	2					2	
CO4	2	2	1	2					2	
CO5	2	2		2					2	
CO6	1	2	1	2	2					2

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE : Digital Techniques COURSE CODE: R18 EX3415

COURSE CATEGORY: Core CREDIT: 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 course Digital Techniques is 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.

Course Outcomes:

The students will be able to

1. Understand and use binary, octal, hexadecimal number systems and laws of Boolean algebra.
2. Understand concept and working of combinational circuits
3. Understand concept of Flip flops , their types and applications
4. Understand types and working of counters and registers
5. Understand A to D and D to A conversion concepts, types and working.
6. Compare features and design of various logic families.

Course Details:

UNIT	NAME OF THE TOPIC (with Details)	LEARNING OUTCOME	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.	Understand the concept of Binary numbers, Logic gates and laws of Boolean algebra	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	Understand the concept of SOP an POS, K-map, Use of K-map for simplification of logic expressions	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	Understand the concept of Flip-Flop, types of FFs and applications of FFs	9	12
4	**Counters and Registers** 4.1Concept 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	Understand the Concept of counters, modulus of counter, types of counters, Operation of counters Understand the Concept of register, shift registers and their types	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	Understand the Concept of A to D and D to A conversion, types	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 .	Understand the Concept of logic families, comparative study of logic families	6	12

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Number Systems	9	6	4	6	16
2	Combinational Logic Circuits	8	4	4	4	12
3	Flip-flops	9	6	6	--	12
4	Counters and Registers	9	4	8	4	16
5	ADC And DAC	7	6	6	-	12
6	Logic Families	6	6	6	-	12
	Total	**48**	32	34	14	**80**

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

SUGGESTED EXERCISES/PRACTICALS

SR.NO.	UNIT	Practical Exercises (Outcomes' in Psychomotor Domain)	Hrs. Required
1	**1**	Verify the truth tables of logic gates	**4**
2	**1**	Construction of basic gates using universal gates	**4**
3	**2**	Construction of half adder and full adder	**2**
4	**1**	Verification of De-Morgan's theorem	**2**
5	**2**	Multiplexer using IC 74153	**4**
6	**2**	Demultiplexer/Decoder	**2**
7	**2**	Binary to grey code converter	**4**
8	**3**	Verification of truth tables of flip-flops using ICs 7474, 7476	**2**
9	**4**	Construction of shift register using IC 7495	**2**
10	**4**	Ring counter and Johnson counter	**2**
11	**4**	Design of decade counter using IC 7490	**2**
12	**5**	Design of R-2R ladder DAC	**2**
		Total	**32**

SUGGESTED STUDENT ACTIVITIES

1. Assemble the logic circuits and testing of logic circuits

SPECIAL INSTRUCTIONAL STRATEGIES (if any)

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

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication (with year)
1	Digital Principle	#Malvino and Leach	TMH, 6th Ed, 2009
2	Modern Digital Electronics	#R. P. Jain	TMH, 4th Ed, 2010
3	Digital Logic and Computer Design	M. Morris Mano	Pearson Edu,4th Ed, 2008
4	Digital Integrated Electronics	H. Taub, Schilling	McGraw Hill Int,

Mapping matrix of CO- PO'S and PSO's:

Course Outcome	Program Outcome									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	1	1	1		2			2		2
CO2	3		3	2	1	1		1		
CO3	1	2	3		2	2	1	2	2	
CO4	2	1	1	2	2				1	2
CO5	1			1		2	2		1	2
CO6		3	1	1	2				2	1

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE : WEB DESIGN COURSE CODE : R18CP4401

COURSE CATEGORY : APPLIED CREDIT : 4

Teaching and Examination Scheme:

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

Course Outcomes:

The students will be able to

1. Design simple web pages- using HTML.
2. Link HTML pages and insert image.
3. Organize information using Tables, forms & Frames.
4. Format web pages Using CSS
5. Integrate html pages, multimedia elements to develop Web sites.
6. Use Dreamweaver tool effectively.

Course Details:

UNIT	NAME OF THE TOPIC (with Details)	LEARNING OUTCOME	HOURS
1	**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. **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, moonscape, underlined, strike-through, superscript, subscript, Horizontal Rules – colors in Web page, background color, Text color, Link color, Special	Design simple html web page using basic tags	6

	characters Lists - Ordered lists, Unordered lists, Definition list, Nesting lists. The Div tag, The Object tag.		
2	**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. 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>	Integrate html pages, multimedia elements to develop Web sites.	**5**
3	**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. **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.	Organize information using Tables, forms & Frames.	**6**
4	**4.1DHML 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. **4.2 Introduction to W3C standards for web sites:** What is W3C? What are W3C standards? What are ECMA Standards, HTTP error codes.	Format webpages with CSS and understand error codes of HTML	**5**
5	**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. **5.2 Painting with Photoshop:**The line tool, painting tools - brush tool, paint bucket, options palette for painting and editing tools, filling and	Use adobe Photoshop Effectively, Edit images and apply effects to photos by using layers and filters.	**5**

	stroking selections, choosing foreground and background colors, using color picker tool, Use of smudge tool. **5.3 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 Filters -Previewing and applying filters, using filters for creating special effects, Improving performance with filters, choosing filter effect.		
6	**6.1 Overview of XML:** Overview of XML, DTD, Web Services, XML Creating an simple XML Web Services,Setting Web Method Attribute, Setting Web Services 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.	Understand XML Web Services	**5**

SUGGESTED EXERCISES/PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Hrs. Required
1	**1**	Create Web page and apply some block level tags, text level tags.	**2**
2	**1**	Create web pages using paragraph formatting tags.	**2**
3	**1**	Use ordered list and unordered list in web page.	**2**
4	**2**	Create Web using hyper links to same page, other page.	**2**
5	**2**	Use Dreamweaver to include images with different alignments and wrapped text.	**2**
6	**4**	Create webpage using CSS.	**4**
7	**5**	Import images in Photoshop and modify their colors, contrast, and tone in selected areas.	**2**
8	**5**	Merging two or more images using layers.	**2**
9	**5**	Create special effects on images using filters.	**2**
10	**1to 6**	Create a simple website by using HTML and CSS	**12**
Total			**32**

SUGGESTED STUDENT ACTIVITIES

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.

SUGGESTED LEARNING RESOURCES

A) Books

Sr.No.	AUTHOR	TITLE	PUBLISHER
1	Thomas a. Powell	HTML & XHTML : The Complete Reference	Tata McGraw Hill, 4th 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, 1st Edition, 2002
4	Adobe International	Adobe Photoshop users guide	Adobe Publication
5	Gary David Bouton	Adobe Photoshop Fundamentals	TechMedia Publication

B) Major Equipment/ Instrument with Broad Specifications

C) Software/Learning/ Simulations Websites

1. **Adobe Dreamweaver**
2. **Web browser**
3. **Adobe Photoshop**

D) Web sites for references:

1. www.w3schools.com
2. www.htmlhelp.com
3. http://www.webstandards.org/learn/faq/

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1-	3	1	2						2	
CO2	2	2								
CO3	2	2	2							
CO4	3	1	1			2				2
CO5	2	2	2			2				2
CO6	2	2	2							2

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: USER INTERFACE PROGRAMMING **COURSE CODE: R18CP4402**

COURSE CATEGORY: APPLIED **CREDIT : 4**

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
02	02	-	-	-	50	-	50	100

Rationale: .Net is a software framework developed by Microsoft. It is used to develop different types of applications like Windows, Web application and Mobile based applications etc. The .NET Framework includes various technologies, such as ASP.NET, VB.NET, C#.NET etc. VB.Net is an object-oriented computer programming language and it as Integrated Development Environment, in which the applications can be developed, run, test, and debug. This course helps in understanding the principles and techniques involved in developing applications and graphical user interface.

Course Outcomes:

Students will be able to

1. Write and compile a Console based program.
2. Write the programs using data types, operators, classes etc.
3. State the components of .Net Framework.
4. Design and use the forms.
5. Identify and use different category of controls.
6. Perform operations on database.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS
1.	**Introduction** What Is the Microsoft .NET Framework?, What Is Visual Basic .NET, An Example Visual Basic .NET Program	1.a Know the the .NET Framework and Visual Basic .NET. 1.b Know how to write and compile a Console application.	4
2.	**The Visual Basic .NET Language** Source Files, Identifiers, Keywords, Literals, Types, Namespaces, Symbolic Constants, Variables, Scope, Access Modifiers, Assignment Operators and Expressions, Statements, Classes, Exceptions.	2.a Know the basics and syntax of the Visual Basic .NET language. 2.b Understand the Classes and Exception.	6

3.	**The .NET Framework** Common Language Infrastructure (CLI) and Common Language Runtime (CLR), Common Type System (CTS), Portions of the CLI Modules and Assemblies, Application Domains, Common Language Specification (CLS), Intermediate Language (IL) and Just-In-Time (JIT) compilation, Metadata, Memory Management and Garbage Collection	3.a Understand the different components of the .NET Framework.	4
4.	**Windows Forms I: Developing Desktop Applications** Creating a Form, Handling Form Events, Relationships Between Forms, MDI Applications.	4.a Know how to create forms, compile and make MDI application.	6
5.	**Windows Forms II: Controls, Common Dialog Boxes, and Menus** Common Controls and Components, Control Events, Form and Control Layout, Common Dialog Boxes, Menus.	5.a Know individual controls, and their use. 5.b Use common dialog boxes and menus in the application.	6
6.	**ADO.NET: Developing Database Applications** A Brief History of Universal Data Access, Managed Providers, Connecting to a SQL Server Database -SQL Server Authentication, Connecting to an OLE DB Data Source, Reading Data into a DataSet, Relations Between DataTables in a DataSet, Binding a DataSet to a Windows Forms DataGrid, Binding a DataSet to a Web Forms DataGrid, Typed DataSets, Reading Data Using a DataReader, Executing Stored ProceduresThrough a SqlCommand Object	6.a Know how to connect to MS-Access /Oracle/MySQL database. 6.b Know to create, store and retrieve data from database.	6

SUGGESTED EXERCISES/PRACTICALS

Sr. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Approx. Hrs. Required
1.	2	Write console based program to calculate simple interest.	2
2.	2	Write console based program to implement concept of selection logic and iteration logic.	2
3.	2	Write console based program using functions and procedures.	2
4.	2	Write console based program Using Arrays (Fixed size & Dynamic arrays) and collections.	2
5.	2	Write console based program to implement the concept of Exception Handling.	2
6.	4	Create Windows Application Using Msgbox, Input box and using loops.	2

7.	5	Create Windows Application using basic VB.NET controls like button, textbox , labels	2
8.	5	Create Windows Application Combo Box, List Box, Check Boxes, and Option Buttons.	4
9.	5	Create Windows Application Involving Design & use of Menu Strip.	4
10.	5	Create Windows Application to implement Graphics class.	2
11.	6	Create Windows Application for connecting MS Access database.	4
12.	6	Create Windows Application for connecting Oracle database.	4
Total			**32**

SUGGESTED STUDENT ACTIVITIES

1. Develop a mini project on the management system.

SPECIAL INSTRUCTIONAL STRATEGIES

1. Installation of the software VB.Net.

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication (with year)
1.	Programming Visual Basic .NET	Dave Grundgeiger	O'Reilly
2.	The Complete Reference -Visual Basic.NET	Jefrey R. Shapiro	Osborne/McGraw Hill
3.	Programming Microsoft Visual Basic.NET	Francesco Balena	Microsoft Press
4.	Visual Basic .NET Black Book	Steven Holzner	Paraglyph Press
5.	Visual Basic 2017 Made Easy	Dr. Liew	Liew Voon Kiong, 2017

B) Major Equipment/ Instrument with Broad Specifications

- Desktop Computers and LCD Projector
- VB.Net Software, MS Access / Oracle / MySQL.

C) Software/Learning/ Simulations Websites

1. www.tutorialspoint.com/vb.net/
2. http://vb.net-informations.com/
3. https://www.vbtutor.net/
4. http://howtostartprogramming.com/vb-net/

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	2	1	1	1					1	
CO2	1	2	3	2			1		2	
CO3	2	2	1	1					1	
CO4	2	2	1	1					1	
CO5	1	2	3	2			1		2	
CO6	1	2	3	3			1		2	

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE : P. C. MAINTENANCE COURSE CODE: R18CP4403

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	--	@25	50	175

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.

Course Outcomes:

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. Understand the print mechanism and test the printer.
6. Assembling and de-assembly of computer/laptop

Course Details:

UNIT	NAME OF THE TOPIC (with Details)	LEARNING OUTCOMES	HOURS	MARKS
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,SATAconnector,BIOS-basics,mainfunctions, 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).	Identify the different hardware components of computer system. Understand motherboard components Select proper peripheral components for connection Test Motherboard	10	12
2	**2.1 Monitor:** CRT Monitor-Internal structure, Types of Monitor (Monochrome and color), LCD Monitor-Internal Architecture, Types,LCDoperation,Advantages,Disadvantages,TFT-Internal Architecture, LED-Internal structure, Plasma Display-In Monitor Specification and characteristics, Pixel and Resolution, Dot Pitch Horizontal scanning, Vertical	Troubleshoot monitor and display adapter	12	16

	scanning, Raster, and retrace Interlacing, bandwidth **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.			
3	**Keyboard & serial devices:** Detail study of keyboard, (working, Construction, Interfacing Key codes, Key bouncing),Type of Key switches(Membrane, capacitive, Bar types), working (their uses), Keyboard Maintenance and troubleshooting Mouse : Uses of mouse, specification, types of mouse(Optical,opto Mechanical)Maintenance and troubleshooting of Mouse Wireless keyboard and mouse working.	Troubleshoot keyboard and mouse	10	12
4	**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 **4.2 Viruses :** Types of viruses, functioning, Symptoms, Removing viruses using Antivirus software, protecting the PC, Troubleshooting anti-virus tools.	Install software for configuration. Assemble/Disassemble HDD/CD-ROM Identify the computer system hardware and software faults.	12	16
5	**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	Understand the print mechanism of printer. Test printer. Assemble/Disassemble printer.	10	12
6	**6.1 Laptop Basics :** Motherboard, CD/DVD drive, Hard disk, Power supply, LCD Monitor, Card reader, Bluetooth, Wireless adapter, charger, Ports – HDMI, SATA, Specifications 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.	Test motherboard and SMPS. Install all necessary software, configure setup of system.	10	12

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Motherboard and Components	10	4	4	4	12
2	Monitor and Display adapter	12	6	6	4	16
3	Keyboard and serial devices	10	4	4	4	12
4	Disk drives and Viruses	12	6	6	4	16
5	Printers	10	4	4	4	12
6	Laptop	10	4	4	4	12
	Total	**64**	**28**	**28**	**24**	**80**

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

SUGGESTED EXERCISES/PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1	1	To observe the components of motherboard and understand their purposes.	4
2	1	Jumper setting (FSB, CMOS hard disk (master/slave)	4
3	4	CMOS settings.	2
4	1	Back panel and Front panel of CPU.	2
5	1	Post and booting with Beep indicator and error codes.	2
6	4	Disassembly and assembly of HDD.	2
7	4	Disassembly and assembly of CD ROM.	2
8	2	Preventive maintenance and troubleshooting of monitor and display adapter.	4
9	3	Cleaning and maintenance of Keyboard and mouse.	2
10	5	Installation of Print server to access printer through network	2
11	6	Operating system and device driver's installation on Laptop.	4
12	4	Installation of Anti-virus software – configuration, updates, firewall settings.	2
Total			32

SUGGESTED STUDENT ACTIVITIES

1) Assembling and de-assembly of computer/laptop.
2) Guest lecture on assembling and de-assembly of Printer.
3) To submit a report of about 5-10 pages on Manufacturers and cost of Computer, Printers.
4) To submit a report of about 5-10 pages on advanced computer peripherals: specifications, use, and cost.
5) Buying of new computer/laptop (cost, make, model etc.).
6) 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.)

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

SUGGESTED 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, 2nd 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, 5th 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

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**

C) Major Equipments/ Instruments:

Sr No	Name of Component	Quantity
1	Motherboard	1
2	Processor	1
3	CD ROM	1
4	CD	1
5	Keyboard	1
6	Mouse	1
7	Opto mech Mouse Kit	1
8	Optical Mouse Trainer Kit	1
9	Scanner	1
10	PrintertlnkJet)	1
11	Printer(Laser Jet)	1
12	dot matrix trainer kit	1
13	CRT Monitor	1
14	LCD Monitor 16" trainer kit	1
15	HDD SATA	1
16	HDD PATA	1
17	HDD TRAINER	1

18	CMOS Battery	1
19	RAM	1
20	FAN	1
21	Graphics Card	1
22	Card Reader	1
23	Laptop(Mac Notebook)	1
24	SMPS	1
25	SMPS TRAINER KIT	1
26	UPS	1
27	Lan Card	1
28	USB Hub	1
29	Floppy Disc	1
30	DVD	1
31	Pen drive	1
32	PEN DRIVE TRAINER IKIT	
33	ATX Cabinate	1
34	External DVD Writer	1
35	RS232 Cable(DB 9)	1

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	**2**	**1**	**2**	**1**				**1**		**2**
CO2	**3**	**3**	**2**	**1**				**2**		**2**
CO3	**2**	**2**	**3**	**2**				**3**		
CO4	**3**	**3**	**3**	**2**				**3**		**2**
CO5	**3**	**2**	**2**	**1**				**2**		**1**
CO6	**3**	**2**	**2**	**2**				**2**		**1**

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME IN: COMPUTER ENGINEERING

COURSE : LINUX OPERATING SYSTEM **COURSE CODE: R18CP4404**

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	-	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.

Course Outcomes (CO):

The student will be able to

1. Know concept of LINUX file subsystem and process subsystem.
2. Construct appropriate commands for the desired task.
3. Modify File attributes for given purpose and define search patterns.
4. Write Simple Shell Scripts.
5. Write simple AWK programs.
6. Perform System Admin tasks.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
01	**Introduction** 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, emacs	10	12
02	**LINUX Commands I** 2.1 Locating Commands, Internal & External Commands, Arguments, Options & Filenames, Online help 2.2 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.	12	12

	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.	12	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.	10	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

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Introduction	8	4	8	-	12
2	LINUX Commands I	7	4	4	4	12
3	LINUX Commands II	7	4	4	4	12
4	The Shell and Shell Programming	12	4	4	8	16
5	AWK	6	4	4	4	12
6	LINUX Administration	8	4	8	4	16
	Total	48	24	32	24	80

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 for desired task
- Develop shell programs
- Install the Unix/Linux OS
- Observe and interpret the result.

List of Practical/Assignments:

Sr. no.	Unit	Title
1	1	Create documents using vi/ vim editor
2	2	File handling using LINUX commands
3	2	Use of other LINUX commands
4	3	Searching patterns using grep, egrep, fgrep commands
5	4	Use of pipes, redirection and command substitution
6	4	Simple Shell programs
7	5	Simple AWK programs
8	3	View, Grant and modify file access permissions
9	6	Create and manage Users and Groups
10	6	Monitor Disk Usage
11	6	Use of gcc
12	6	Installation of Linux

Professional Practices:

1. Installation of Linux.
2. Use of system administration commands like su, usradd, chgrp, chmod, passwd.
3. Use of Backup commands.

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, 2nd Ed,2007
4	YashawantKanitkar	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

Mapping matrix of CO - PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1-	2	3	3	1					2	
CO2	3	2	1	1		2		1		2
CO3	3	3	2	1						1
CO4	3	3	3				2			2
CO5	3	3	3	1						
CO6	2	2	3	3		1	1	3	2	3

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE : PROJECT AND SEMINAR **COURSE CODE: R18CP4405**

COURSE CATEGORY : APPLIED **CREDIT : 6**

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
	6					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.

Course Outcomes:

The students will able to

i. Work in Groups, Plan the work, and Coordinate the work.
ii. Search for requirements and information.
iii. Develop leadership qualities.
iv. Develop innovative ideas.
v. Practically implement the acquired knowledge.
vi. Develop basic technical Skills by hands on experience

.

Course Details:

Instructions for the selection of topic for Project:

1. Project can be from any of the following subject.
    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/her 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 weightage 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.

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	2	3	3			3				
CO2	3	3	2	2						2
CO3	2	2	2			3				3
CO4	3		2	3				2		
CO5		2	3	3		2		3	3	
CO6				2	3		3	3	2	

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: INDUSTRIAL TRAINING **COURSE CODE: R18CP4406**

COURSE CATEGORY: APPLIED **CREDIT : 6**

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
	6					75	75	150

Rationale:

With the rapidly changing technology students need on field practical knowledge along with the theory subjects they learn.Under this industrial training every student undergoes 6 weeks oftraining at a software firm, networking centre, web developer or work related to Computer Engineering in summer vacation after term end examination of even term of second year. Credits allocated for this course are for awarding marks.

Course Outcomes:

The students will able to

i] Analyze employment environment.
ii] Capture skills acquired during education.
iii] Know career opportunities for professional growth.

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1							2	1		
CO2		2	2	3	2	2	3	2	2	
CO3		2	1				2		1	

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: JAVA PROGRAMMING **COURSE CODE: R18CP5401**

COURSE CATEGORY: SPECIALIZED **CREDIT: 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.

Outcomes:

The students will be able to

1. Understand features of OOPs, Language constructs, JDK toolkit.
2. Write programs using class, objects, methods and constructors.
3. Implement various types of inheritance in programs.
4. Handle exceptions, create and use packages.
5. Create multithreaded programs, use stream I/O, and perform file operations.
6. Design applet and graphics programs.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOMES	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 –	**Understand various language constructs, tools in JDK**	**8**	**12**

	if, if-else, if-else-if ladder, switch-case, Loop statements – for, while, do-while, while, using arrays in 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.	Define class, object and methods Write simple Java programs, compile and run Need of Wrapper classes	**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.	**Understand inheritance and their types,** Write Java programs to implement different types of **inheritance**	**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	**Handle exceptions,** Create packages and add 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	**Understand and write programs to implement multithreading**	**10**	**16**

	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.	**Use different Stream classes for I/O** **Create file and perform various file operations**		
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.	**Write simple applets**	**8**	**12**

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	**Overview Of Java Language**	**8**	**4**	**8**	**--**	**12**
2	**Classes**	**10**	**4**	**8**	**4**	**16**
3	**Inheritance**	**6**	**4**	**4**	**4**	**12**
4	**Exception Handling & Packages**	**6**	**4**	**4**	**4**	**12**
5	**Multithreading & Streams And File I/O**	**10**	**4**	**8**	**4**	**16**
6	**Applets**	**8**	**4**	**4**	**4**	**12**
	Total	**48**	**24**	**36**	**20**	**80**

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

SUGGESTED EXERCISES/PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1	**1**	Programs using objects, control statements and loops	**4**
2	**1**	Use of command line arguments.	**4**
3	**1,2**	Program to accept input from user.	**4**
4	**2**	Program to illustrate use of wrapper classes. Program using Collection interface.	**8**
5	**1**	Program using Collection interface.	**8**
6	**2**	Program using String class and its methods.	**4**
7	**2**	Program to illustrate inheritance.	**4**
8	**2**	1. Program to handle built in exceptions. 2. Program to throw and handle user defined exceptions.	**8**
9	**4**	1. Creation and use of user defined package. Multithreading using Thread class / Runnable Interface	**4**
10	**6**	1. Menu driven program to manipulate files. 2. Storing objects in a file using object serialization.	**8**
11	**3**	1. Simple applet to display messages and graphical shapes. 2. Changing font and background/foreground color of applet.	**8**
Total			**64**

SUGGESTED STUDENT ACTIVITIES

1. Use of software tool such as eclipse.
2. Develop mini project.

SUGGESTED LEARNING RESOURCES

A) Books

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

B) Major Equipment/ Instrument with Broad Specifications

- Desktop Computers and LCD Projector

C) 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

Mapping matrix of PO-PSO's and CO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	1	1				2			2
CO2	3	2	3			2	2			2
CO3	1	2	2							2
CO4	1	2	2							2
CO5	2	2	3	2	2	2	2			2
CO6	1	1	2	2	2		1		2	2

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: MULTIMEDIA TECHNIQUES **COURSE CODE: R18CP5402**

COURSE CATEGORY: SPECIALIZED **CREDIT: 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:

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.

Course Outcomes:

Develop multimedia application by integrating multimedia building blocks.

1. Develop multimedia application by integrating multimedia building blocks.
2. Handle different multimedia devices efficiently.
3. Use appropriate compression technique and file formats to record, edit and use audio, videos.
4. Understand the Operating System support required for multimedia.
5. Understand the network parameters for multimedia applications and QOS.
6. Use different multimedia application software tools.

Course Details:

UNIT	NAME OF THE TOPICs	LEARNING OUTCOME	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,	Understand the basic concepts of Multimedia and storage mediums.	8	16

	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.			
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:** 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.	Understand the use of digital audio in various formats and video technology	**8**	**12**
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	Know the key aspects of multimedia operating systems and compression techniques	**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,	Understand the key aspects of multimedia database and streaming protocols used for online multimedia.	**6**	**12**

	Windows multimedia streaming objects and hierarchy, Streaming bandwidth and storage, Streaming protocols – RTP, RTSP, SDP.			
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.	Understand the requirements and parameters for performance of networks	**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	Understand the software tools used for editing multimedia	**8**	**12**

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Introduction to Multimedia, storage devices and text	8	8	8	--	16
2	Audio and video	8	4	4	4	12
3	Multimedia operating system and compression	10	4	8	4	16
4	Multimedia DBMS and online multimedia	6	4	4	4	12
5	Multimedia networks	8	4	4	4	12
6	Basic software tools ,quick time player and authoring tools	8	4	4	4	12
	Total	48	28	32	20	80

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

SUGGESTED EXERCISES/PRACTICALS

Sr. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1	1	Use of scanner for scanning text, graphics, document scanning	2
2	1	Use of tablets for freehand drawing.	2
3	1,2	Photography using digital camera and web camera/digital camera	2
4	2	Video recording using web camera.	2
5	1	Use of joystick/trackball.	2
6	2	Audio recording using mike and sound forge.	2
7	2	Editing of audio and adding effects using sound forge.	2
8	2	Taking Video clips and Video editing using video editing software	4
9	4	Working with images using Photoshop.	2
10	6	Use of multimedia authoring tool – Director.	2
11	3	Conversion of graphics files from one format to another using compression techniques.	2
12	3	Compression of video and audio using software tools.	2
13	6	Creation of a multimedia application using all the multimedia building blocks.	8
Total			32

SUGGESTED STUDENT ACTIVITIES

3. Use software tools for image/audio/video/animation creation/editing.

SPECIAL INSTRUCTIONAL STRATEGIES (if any)

1. Proper connection, installation of peripheral devices.
2. Proper handling of peripheral devices.
3. Settings on control panel of peripherals.

SUGGESTED LEARNING RESOURCES

A) Books

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# Tay Vaughan	Multimedia Making it Work	Tata MC-Graw Hill, 7th 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

B) Major Equipment/ Instrument with Broad Specifications

- Desktop Computers and LCD Projector

C) Software/Learning/ Simulations Websites

1. Use of sound forge and audacity for audio editing
2. Use of director as authoring tools.
3. Use of video software for video editing

D) 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
4. http://en.wikipedia.org/wiki/Streaming_media

Mapping matrix of PO -PSOs and CO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	1	1	2			2	2	2	2
CO2	2	1	2	1					2	
CO3	3	2	2	2					2	2
CO4	2	2	2	2					2	
CO5	2	2	3	1		2				
CO6	1	1	3	1		2			1	1

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: PHP PROGRAMMING **COURSE CODE: R18CP5403**

COURSE CATEGORY: SPECIALIZED **CREDIT: 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:

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 from database.

Course Outcomes:

The Students will be able to

1. Use data types, variables and different operators in programs.
2. Write programs using conditionals statements, loops and arrays.
3. Use date-time, string functions, write user defined functions and handle the inputs.
4. Use operating system commands, regular expressions and handle errors.
5. Write the programs to demonstrate different file operations.
6. Write the program for storing and retrieving the data from database.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS	MARKS
1	**1.1 Introduction:** What is PHP?, Advantages of PHP : Performance, Scalability, Database Integration, Built in libraries, Cost, Object oriented support, Portability. **1.2 PHP Basics:** Structure of PHP script, Data Types, Variables, printing the values of variables, Constants, comments **1.3 Operators** —General Operations, String operations, Numeric operations--Bitwise, comparison, Logical Operators, operator Precedence.	1a. Introduction to PHP 1.b PHP programming Basics – data types, declaring variables, printing the simple output.	8	12
2	**2.1 Using Conditional statements :** if statement, Nested if statement, - Switch statement, Comparing values, Checking variable content: issett),	2.a Use and write programs using conditional and	8	16

	ernptyt), is_arrayO, is_floatO, is_nullO, isnurnerict), is_stringO **2.2 Using Loops:** for loop, while loop, do-while loop, nested loops, breaking out of a loop. **2.3 Working with Arrays:** Traversing array, using for-each-next, Multidimensional arrays	iterative statements and arrays		
3	**3.1 Using Date and Time:** Setting local time, Formatting Date, Storing Time-stamp in a variable. **3.2 String functions** : Using built in functions: String functions- strlen(), str_word_count(), strrev(), strpos(), str_replace() . **3.3 Functions** : Creating a function, passing values to a function, Passing values by reference, Returning a value from a function, **3.4 Introduction to HTML forms:** Handling User Input With $_ GET(),$_POST().	3.a Use different date-time functions, string functions. 3.b Create user –defined functions 3.c Handle the User Input using get and post methods	8	16
4	**4.1 PHP Error & Exception Handling :** die() function, try, catch, throw **4.2 Regular expression**: Concept, Types- POSIX and PERL Style Regular Expressions Functions: Preg_match(), Preg_split(), Preg_replace() **4.3 Using Operating System Commands:** use of back ticks, system function, exec function, passthru function.	4.a Handle the errors, exception, use regular expressions and operating system commands	8	12
5	**5.1 PHP Include**- Include and require **5.2 PHP File Handling**-open, read, append, write, delete and upload.	5.a Create and perform different operations on files	8	12
6	**6.1 Introduction to Database** Connecting to the database, and creating database using DDL statements-creating table, describe, Alter Table, Drop table, Drop **6.2 Data manipulation statements** - Insert, Delete, Update, and Select.	6.a Create the database using DDL statements and retrieve using DML statements	8	12

SUGGESTED EXERCISES/PRACTICALS

Sr. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1.	1	Create a web page using PHP to display "Welcome" message and to perform basic arithmetic operations.	4
2.	1	Create a web page using PHP to display your information such as name, address.	4
3.	2	Use conditional statements in PHP.	4
4.	2	Use loop statements in PHP.	4
5.	2	Write PHP code to traverse array and display its contents	4
6.	2	Use built in functions for checking variable content in PHP.	4
7.	3	Create a PHP page to display current date and time.	4
8.	3	Write PHP code using string functions.	4
9.	3	Write a function to display your name and address.	4
10.	4	Write a php code to handle the user defined exceptions	6
11.	4	Use regular expressions in PHP.	4
12.	4	Use exec, passthru and backtick commands in PHP.	4
13.	5	Write the PHP program to perform different file operations	4
14.	6	Create a database with PHP to store and retrieve data.	10
		Total	**64**

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1.	PHP basic and operators	8	4	4	4	12
2.	Conditional, iterative statements and arrays	8	4	8	4	16
3.	Date-time ,string, Functions and Forms	8	4	8	4	16
4.	Php error handling, regular expressions and operating system commands	8	4	4	4	12
5.	PHP include and file handling	8	4	4	4	12
6.	Introduction to database ,use of DDL and DML statements	8	4	4	4	12
7.	**Total**	**48**	**24**	**32**	**24**	**80**

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

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

SUGGESTED STUDENT ACTIVITIES

1. Download and install vs. code editor and xampp.
2. Mini projects using PHP.

SPECIAL INSTRUCTIONAL STRATEGIES

i. Arrange expert lecture of an industry expert.

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication (with year)
1	Lerderf,Tatroe & Macintyre	Programming **PHP** (2nd Edition)	O'Reilly Publication
2	David Sklar & Adam Trachtenberg	**PHP** Cookbook!" (2nd Edition)	O'Reilly Publication
3	Ivan Bayross & Sharanam Shah	**PHP** 5.1 for beginners	Shroff Publishers & Distributors Pvt. Ltd.

B) Major Equipment/ Instrument with Broad Specifications

1. Software: XAMPP

2. Editor: VS Code

C) Software/Learning/ Simulations Websites

1. https://www.php.net/
2. https://www.w3schools.com/php/
3. https://www.tutorialspoint.com/php/index.htm
4. https://www.javatpoint.com/php-tutorial
5. https://www.guru99.com/php-tutorials.html

Mapping matrix of PO's and CO's:

Course Outcome	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	1	1						
CO2	1	2	3	2			1		2	
CO3	1	2	3	2			1		2	
CO4	1	2	2	1						
CO5	1	2	2	1						
CO6	1	1	2	1			1		2	

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE -1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: MOBILE COMPUTING **COURSE CODE: R18CP5404**

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:

This Course is introducing the core concepts of mobile network with Mobile Application development. It also includes the Mobile Application Development with Open source operating system like Android OS. Learning this course would improve the employment potential of students in the software development especially Mobile application development

Course Outcomes:

The course content should be taught and learning imparted in such a manner that student are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Explain functioning of different mobile technology.
2. Demonstrate Android activities lifecycle.
3. Execute operation on GUI Objects.
4. Perform event driven programming.
5. Apply various techniques on working with menu.

Course Details:

UNIT	NAME OF TOPIC	LEARNING OUTCOME	HOURS	MARKS
1	Characteristics of mobile communication, Applications of mobile communications, security concern Related to mobile computing, middleware and getaway required for mobile computing, making existing application, mobile enable, mobile IP **1.2 Basic Mobile Computing Protocol** **1.3 Mobile Communication via Satellite:** Low orbit satellite, medium orbit satellite stationary satellite, satellite phones	1) Computing Explain mobile IP and 2) Mobile communication protocol 3) Introduction to mobile computing through telephony	8	16
2	**Overview of Android** What does Android run on- Android	1) Analyze Open source mobile	8	12

	Internals? Android for mobile Apps developments Environment Setup for android apps Development **Framework -** Android-SDK,Eclipse **Emulator –** What is an Emulator?Android AVD,Android Emulation – Creation and setup, First android Application.	technology, Explain Basic of Application development 2) Describe framework, SDK,Emulation 3) Explain Android Application Structure		
3	**Design criteria for Android Application:** Hardware Design Consideration, Design Demands For Android application , Intent, Activity, Activity Lifecycle and Manifest, Creating Application and new Activites. **Simple UI- Layouts and Layout properties:** Introduction to Android UI Design, Introducing Layouts. **XML Introduction to GUI objects viz:** Push Button, Text / labels, Edits Text, Toggle Button , Padding**.**	1) Explain Android Activities lifecycle and UI Layout . 2) Explain Expressions, Manifest, other necessary UI concept 3) List and explain GUI Objects , **4)** Explain Layout Design concepts**.**	**6**	**12**
4	4.1 Event driven Programming in Android (Text Edit,Button clicked etc.) 4.2 Activity Lifecycle of Android	Explain Android Activities driven Programming, Activity Lifecycle, Explain Exception handling.	**10**	**16**
5	Menu: Basics, Custom v/s System Menus, Create and Use Handset menu Button (Hardware) Dialog: Creating and Altering Dialogs Toast: List & Adapters Demo Application Development and Launching Basic operation of SQL lite Database Android Application Priorities	1) Demonstrate working with menu and dialog, Themes, Dialog 2) Perform Demo Application Launching 3) Perform Database operation	**8**	**12**
6	**6.1 Intents and broadcast receivers** Introducing intents: using intents to launch activities, introducing linkify, using intents to broadcast events, 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. **6.2 Using internet resources** Downloading and parsing internet resources, using the download manager, using internet services, connecting to google app engine (google play service or google map service).	1**)** Launch activities 2) Use internet recourses	**8**	**12**
		Total	**48**	

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution Of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Introduction to mobile Computing	**8**	**4**	**6**	**6**	**16**
2	Introduction to android	**8**	**4**	**6**	**2**	**12**
3	Android Activities and GUI Design concepts	**6**	**2**	**4**	**6**	**12**
4	Advanced UI Programming	**10**	**4**	**6**	**6**	**16**
5	Toast , Menu ,List and Adapters	**8**	**4**	**6**	**2**	**12**
6	Intent and broadcast receivers using internet sources	**8**	**4**	**4**	**4**	**12**
	Total	**48**	**22**	**32**	**26**	**80**

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

SUGGESTED EXERCISES / PRACICALS

Sr. No.	Unit No.	Practical Exercises	Appro. Hrs. Required.
1.	2	Installation and setup of java development kit(JDK),Setup android SDK, setup Android IDE ,Setup android development tools (ADT) plugins ,create android virtual device.	6
2.	2	Create "hello World" application. That will display "hello World" in the middle of the screen using Text view widget in the red color.	8
3.	3	Create application for demonstration of android activity life cycle.	6
4.	3	Create Registration page to demonstrate of Basic widgets available in android.	6
5.	3	Create sample application with login module. (Check username and password) On successful login, Change TextView "Login Successful" and on failing login, alert user using Toast "Login fail"	8
6.	4	Create an application for demonstration of Relative and Table Layout in android.	6
7.	4	Create an application that will Demonstrate Button on Click() Event and change the Text View Color based on Button clicked.	6
8.	4	Create an application that will get the Text Entered in Edit Text and display and Text using toast (Message).	6
9.	5	Create an UI such that, one screen have list of all types of Cars. On selecting of any car name, next screen should show car details like: name, launched date, company name	
10.	5	Create an application that will Demonstrate various database operations in Android	12
Total			**64**

Suggested Student Activities

Following is the list of proposed student activities like

1. Design sample GUI(Assume Suitable Details)
2. Prepare and Present presentation on different mobile technologies and on Open Source Technologies
3. Prepare comparison of technical features of different mobile communication technologies being used by popular service providers(such as VSNL, Reliance, Vodafone, Idea, etc.) in your city/town

Special Instructional Strategies

1. Arrange expert lecture on Android Development
2. Case study on latest technology in Mobile development
3. Case study any real time Android application with Design and features

Suggested Learning Resources

A. Books

Sr. No.	Title	Author	Publisher
1	Building Android Apps	IN EASY STEPS	McGraw-Hill Education
2	ProfessionalAndroid2 Application Development	Reto Meier	Wiley India Pvt. Ltd.

B. Major Equipment/ Instruction with Broad Specifications

- Desktop and LCD Projector

C. Software/Learning/Simulations Websites

1. Adobe Flash CS6
2. 3D max

D. Web sites for references:

1. http://www.tutorialspoint.com/android/
2. http://www.tutorialspoint.com/android/android_overview.htm
3. http://www.codelearn.org/android-tutorial/android-introduction
4. http://pl.cs.jhu.edu/oose/resources/android/Android-Tutorial.pdf
5. http://mobisys.in/blog/2012/01/introduction-to-android-aqlite-database/
6. www.appmakr.com/Android
7. www.telerik.com/android-development

Mapping matrix of PO -PSO's and CO's

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1		3	3	3	2					
CO2		2	2	2	2					
CO3	3	2	2	2						2
CO4		2	2	2	2	2		2		
CO5	2	2	2	1	2	2	2	2	2	

CUSROW WADIA INSTITUTE OF TECHNOLOGY, PUNE-1

DIPLOMA PROGRAMME IN: COMPUTER ENGINEERING

COURSE: PYTHON PROGRAMMING **COURSE CODE: R18CP5405**

COURSE CATEGORY: SPECIALIZED **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	-	25	50	175

Rationale:

Introduction to Python Programming course is intended for students with little or no programming experience. It aims to provide students with an understanding of the role computation can play in solving problems and, regardless of their major, feel justifiably confident of their ability to write small programs that allow them to accomplish useful goals.

Course Outcomes (CO):

The student will be able to

- Understand various concepts related to Python
- Select proper operators for desired task
- Develop Python programs
- Install the Python
- Observe and interpret the result.

Course Details:

UNIT	NAME OF THE TOPIC	HOURS	MARKS
01	**Introduction to Python** Features of python, Python get started, Python Syntax, Python comments, Execution of python program, comparison between c and python, Installation and Working with Python, Understanding Python variables, Python data types, Python numbers, Python casting, Python string.	10	16
02	**Python Data Type** Declaring and using Numeric data types: int, float, complex, Using string data type and string operations, Defining list and list slicing, Use of Tuple data type	10	12
03	**Python Program Flow Control** Conditional blocks using if, else and elif, Simple for loops in python, For loop using ranges, string, list and dictionaries, Use of while loops in python Loop manipulation using pass, continue, break and else Programming using Python conditional and loops block	10	12
04	**Python Functions, Modules and Package** Organizing python codes using function, Organizing python projects into modules, Importing own module as well as external modules, Understanding Packages, Powerful Lambda function in python, Programming using functions,	10	12

	modules and external package.		
05	**Python String, List and Dictionary Manipulations** Building blocks of python programs, Understanding string in build methods List manipulation using in build methods, Dictionary manipulation programming using string, list and dictionary in build functions	10	12
06	**Python File Operation** Reading config files in python, Understanding read functions, read(), readline() and readlines(),Understanding write functions, write() and writelines(),programming using file operation	14	16

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Introduction to Python	10	4	4	8	**16**
2	Python Data Type	10	4	4	4	**12**
3	Python Program Flow Control	10	4	4	4	**12**
4	Python Functions, Modules and Package	10	4	4	4	**12**
5	Python String, List and Dictionary Manipulations	10	4	4	4	**12**
6	Python File Operation	14	4	4	8	**16**
		64	**24**	**24**	**32**	**80**

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

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

SUGGESTED EXERCISES/PRACTICALS

Sr. No.	Unit	Title	Remark
1	1	Develop program to use Python variables and data types.	**2**
2	1	Develop program to use of type conversion in Python.	**2**
3	2	Develop program to use the lists and tuples in Python.	**4**
4	3	Develop program to use the loops in python.	**4**
5	4	Develop program to use the functions in python.	**4**
6	5	Develop program to use python strings.	**4**
7	6	Develop program for Python file handling.	**4**
8	6	Develop program for Python read files.	**4**
9	6	Develop program for Python write/create files	**4**
		TOTAL	**32**

SUGGESTED STUDENT ACTIVITIES:

- Mini-Project: Develop a mini project using Python Programming.

SUGGESTED LEARNING RESOURCES:

A) Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	# Dr.Nageswara Rao	Core Python Programming	Dreamtech Press, Second Edition

#. Text Books

B) Major Equipment/ Instrument with Broad Specifications

1. **Operating System :**Windows 10

2. **Software required :**
   a. **Python 3.7.x**
      https://www.python.org/downloads/release/python-371/
   b. **Anaconda : Python 3.7 version**
      https://www.anaconda.com/distribution/

C) Software/Learning/ Simulations Websites

1. https://www.w3schools.com

Mapping of COs and POs, PSOs:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	2	2			1		2	
CO2	1	1	1	1						
CO3	1	1	1	1						
CO4	1	1	1	1						
CO5	1	1	1	1						
CO6	1	2	2	2			1		2	

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: COMPUTER SECURITY **COURSE CODE: R18CP5406**

COURSE CATEGORY: SPECIALIZED **CREDIT: 6**

Teaching and Examination Scheme:

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

Course Outcomes:

The students will able to

i) Identify the need of network security
ii) Know Encryption techniques
iii) Identify role of Digital Signature
iv) Recognize common types of attacks and protect against them.
v) Analyze essential elements of security policies.
vi) Know the cyber law.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS	MARKS
1	**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 .	Understand the types of attacks & importance of security in networking	**9**	**12**
2	**Cryptography :** **2.1** Symmetric Encryption and Message Confidentiality Symmetric Encryption Principles-Model of symmetric Encryption, Cryptography, Cryptanalysis, Types of attacks on	Able to understand the Cryptographic techniques.	**12**	**16**

	Encrypted Messages. **2.2** Cipher –Types of Cipher, Message Authentication- Message Authentication Code (MAC). **2.3** Transposition Techniques- Rotor machines: Enigma, Purple, and Steganography.			
3	**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	Understand the Symmetric & Asymmetric algorithms	**12**	**12**
4	**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	Understand the types of attacks on system & its prevention strategies.	**12**	**12**
5	**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	Understand the types of attacks on Networks & its prevention strategies.	**10**	**12**
6	**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	Understand the types of attacks on Web & its prevention strategies.	**9**	**16**

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Introduction to the Concepts of Security	6	4	8	--	12
2	Cryptography	10	4	8	4	16
3	Symmetric and Asymmetric Infrastructure, Algorithms	8	2	6	4	12
4	System Security	8	4	8	--	12
5	Network Security	8	4	8	--	12
6	Web Security	8	4	12	--	16
	Total	48				80

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

SUGGESTED EXERCISES/PRACTICALS

Sr. No.	Unit No.	Practical Exercises	Approx. Hrs. Required
1	1	Securing a system through registry settings	4
2	1	Securing a system through password policy settings	4
3	5	Implement Virtual Private Network through VMware	6
4	5	Write a program to find an IP address of a remote system	6
5	3,4,5	Case study of Security Monitoring tools.	6
6	4	Case study of Intrusion detection system (IDS)	6
		Total	32

SUGGESTED STUDENT ACTIVITIES

1. Prepare algorithm for developing programs
2. Use of programming language constructs for program implementation

SPECIAL INSTRUCTIONAL STRATEGIES (if any)

1. Various network commands.
2. Present a seminar related to Computer Security technologies and applications.
3. Guest Lecture on Web security/ Forensic Analysis of Windows Registry.

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication (with year)
1	Cryptography and Network Security	#Atul Kahate	TMG,2nd Ed; 2004
2	Cryptography and Network Security Principles and Practices	#William Stallings	PE,5th Ed;2010
3	Principles of Computer Security Security+ and Beyond	Wm.Arthur Conkin, Dwayne Williams, Gregory B. White Roger L.Davis, Chuck Cotheren	TMG,2nd Ed;2004
4	Mike Meyers	COMPAIA A + Guide –PC Technician	TMH, 2007

B) Major Equipment/ Instrument with Broad Specifications

- Desktop and LCD Projector

C) Software/Learning/ Simulations Websites

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

Mapping matrix of PO-PSO's and CO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	1			2			1		
CO2	2	1			2			1		
CO3	2	2	2		2				1	
CO4	2	2			2		1		1	
CO5	3	1		1					1	
CO6	2	1	1	1	1					1

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: ADVANCED JAVA PROGRAMMING COURSE CODE: R18CP5407

COURSE CATEGORY: SPECILAIZED CREDIT: 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	25	150

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.

Course Outcomes:

The students will be able to

1. Use advanced GUI components.
2. Performs storage and retrieval operations on the database.
3. Write client-server programs.
4. Use RMI concept for developing the network applications.
5. Generate HTML page dynamically by using Servlets.
6. Develop software components (Beans) and create the Java Server Pages.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	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.a Use AWT and swing components 1.b Handle the events	10	16

	1.3 Introduction to Swing : The swing package, Swing Heavyweight Vs. Lightweight Components, Swing Features, Model View Controller Architecture.			
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 :** 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.	2.a Use the swing components 2.b Explain ODBC-JDBC	08	12
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.	3.a Know the Basics of Networking, InetAddress Class 3.b Use Sockets in programming	06	12
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.	4.a Describe and use RMI	06	12

	RMI Architecture: RMI and Interface versus implementation, Stubs and skeletons, Bootstrapping and the RMI registry, RMI URL, Exporting remote object.			
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.	5.a Describe and use the 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.	6.a. Introduction to JSP and write simple programs 6.b. Describe EJB	08	12

SUGGESTED EXERCISES/PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Appro. Hrs. Required
1.	1	Programs using AWT components.	2
2.	1	Programs using Layout managers and panels.	2
3.	1	Programs using Action Listener and Item Listener.	2
4.	1	Event handling for key events.	2
5.	1	Handling mouse events.	2
6.	2	Use of swing components.	2
7.	2	Simple programs to access database using JDBC.	2
8.	2	Execution of data base queries using JDBC.	2
9.	3	Simple program to transfer text between client and server socket.	2
10.	3	Program using InetAddress and URL class to access display the contents of a text file.	2
11.	4	Simple programs to illustrate RMI.	2
12.	5	Simple Servlet programs.	2
13.	6	Programs based on Java Beans.	4
14.	6	Simple JSP programs	4
Total			**32**

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1.	The AWT package, Event handling , Introduction to Swing	10	4	8	4	16
2.	Swing Components and Java Database Connectivity	8	4	4	4	12
3.	Network Programming, Communication between client and server	6	4	4	4	12
4.	Java Remote Method Invocation	6	4	4	4	12
5.	Servlet ,Servlet Client Interaction	10	4	8	4	16
6.	Java Beans, JSP	8	4	4	4	12
	Total	**48**	**24**	**32**	**24**	**80**

SUGGESTED STUDENT ACTIVITIES

Following is the list of proposed activities:

1. Gather the information of different frameworks such as spring, hibernate etc.

SPECIAL INSTRUCTIONAL STRATEGIES (if any)

1. Arrange seminar of industry expert in the area of advanced java programming.

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication (with year)
1	# Patrick Naughton-Herbert Schildt	Java Complete Reference – Java 2	Tata Mc Graw Hill Publications, 5th Edition, 2002.
2	# Joseph L Weber	Using Java 2	PHI Eastern Economy Edition, 2002.
3	Jason Hunter	Java Servlet Programming	O'REILLY publications, 2nd Edition, 2001.
4	Steven Holzner et al.	Java 2 (JDK 5 Edition) Black Book	Dreamtech Press, 2006.

- Textbooks

B) Major Equipment/ Instrument with Broad Specifications

- **Desktop Computers and LCD Projector**

C) Software/Learning/ Simulations Websites

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/

Mapping matrix of PO's and CO's:

Course Outcome	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	2	2	3	1			1		1	
CO2	1	2	2						1	
CO3	1	2	2	1					1	
CO4	1	1	2				1		1	
CO5	2	2	3	1			1		1	
CO6	1	2	2	1			1		1	

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME : COMPUTER ENGINEERING

COURSE: ADVANCED COMPUTER NETWORKS COURSE CODE: R18CP5408

COURSE CATEGORY: SPECIALIZED CREDIT: 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	25	150

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.

Course Outcomes:

The students will able to

1. Identify role of WWW architecture entities
2. Categorize telephone network services
3. Configure WLAN network
4. Illustrate role of Frame Relay, SONET, ATM
5. Carry out multimedia communication and observe the characteristics
6. Design cellular network architecture.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS	MARKS
1	**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 1.3Electronic mail – Architecture User Agent: Services, E-Mail Address, Mailing List Message formats –RFC, RFC 822: Headers 1.4MIME: MIME Headers Message Transfer Agent – SMTP Mail Access Agent: POP3, IMAP Web based mail	Understand architecture of World wide web & role of HTTP in WWW.S	8	16

2	**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.Concept of T Lines - T1 Frame, Fractional T Lines Digital Subscriber Line – ADSL – Modulation Technique DMT, HDSL, SDSL, VDSL 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	Understand working of Telephone network & application of telephone network - ISDN	8	12
3	**Wireless LANs** 3.1Introduction, 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 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.	Understand architecture of WLAN & Bluetooth	8	12
4	**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 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 Asynchronous Transfer Mode	Understand Frame relay architecture & SONET along with ATM.	10	16

	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			
5	**Multimedia communication** 5.1Audio 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, ranslation, 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 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	Understand use of Multimedia communication & how it works.	8	12
6	**Wireless WAN** 6.1Cellular telephony – Circuit Switched System – Analog, Digital Cell, frequency-reuse principle, transmission, reception, handover, Roaming, cell splitting, sectoring, microcell zone 6.2First generation – AMPS, Second generation – DAMPS,GSM ,Third generation – CDMA, GPRS, IMT -2000 radio interfaces, Fourth generation, 3GPP, LTE 6.3Satellite networks – applications, orbits, Three categories of satellite – GEO, LEO – Iridium, Globalstar, Teledestic, MEO satellites – GPS, trilateration, synchronization 6.4 Introduction to Wi-MAX, mobile OS and security	Understand Applications of WLAN – Cellular Telephony/Satellite Networks	6	12

SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	World Wide Web and HTTP	8	4	12	--	16
2	Telephone Networks	8	4	8	--	12
3	Wireless LANs	8	4	8	--	12
4	Frame Relay	10	4	12	--	16
5	Multimedia communication	8	4	4	4	12
6	Wireless WAN – Cellular Telephony/Satellite Networks	6	4	8	--	12
	Total	**48**	**24**	**32**	**4**	**80**

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

SUGGESTED EXERCISES/PRACTICALS

Sr. No.	Unit No.	Practical Exercises	Appro. Hrs. Required
1	**1**	Web server Configuration.	**4**
2	**1**	Proxy server Configuration.	**4**
3	**3**	Implementation of Wireless LAN on network simulator.	**4**
4	**3**	Setup of WLAN network with Access point and transfer of information.	**4**
5	**6**	Implementation of Wi-MAX on network simulator.	**4**
6	**6**	Design and implementation of cellular network on network simulator.	**4**
7	**1**	Study of different protocols using network simulator.	**4**
8	**1&3**	Monitor the performance of network link utilization and throughput on network simulator.	**4**
Total			**32**

SUGGESTED STUDENT ACTIVITIES

1. Surveying of suitable network component for networking.
2. Make proper connection for networking.
3. Interpret various networking commands
4. Installation of software

SPECIAL INSTRUCTIONAL STRATEGIES

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).

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication (with year)
1	Data communication and networking (2^{nd} edition) Data communication and networking (4^{th} edition)	# Behrouz A. Forouzan	TMG, 2nd Ed; 2003 TMG, 4th Ed; 2008
2	Computer Networks	# Andrew S. Tanenbaum	PHI,4^{th} Ed;2002
3	Mobile Communications	Jochen Schiller	PE,2^{nd} Ed;2003
4	Data and Computer communications	William Stallings	PHI,8^{th} Ed;2006
5	Multimedia Communications	Jerry D. Gibson	Harcourt India, Imported Edition; 2006

B) Major Equipment/ Instrument with Broad Specifications

1. Use of Switch & Router in Networking Lab

C) Software/Learning/ Simulations Websites

1. Network Simulator and Emulator

D) 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/

Mapping matrix of PO-PSO's and CO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1		1						2	
CO2	1	1		1						
CO3	1	1	1	3		1		1		
CO4	1	1							1	
CO5	1	1		3			1			
CO6	1		2	2					1	

CUSROW WADIA INSTITUTE OF TECHNOLOGY PUNE-1

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: ANIMATION TECHNIQUES **COURSE CODE: R18CP5409**

COURSE CATEGORY: SPECIALIZED **CREDIT: 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.

Course Outcomes:

The Students will be able to

1. Handle flash tool effectively
2. Work with drawing tools.
3. Create frames and layers.
4. Work with audio and video importing in animation
5. Create simple animation using action script.
6. Publish flash files.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	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.**	Demonstrate the understanding the computer graphics	3

	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.		
2	2.1 **Drawing tools :** Pen tool, Text tool, Line tool, Rectangle tool, Pencil tool, Brush tool, Deco tool, Bone tool, Paint Bucket tool, Eyedropper tool, Eraser tool. 2.2 **Using Colors :** Creating gradients, Using opacity of gradients, Creating custom colors, Adding filters. 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.	Students are able to handle flash tool effectively	3
3	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. 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. 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.	Students care able to create simple animation	03
4	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. 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	Work with audio and video importing in animation	02

	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.		
5	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. 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.	Students are able to create simple interactive animation using action script	03
6	**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.	Students are able to publish and make animation available in different formats	02

SUGGESTED EXERCISES/PRACTICALS

Sr. No.	Unit No.	Practical Exercises	Appro. Hrs. Required
1	2	Create a simple flash document and set its properties, and use basic drawing tools.	6
2	2	Create a frame by frame animation using blank key frames.	8
3	2	Create a motion tweened animation using path, layer.	6
4	3	Create an animation using shape tweening.	6
5	3	Create animation graphics, movie symbol.	6
6	4	Working with sound in the animation.	8
7	4	Working with video in the animation	6
8	5	Create an interactive animation using Buttons and Navigation Action Script.	6
9	5	Create a simple animation using Action Script control statements.	12
Total			**64**

SUGGESTED STUDENT ACTIVITIES

1. Prepare storyboard for developing animation.
2. Use software tools to design animation.
3. Select appropriate tools for animation design.

SPECIAL INSTRUCTIONAL STRATEGIES (if any)

1. Search information from various sources .
2. Innovation.

SUGGESTED 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.

B) Major Equipment/ Instrument with Broad Specifications

- Adobe Flash CS6 and 3D max

C) Software/Learning/ Simulations Websites

1. http://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/*
5. *http://* www.flashanimation.com/

Mapping matrix of PO-PSO's and CO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	2			1	
CO2	2	2	2	2	2	1			2	
CO3	2	2	2	2	2	2			2	1
CO4	2	2	2	2	2	2	2		2	2
CO5	2	2	2	2	2	2	2		2	2
CO6	2	2	2	2	2	2	2		2	2

DIPLOMA PROGRAMME: COMPUTER ENGINEERING

COURSE: NETWORK ADMINISTRATION **COURSE CODE: R18CP5410**

COURSE CATEGORY: SPECIALIZED **CREDIT: 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 2016 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.

Course Outcomes:

The students will able to

1. Perform Windows 2016 Server installation
2. Apply security strategies using group policy
3. Prepare and manage the disks
4. Configure server environment using active directory
5. Implement domain environment
6. Assign static and dynamic IP address and carry out backup strategy.

Course Details:

UNIT	NAME OF THE TOPIC	LEARNING OUTCOME	HOURS
1	**The Windows Server 2016 Environment** 1.1 The Windows Server 2016 family and key features, Hardware requirements, Installation of Windows Server 2016 1.2 Architecture of Windows Server 2016, 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	Able to install Windows Server 2016	2

2	**Managing Access to Resources** 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 2.2 Configuring Group Policy Settings, Assigning Scripts with Group Policy, Restricting Group Membership and Access to Software Planning group policy strategy, creating Group Policy Objects GPOs	Apply group policy	3
3	**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 2016, Using Security templates to Secure Computers, Testing Computer Security Policy Managing Disks 3.3 Preparing Disks, Managing Disk Properties, Mounted Drives, Converting disks, Volumes, Initialize and partition a disk	Design and implement security policies	3
4	**Windows Server 2016 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,subnettig TCP/IP networks, calculating number of subnets IP Routing 4.4 Understanding IP routing, How routing works, Route tables, Types of routing – Static, Dynamic	Design network with IP address and subnetwork.	3
5	**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 5.2 Domain Name System Understanding DNS, DNS and the internet, DNS and Windows Server 2016, Dynamic DNS Working of DNS, Installation and configuration of DNS server, Creating DNS zones – forward lookup and reverse lookup zone	Design and set policies of active directory.	3
6	**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	Assign IP addresses through DHCP and plan backup and recovery strategy	2

SUGGESTED EXERCISES/PRACTICALS

Sr. No.	Unit No.	Practical Exercises	Approx. Hrs. Required
1	1	Installation of Windows Server 2016	4
2	1	Creation of local users and group and implementation of its properties.	4
3	4	Configuration of TCP/IP network i) Assign IP Address ii) Verify IP Communication	2
4	4	Configuration of Router	2
5	1&2	Installation of Virtual Operating System through VMware	4
6	1&2	Implementation of local, roaming, hardware profile	4
7	5	Installation and verification of Active Directory i) Domain Controller. ii) NetBIOS Domain Name. iii) Permissions. iv) Verifying the Installation. • Event Viewer • Event Log	4
8	5	Installation of Domain Name System. i) DNS Namespace ii) DNS Zones	4
9	5	Active Directory users and components implementation. i) Creating a user/Computer. ii) Properties. iii) Testing from Client. iv) Joining a Domain.	4
10	2	Creation and management of OU structure.	4
11	2	Applying Group policies to OU.	4
12	5	Applying security to Active Directory objects using Group Policy Object Editor.	4
13	6	Installation and implementation of DHCP. i) Authorizing DHCP for Active Directory. ii) Creating and managing DHCP Scopes.	4
14	6	Management of Disk and Disk Quota entries. i) Preparing Disk ii) Creating Volumes	4
15	--	Implementation of Telnet.	4
16	--	Installation and implementation of Remote Desktop.	4
17	6	Implementation of Backup and Recovery Strategy.	4
		Total	**64**

SUGGESTED STUDENT ACTIVITIES

1. Mini project in group.
3. Surveying of suitable network component for networking.
4. Make proper connection for networking.
5. Interpret various networking commands
6. Installation of software

SPECIAL INSTRUCTIONAL STRATEGIES

1. Guided Industrial visit.

SUGGESTED LEARNING RESOURCES

A) Books

Sr. No.	Title of Book	Author	Publication (with year)
1	Administering Windows Server 2016	# Orin Thomas	Microsoft Press
2	Mastering Windows Server 2016 R2	Mark Minasi, Kevin Greene, Christian Booth, Robert Butler, John McCabe, Robert Panek, Michael Rice, Stefan Roth	Wiley / Sybex
3	Installing and Configuring Windows Server 2016	Mitch Tulloch	Microsoft Press

B) Major Equipment/ Instrument with Broad Specifications

1. Use of Switch & Router in Networking Lab

C) Software/Learning/ Simulations Websites

1. Use of different network simulator tools like GNS3 to draw network structure.

D) Web sites for references:

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

Mapping matrix of CO-PO's and PSO's:

Course Outcome	Program Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2		3	2			2		
CO2	1	2	3	2	1	2			2	1
CO3	2		2	2	1					
CO4	1	1	2	3	2	1		2		2
CO5	2		2	1	2				2	
CO6	2	2	1	3		1			1	2