AUTONOMOUS NANDYAL-518501, KURNOOL DIST., A.P., INDIA

# **INFORMATION TECHNOLOGY**



ESTD: 1995

# B.TECH SYLLABUS 2015

Applicable for students admitted into B.Tech (Regular) from 2015-16

**REGULATIONS, COURSE STRUCTURE & DETAILED SYLLABUS** 

### Autonomous SCHOOL OF INFORMATION TECHNOLOGY

### (Affiliated to J.N.T.U.A, Anantapuramu) ACADEMIC REGULATIONS,COURSE STRUCTURE AND DETAILED SYLLABI B.Tech. (Regular) from 2015-16 and B.Tech.(Lateral Entry Scheme) from 2016-17

For pursuing four year Bachelor Degree Program(under graduate) of study in Engineering (B.Tech.),Two year Master (post graduate) Degree of study in Engineering (M.Tech.),Two year Master (post graduate) degree of study in Business Administration (MBA), Three year Master (post graduate) Degree of study in Computer Applications (MCA) offered by Rajeev Gandhi Memorial College of Engineering and Technology, Nandyal -518501 under Autonomous status and herein referred to as RGMCET (Autonomous):

All the rules specified herein approved by the Academic Council will be in force and applicable to students admitted from the Academic Year 2015-16 onwards. Any reference to "Institute" or "College" in these rules and regulations shall stand for Rajeev Gandhi Memorial College of Engineering and Technology (Autonomous).

All the rules and regulations, specified hereafter shall be read as a whole for the purpose of interpretation. As and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, the Principal, Rajeev Gandhi Memorial College of Engineering and Technology shall be the Chairman, Academic Council.

The candidate seeking admission into the first year of study of four year B.Tech. degree Program should have:

- i) Passed either Intermediate Public Examination (IPE) conducted by the Board of Intermediate Education, Andhra Pradesh with Mathematics, Physics and Chemistry as optional subjects (or any equivalent examination certified by Board of Intermediate Examinations) or a Diploma in Engineering in the relevant branch conducted by the Board of Technical Education, Andhra Pradesh (or any equivalent examination certified by State Board of Technical Education) for admission.
- **ii)** Secured a rank in the EAMCET examination conducted by AP State Council for Higher Education (APSCHE) for allotment of a seat by the Convener, EAMCET, for admission.

### Admission Procedure:

As per the norms of A.P. State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made to the first year of Four year B.Tech. Degree program as follows:-

- **a)** As per the norms of Government of Andhra Pradesh, A-Category (based on the rank obtained in EAMCET) seats will be filled by the Convener, EAMCET.
- **b)** As per the norms of Government of Andhra Pradesh, B-Category seats will be filled by the management.

### Admission to the Second year of Four year B.Tech. Degree Program in Engineering:

- i) Candidates qualified in ECET and admitted by the Convener, ECET, in such cases for admission, when needed permission from the statutory bodies is to be obtained.
- **ii)** 20% of the sanctioned strength in each program of study (of RGMCET) shall be filled by the Convener, ECET as lateral entry.

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### List of Programs offered

- 1. B.Tech. Regular (& Lateral Entry)
- 2. M.Tech. Regular
- **3.** MBA Regular
- **4.** MCA Regular

### Academic Regulations for 2015 B. Tech. (Regular)

(Effective for the students admitted into the I year from the Academic Year 2015-2016)

The B.Tech.be conferred by the Jawaharlal Nehru Technological University Anantapur, Anantapuramu students who are admitted to the program and fulfill all the requirements for the award of the Degree as specified below:

### 1.0 Award of B.Tech. Degree

- **1.1** The student will be declared eligible for the award of the B. Tech. degree if he fulfils the following academic regulations:
- **1.2** Pursued a course of study for not less than prescribed course work duration and not more than double the prescribed course work duration.
- **1.3** Registered for 200 credits and secured a minimum of 194credits with compulsory subjects as listed in Table-1 below.

	Table 1: Compulsory Subjects					
S. No.	SUBJECT PARTICULARS					
1	All the first year subjects					
2	All practical subjects					
3	All Skill Development Courses/ value added courses					
4	Mini project					
5	Seminar					
6	Comprehensive viva - voce					
7	Project work					
8.	Extra Academic Activities(EAA)					

### 2.0 Forfeit of seat

Students, who fail to fulfill all the academic requirements for the award of the degree within **<u>eight academic years</u>** from the year of their admission, shall forfeit their seat in B.Tech. Course.

### 3.0 Courses of study

The following courses of study are offered at present as specializations for the B.Tech. Course:

- 1. Civil Engineering
- 2. Computer Science and Engineering
- 3. Electrical and Electronics Engineering
- 4. Electronics and Communication Engineering
- 5. Information Technology
- 6. Mechanical Engineering

and any other course as approved by the authorities of the University from time to time.

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	Semester						
Subject	Periods/	Cradita	Internal	External			
	Week	Creans	Marks	Marks			
Theory	3+1*	03	30	70			
Practical/Mini project	03	02	25	50			
Drawing	03	03	30	70			
Skill Development Courses/Value	1+0*	01**	100				
Added Course	1 ' 2	01	(30 IM + 70 EM)				
EAA (Extra Academic Activities)	02	01	00	00			
Seminar		01	50				
Comprehensive Viva-voce		02		50			
Project		08	50	100			

### **Table 2: Credits**

### [\*Tutorial

\*\*[Skill Development Courses / value Added Course credits will not be considered for the award of division. However all these courses have to be cleared through internal evaluation by scoring minimum of 40%marks.EAA courses will not have any marks. The credits obtained in Skill development courses and EAA will be taken in to account for the award of degree.]

### 4.0 Distribution and Weightage of Marks

- **4.1** The performance of the student in each semester shall be evaluated subject –wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition, mini-project, comprehensive viva, seminar shall be evaluated for 50 marks each and the project work shall be evaluated for 150 marks.
- **4.2** For theory subjects the distribution shall be 30 marks for Internal Evaluation(25 marks for Internal test and 05 marks for assignments or field work/group task) and 70 marks for the End-Examination.
- **4.3** During the semester there shall be 2 tests for theory subjects. In each Internal test there shall be one compulsory (short answers) question and 3 descriptive questions are to be answered. The duration of internal test will be for 2hours. First test to be conducted in 3 units and second test to be conducted in the remaining 3 units of each subject. For awarding of 25Internal marks the performance of the student in two Internal examinations conducted one in the middle of the semester and the other towards the end of the semester giving a weightage of 0.75 for the better score and 0.25 for the other score will be considered. There shall be two assignments in each subject (problem based/ field work/group task) for award of 05 marks so that internal component (marks) will be 30 marks (25 marks for internal test+05 marks for assignments / field work/group task).

Table 3:Units for Internal Tests						
Semester						
3 UnitsFirst Internal test.						
3 UnitsSecond Internal test.						

**4.4** In the case of Skill Development Courses, two Internal examinations shall be conducted one in the middle of the semester and the other at the end of the semester for 30 marks and the marks scored by the student in these exams with a weightage of 0.75 for better score and 0.25 for the other score will be

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awarded as Internal marks for 30. For the remaining 70 marks an end examination will be conducted along with other theory examinations. However skill development courses/Value added courses, end examination will be evaluated internally.

- **4.5** No makeup test for internal examination or assignments/group tasks will be conducted in any subject or practical. The student, who is absent for any test shall be deemed to have scored zero in that test.
- **4.6** Elective subjects will commence from 3<sup>rd</sup> year second semester onwards. Out of the electives offered in 3-2 semester, one elective will be MOOC/Elective offered by the department. Any student who is interested can opt for the MOOC/Elective offered by the department and acquires the required credits. Even if the student opts MOOC, he has to write two internal tests besides the end examination conducted by the institute like other subjects. However, he has to obtain the certificate from the organization in which he has registered. Any MOOC selected by the student should be of more than 45 hours duration and also from the reputed organization. Attendance of the student who has opted for MOOC will be taken from the remaining subjects and labs only in that semester while finalizing the attendance for fulfilling the minimum requirements of attendance for promotion to next semester. Attendance will not be recorded for MOOC.
- **4.7** Gap Year Concept of student Entrepreneur in Residence shall be introduced and outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time after I/II/III year to pursue entrepreneurship full time. This period may be extended to two years at the most and these two years would not be counted for the time for the maximum time for graduation. An evaluation committee shall be constituted with to evaluate the proposal submitted by the student and committee shall decide on permitting the student for having the Gap Year. The committee consists of Principal as Chairman and all HODs as members.
- **4.8** In the electives offered in 4-1 semester, one elective will be open elective offered by the other department (inter department). Student has to select one subject among the offered list of open elective subjects. Student has to clear the subject as per norms to get the required credits. At least 40students should register for any open elective; otherwise that open elective will not be offered.
- **4.9** Out of the electives offered in 4-2 semester again one elective will be based on MOOC/ elective offered by the department and the student has to acquire the required credits to clear the subject as specified in 4.9.
- 4.10 The institute would like to offer Minor as optional feature of the B.Tech. program aimed at providing additional learning opportunities for academically motivated and bright students. In order to earn a Minor, a student has to earn a minimum of 20 extra credits. For this in addition to the regular subjects, a student has to pursue three compulsory subjects from 3-1 semester and two electives (out of six electives offered from 3-2 Semester onwards). The Minor is indicated by separate CGPA and is reflected in the degree certificate as for example, B.Tech in ECE with Minor in Artificial Intelligence. Each department shall offer at least one Minor. The student has to select the subjects which are not

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studied in their regular course and student should have cleared all the subjects upto and including 2-2 semester with above 60% of marks to become eligible for Minor. The breakup of the credits are 5 subjects which carry 15 credits @3 credits for subject and project work carries 5 credits. The evaluation pattern of subjects and project work will be similar to methods followed in regular course evaluation. No attendance minimum will be considered for Minor. Not more than two subjects are allowed for registration in any semester.

4.11 Extra - Academic Activity (EAA)

Each of the following activities carry one credit and every student is required to register for **two activities** during second year of study which is mandatory.

- a) NSS/NCC
- **b)** Games and Sports
- c) Yoga/Meditation
- **d)** Extension Activities
- e) Literary/ Cultural Activities

Any other which may be offered in future

The activities shall be carried out in the allotted hours. The activities will be monitored by the respective faculty in charge, senior faculty member of the department and the HOD. Grades will be awarded on the basis of participation, attendance, performance and behaviour. Grades shall be entered in the marks statement as GOOD, SATISFACTORY and UNSATISFACTORY and shall not be counted towards CGPA calculation. If any student gets an Unsatisfactory Grade, he/she has to repeat the activity in the immediate subsequent year.

### 5.0 Question Paper Pattern

- **5.1** Each Internal Test question paper shall contain 5 questions, of which the First question is compulsory and three questions are to be answered from the remaining four. Compulsory question carries 10 marks (It contains 5 questions of two marks no choice in first question). The remaining 3 questions carry 5 marks each. Each question shall have a,b,c.... parts.
- **5.2** The End Examination question paper will have 7 questions and students have to answer5 questions. However, the first question is compulsory and it consists of 7 short answer questions, each carrying 2 marks. The next 4 questions are to be answered from the remaining 6 questions and each carries 14 marks. Each 14 marks question shall have a, b, c ...parts.
- **5.3** For practical subjects, there shall be a continuous evaluation during the semester for 25 Internal marks and End Examination carries 50 marks. Of the 25 marks for Internal, 20 marks shall be awarded for day-to-day work and 5 marks to be awarded by conducting an internal laboratory test. The End Examination shall be conducted by the teacher concerned and an external Examiner from other institutions.
- **5.4** For the subject having design and/or drawing, (such as Engineering Graphics, Machine Drawing etc.) and estimation, the distribution shall be 30 marks for Internal evaluation (15marks for day-to-day work and 5 marks for

Internal tests and 10 marks for assignments) and 70 marks for End Examination. There shall be two internal tests in a Semester and the better of the two shall be considered for the award of marks for internal tests.

- **5.5** The Engineering drawing, wherever offered is to be treated as a theory subject. Evaluation method adopted for theory subjects shall be followed here as well.
- **5.6** There shall be mini-Project, in collaboration with an industry(wherever possible) of their specialization, to be taken up during the vacation(data collection, components etc.) after III year II Semester examination and implementation/simulation shall be carried out in IV year first semester during lab classes. Implementation or fabrication/simulation of mini project will be treated as laboratory. However, the mini project and its report shall be evaluated in IV year I Semester. The mini project shall be submitted in report form and should be presented before the committee, which shall be evaluated for 50 marks. The committee consists of an external Examiner, Head of the Department, the supervisor of mini project and a senior faculty member of the Department. There shall be 25 internal marks for mini project which will be awarded based on the performance and involvement of the student during mini project period.
- **5.7** There shall be a seminar presentation in IV year II semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the Department, which shall be evaluated by the Departmental committee consisting of Head of the Department, seminar supervisor and a senior faculty member of the department. The seminar report shall be evaluated for 50 marks. There shall be no external examination for seminar.
- **5.8** There shall be a comprehensive viva voce examination at the end of IV year II semester for 50 marks which shall be conducted by HOD, senior faculty and external Examiner from other institute.
- **5.9** The project topic should be approved by Internal Department Committee (IDC). Out of total 150 marks for the project work, 50 marks shall be for Internal Evaluation and 100 marks for the End Semester Examination. The evaluation of project work shall be conducted at the end of the IV year II semester. The project viva voce examination will be conducted by the committee consisting of an external Examiner from other institute, Head of the Department and the supervisor of the project. The Internal evaluation for 50 marks shall be on the basis of two seminars given by each student on the topic of the project. The Internal evaluation of the Department or his nominee, senior faculty member and the supervisor of project.
- **5.10** For all practical /mini project/main project/comprehensive viva-voce etc the HOD of the concerned dept shall submit a panel of 4 external examiners from different institutes and one will be selected by the Chief Superintendent of the Examination for conducting of end examination.

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### Table4: Distribution of weightages for examination and evaluation

S1. No.	Nature of subject	Marks	T and	ype of examination I mode of assessment	Scheme of Examination
		70		End Examination Double Evaluation (Internal + External evaluation)	End Examination in theory subjects will be for 70 marks.
1	Theory	30	25	Internal Examinations (Internal evaluation)	These 25 marks are awarded to the students based on the performance in two(semester)Internal examinations with a weightage of 0.75 for better score and 0.25 for the other score.
			05	Assignments/Field work/group task (Internal evaluation)	Average of two assignments/Field work/group task in a semester each evaluated for 05 marks.
		50	End (Exte	lab examination ernal evaluation)	This End Examination in practical subjects will be for a maximum of 50 marks.
2	Practical	05	20	Internal evaluation	Day-to-day performance in lab experiments and record
		25	05	Internal evaluation	Internal lab examination at the end of year/semester
3	Mini Project	50	End (Exte	Examination ernal evaluation)	This End Examination in miniproject will be for a maximum of 50 marks.
		25	Inter	nal evaluation	Day-to-day performance in executing mini project.
4	Seminar	50	Internal evaluation		Based on the performance in two seminars during semester
5	Comprehensiv e Viva	50	Exte	rnal evaluation	This end viva voce examinations in all the subjects for 50 marks
		100	Exte	rnal evaluation	This end viva voce in project work for 100 marks
6	Project work	50	Internal evaluation		These 50 marks will be based on the performance of the student in the project reviews apart from attendance and regularity
7	Skill Development Courses/ Value Added Course/ Mock interviews and	30	Internal evaluation		These 30 marks are awarded to the students based on the performance of two Internal examinations with a weightage of 0.75 for better score and 0.25 for the other score.
	Group Discussion	70	Inter	nal Evaluation	Based on the performance in the end examination.
8	EAA	00	Inter	nal evaluation	Based on performance and committee report.

### 6.0 Attendance Requirements:

**6.1** The student shall be eligible to appear for End examinations of the semester if he acquires a minimum of 75% of attendance in aggregate of all the subjects of that semester.

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- **6.2** Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in a semester may be granted by the College Academic Committee.
- **6.3** The student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester. They may seek readmission for that semester when offered next.

## 6.4 Shortage of Attendance below 65% in aggregate shall in <u>NO</u> case be condoned.

- **6.5** Students whose shortage of attendance is not condoned in any semester are not eligible to take their End Examination of that class and their registration shall stand cancelled.
- **6.6** The stipulated fee shall be payable towards condonation of shortage of attendance.

### 6.7 The attendance in each subject will be recorded in the Marks memo.

### 7.0 Minimum Academic Requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item No.6.0.

- **7.1** The student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical or design or drawing subject or Skill Development Coursesor project if he secures not less than 35% of marks in the End Examination and he has to score minimum of 40% marks from Internal and external exam marks put together to clear the subject.
- **7.2** The student shall be promoted from II to III year only if he fulfils the academic requirement of securing a minimum of 51credits out of 102credits from all the exams conducted up to and including II year II semester regular examinations irrespective of whether the candidate takes the examination or not.
- **7.3** The student shall be promoted from third year to fourth year only if he fulfils the academic requirements of securing minimum of 76 credits out of 152credits from all the exams conducted up to and including III year II semester regular examinations ,whether the candidate takes the examinations or not.

Table 5. Tromotion fulles							
Promotion from	Total credits to register	Minimum credits to obtain for promotion					
II yr to III yr	102	51					
III yr to IV yr	152	76					

**Table 5: Promotion rules** 

- **7.4** The student shall register and put up minimum attendance in all 200 credits and earn a minimum of 194credits.Marks obtained in the best186credits(excluding the credits obtained in Skill Development Courses/VAC/Mock interviews and GD and EAA) shall be considered for the calculation of percentage of marks.
- **7.5** Students who fail to earn 194 credits as indicated in the course structure including compulsory subjects as indicated in Table-1 within eight academic

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years from the year of their admission shall forfeit their seat in B.Tech. Course and their admission shall stand cancelled.

#### 8.0 Course pattern:

- **8.1** The entire course of study is of four academic years. Each academic year consists of two semesters
- **8.2** The student is eligible to appear for the End Examination in a subject, but absent at it or has failed in the End Examination may appear for that subject at the supplementary examination.

Year	Semester	No. of S	No. of Subjects		Number of Labs		Total cre	edits		
First year	First	CE/ME/ CSE 06 {ENG-I, M-I, EP, MEC,CP, CORE-1}	ECE/ EEE/ IT 06 {ENG-I M-I, ED, CP, EP, CORE-I}	00	CE/ ME/ CSE EC lab, CP lab, EWS, ELCS	ECE/ EEE/ IT EP Lab, CP lab, ITWS, Core1 lab	6X3=18 4X2=08	26		
	Second	06 { Eng-II M-II, SSP/MP, DS, ED, CORE-II}	06 { Eng-II M-II, SSP, MEC, DS, CORE-II}	00	EP lab, DS Lab, ITWS Core-II lab	EC lab, DS lab, EWS, Core-II Lab	6X3=18 4X2=08	26		
Second	First	06		01	Subjects SDC/VAC Labs		Subjects SDC/VAC Labs		6X3=18 1X1=01 3x2=06	25
year	Second	C	)6	01	Subjects SDC/VAC Labs		6X3=18 1X1=01 3X2=06	25		
	First	c	)6	01		Subjects SDC/VAC Labs	6X3=18 1X1=01 3X2=06	25		
Third year	Second	04+01 Elective 01-MOOC/Elective		01	мо	4X3=12 1X3=03 1X3=03 1X1=01 3x2=06	25			
	First	05+Open Elective		01	O Mock Int	5X3=15 1X3=03 1X1=01 2X2=03 1X2=03	25			
Fourth year	Second	01+El MOOC/	ective+ Elective	01	MO Compre	Subjects Elective OC/Elective SDC/VAC Seminar hensive Viva Project Viva EAA	1X3=03 1X3=03 1X3=03 1X1=01 1X1=01 1X2=02 1X8=08 2X1=02	23		
			GRAN	D TOTAL				200		

#### Table: 6: Course pattern

### 9.0 Transitory Regulations:

Candidates who have been detained for want of attendance or not fulfilled academic requirements or who have failed after having undergone this course in earlier regulations or have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered subject to section 2.0 and they continue to be in the academic regulations in which they were readmitted.

### 10.0 With-holding of results:

If the candidate has any dues not paid to the Institute or if any case of indiscipline of malpractice is pending against him, the result of the candidate shall be withheld and he will not be allowed/promoted into the next higher semester. The issue of degree is liable to be withheld in such cases.

### 11.0 Award of Class:

After the student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. degree he shall be placed in one of the following four classes:

Class	% of marks to be	Division/	CGPA	
Awarded	secured	Class		From the
First Class with Distinction	70% and above	First class With Distinction	≥ 7.5	aggregate marks secured for
First Class	Below 70% but not less than 60%	First Class	6.5 and < 7.5	the best 186 Credits (excluding
Second Class	Below 60% but not less than 50%	Second Class	$\geq$ 5.5 and < 6.5	Skill Developme
Pass Class	Below 50% but not less than 40%	Pass	$\geq$ 4 and < 5.5	nt Courses, EAA)

**Table 7: Award of Division** 

(The marks in internal evaluation and End Examination shall be shown separately in the marks memorandum)

### 12.0 Grading:

After each subject is evaluated for 100 marks, the marks obtained in each subject will be converted to a corresponding letter grade as given below, depending on the range in which the marks obtained by the student falls.

Table 8:	Conversion	into	Grades	and	Grade	points	assigned
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Range in which the % of marks in the subject fall	Grade	Grade point Assigned	Performance
90 to 100	0	10	Outstanding
80 to 89.9	A+	09	Excellent
70 to 79.9	А	08	Very Good
60 to 69.9	B+	07	Good
50 to 59.9	В	06	Above Average
45 to 49.9	С	05	Average
40 to 44.9	Р	04	Pass
<40	F	00	Fail
Ab	AB	00	Fail

- **12.1** Requirement for clearing any subject: The students have to obtain a minimum of 35% in End Examination and they have to score minimum of 40% marks from Internal and external exam marks put together to clear the subject. Otherwise they will be awarded fail grade.
- **12.2** F is considered as a fail grade indicating that the student has to reappear for the end supplementary examination in that subject and obtain a non fail grade for clearing that subject.
- 12.3 In case of skill development/ value added course / soft skill subjects, as there is no end exam, all 100 marks are for internal assessment only. Student has to score 40% in these courses to complete the subject which will be evaluated internally. Marks obtained in these courses shall not be considered for award of Division.
- **12.4** To become eligible for the award of degree the student must obtain a minimum CGPA of 4.0

### **13.0** Supplementary Examinations:

Apart from the regular End Examinations, the institute may also schedule and conduct supplementary examinations for all subjects for the benefit of students with backlogs. Such students writing supplementary examinations as supplementary candidates may have to write more than one examination per day. The student is not permitted to improve his performance in any subject in which he has obtained pass grade.

### 14.0 Grade Point Average (GPA) and Cumulative Grade Point Average(CGPA)

The Grade Point Average (GPA) for each semester and Cumulative Grade Point Average (CGPA) up to any semester are calculated as follows:

i) Semester Grade Point Average will be computed as follows:

$$GPA = \frac{\sum_{i=1}^{n} C_i \times GP_i}{\sum_{i=1}^{n} C_i}$$

Where, n is the number of subjects in that semester.  $C_{j}$  is Credits for the subjects.  $GP_{i}$  is the grade point obtained for the subject and the summation is over all the subjects in that semester.

**ii)** A Cumulative Grade Point Average (CGPA) will be computed for every student at the end of each semester. The CGPA would give the cumulative performance of the student from the first semester up to the end of the semester to which it refers to and is calculated as follows:

$$CGPA = \frac{\sum_{1}^{m} GPA_{j} \times TC_{i}}{\sum_{1}^{m} TC_{i}}$$

Where 'm' is the number of semester under consideration.  $TC_j$  the total number of credits for a  $j^{th}$  semester and GPA<sub>j</sub> is the Grade Point Average of the  $j^{th}$  semester. Both GPA and CGPA will be rounded off to the second digit after decimal and recorded as such.

While computing the GPA / CGPA, the subjects in which the student is awarded zero grade points will also be included.

### 15.0 Grade Sheet:

A grade sheet (Memorandum) will be issued to each student indicating his performance in all subjects of that semester in the form of grades and also indicating the GPA and CGPA.

### 16.0 Transcripts:

After successful completion of prerequisite credits for the award of degree, a Transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued if required after the payment of requisite fee and also as per norms in vogue.

### 17.0 Rules of Discipline:

- **17.1** Any attempt by any student to influence the teachers, Examiners, faculty and staff of Examination section for undue favours in the exams, and bribing them either for marks or attendance will be treated as malpractice cases and the student can be debarred from the college.
- **17.2** When the student absents himself, he is treated as to have appeared and obtained zero marks in that subject(s) and grading is done accordingly.
- **17.3** When the performance of the student in any subject(s) is cancelled as a punishment for indiscipline, he is awarded zero marks in that subject(s).
- **17.4** When the student's answer book is confiscated for any kind of attempted or suspected malpractice, the decision of the Chief Superintendent is final.

### **18.0 Minimum Instruction Days:**

The minimum instruction days for each semester shall be 95 clear instruction days excluding the days allotted for tests/examinations and preparation holidays declared if any.

### **19.0** Amendment of Regulations:

The college may, from time to time, revise, amend or change the regulations, scheme of examinations and syllabi. However the academic regulations of any student will be same throughout the course of study in which the student has been admitted. However students will continue to be in the academic regulations in which they were readmitted.

### 20.0 Transfers

There shall be no branch transfers after the completion of admission process.

### 21.0 General:

- **21.1** The Academic Regulations should be read as a whole for the purpose of any interpretation.
- **21.2** In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.
- **21.3** The Institute may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the Institute.
- **21.4** Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".

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### Autonomous **INFORMATION TECHNOLOGY** Academic Regulations for B. Tech. (Lateral Entry Scheme)

## (Effective for the students getting admitted into II year from the Academic Year 2016-2017 onwards)

- **1.0** The Students have to acquire a minimum of 142credits out of 148from II to IV year of B.Tech. Program (Regular) for the award of the degree.
- **2.0** Students, who fail to fulfil the requirement for the award of the degree in 6 consecutive academic years from the year of admission, shall forfeit their seat.
- **3.0** The same attendance regulations are to be adopted as that of B. Tech. (Regular).

### 4.0 **Promotion Rule:**

The student shall be promoted from third year to fourth year only if he fulfils the academic requirements of securing minimum of 50 credits out of 100 credits from all the exams conducted up to and including III year II semester regular examinations, whether the candidate takes the examinations or not.

### 5.0 Award of Class:

After the student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes: The marks obtained in the best 134 credits will be considered for the calculation of percentage and award of class.

Class	% of marks to be	Division/	CCDA	From the
Awarded	secured	Class	CGPA	aggregate
First Class		First class		marks
with	70% and above	With		secured for
Distinction		Distinction	≥ 7.5	best 134
First Class	Below 70% but not	First Class	6 5 and < 7 5	Credits
Flist Class	less than 60%	First Class	0.5 <i>unu</i> < 7.5	(i.e. II year
Second Class	Below 60% but not	Second	$\geq$ 5.5 and	to IV year)
Second Class	less than 50%	Class	< 6.5	excluding
	Below 50% but not			Skill
Pass Class	less than 40%	Pass	$\geq$ 4 and < 5.5	Development
	1000 11011 4070			Courses

Table 1: Award of Division

(The marks in Internal evaluation and End Examination shall be shown separately in the marks memorandum)

**6.0** All other regulations as applicable for B. Tech. Four-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme).

### Autonomous INFORMATION TECHNOLOGY

### **I B.TECH, I-SEMESTER COURSE STRUCTURE**

		Hou	rs/W	/eek		Marks		
Subject Code	Name of the Subject	Theory	Tutorial	Lab	Credits	Internal	External	Total
THEORY								
A0001151	Professional English - I	3	1	-	3	30	70	100
A0004151	Mathematics - I	3	1	I	3	30	70	100
A0301152	Engineering Drawing	3	1	I	3	30	70	100
A0501151	C Programming	3	1	I	3	30	70	100
A0002151	Engineering Physics	3	1	I	3	30	70	100
A1201151	Information Technology Fundamentals	3	1	I	3	30	70	100
PRACTICA	LS							
A0093152	Engineering Physics Lab	-	-	3	2	25	50	75
A0591151	C Programming Lab	-	I	3	2	25	50	75
A1291152	IT Workshop	-	-	3	2	25	50	75
A1292151	Unix Lab	-	-	3	2	25	50	75
Contact Periods / Week		18	6	12	26	280	620	900

### **I B.TECH, II-SEMESTER COURSE STRUCTURE**

		Hou	rs/W	/eek		Marks		
Subject Code	Name of the Subject	Theory	Tutorial	Lab	Credits	Internal	External	Total
THEORY								
A0005152	Professional English – II	3	1	I	3	30	70	100
A0006152	Mathematics - II	3	1	I	3	30	70	100
A0008152	Solid State Physics	3	1	I	3	30	70	100
A0003151	Modern Engineering Chemistry	3	1	-	3	30	70	100
A0502152	Data Structures through C	3	1	I	3	30	70	100
A0401151	Fundamentals of Electronic Devices	3	1	-	3	30	70	100
PRACTICA	LS							
A0091151	Engineering Chemistry Lab	-	-	3	2	25	50	75
A0592152	Data Structures through C Lab	-	-	3	2	25	50	75
A0391151	Engineering Work Shop	-	-	3	2	25	50	75
A0092151	English Language & Communication Skills Lab	-	-	3	2	25	50	75
Contact Periods / Week		18	6	12	26	280	620	900

## Autonomous INFORMATION TECHNOLOGY

### **II B.TECH, I-SEMESTER COURSE STRUCTURE**

	Name of the Subject	Hou	ırs/W	/eek		Marks			
Subject Code		Theory	Tutorial	Lab	Credits	Internal	External	Total	
THEORY									
A0015153	Mathematical Methods	3	1	-	3	30	70	100	
A1202153	Foundations of Software Engineering	3	1	-	3	30	70	100	
A1203153	Fundamentals of Object-Oriented Design	3	1	-	3	30	70	100	
A0430153	Digital Logic Design	3	1	-	3	30	70	100	
A1204153	Mathematical Foundations of IT	3	1	-	3	30	70	100	
A1205153	Algorithms and Data Structures	3	1	-	3	30	70	100	
SKILL DEV	ELOPMENT COURSE								
A0011154	Corporate Management Skills	1	2	-	1	30+70	-	100	
PRACTICA	LS								
A1293153	Fundamentals of Object Oriented Design Lab	-	-	3	2	25	50	75	
A0472153	Digital Logic Design Lab	-	-	3	2	25	50	75	
A1294153	Algorithms and Data Structures Lab Using C	-	-	3	2	25	50	75	
Contact Periods / Week		19	8	9	25	355	570	925	

### **II B.TECH, II-SEMESTER COURSE STRUCTURE**

		Hou	ırs/W	/eek	Marks			-
Subject Code	Name of the Subject	Theory	Tutorial	Lab	Credits	Internal	External	Total
THEORY								
A0012156	Probability and Statistics	3	1	-	3	30	70	100
A1206154	Computer Organization and Design	3	1	-	3	30	70	100
A0009153	Environmental Science	3	1	-	3	30	70	100
A1207154	Relational Database Design and Development	3	1	-	3	30	70	100
A1208154	UNIX And Shell Programming	3	1	-	3	30	70	100
A1209154	Java Programming	3	1	-	3	30	70	100
SKILL DEV	ELOPMENT COURSE							
A0010153	Aptitude, Arithmetic, Reasoning and Comprehension	1	2	-	1	30+70		100
PRACTICA	LS							
A1295154	Relational Database Systems Lab	-	-	3	2	25	50	75
A1296154	Unix and Shell Programming Lab	-	-	3	2	25	50	75
A1297154	Java Programming Lab	-	-	3	2	25	50	75
Contact Periods / Week		19	8	9	25	355	570	925

## Autonomous INFORMATION TECHNOLOGY

### **III B.TECH, I-SEMESTER COURSE STRUCTURE**

		Hou	ırs/W	/eek		Marks			
Subject Code	Name of the Subject	Theory	Tutorial	Lab	Credits	Internal	External	Total	
THEORY									
A1210155	Modern Operating System	3	1	-	3	30	70	100	
A1211155	Data Communications & Networking – 1	3	1	-	3	30	70	100	
A1212155	Web Application Through JAVA & Python	3	1	-	3	30	70	100	
A1213155	Database Management Concepts	3	1	-	3	30	70	100	
A0510155	C# and .NET Framework	3	1	-	3	30	70	100	
A0016155	Engineering Economics and Accountancy	3	1	-	3	30	70	100	
SKILL DEV	ELOPMENT COURSE								
A1214155	Man Management	1	2	-	1	30+70	-	100	
PRACTICA	LS								
A1298155	Modern Operating System Lab	-	-	3	2	25	50	75	
A1299155	Web Application Through JAVA & Python Lab	-	-	3	2	25	50	75	
A0594155	C# & .NET Framework Lab	-	-	3	2	25	50	75	
Contact Periods / Week		19	8	9	25	355	570	925	

### **III B.TECH, II-SEMESTER COURSE STRUCTURE**

	Name of the Subject	Hou	rs/W	eek		Marks			
Subject Code		Theory	Tutorial	Lab	Credits	Internal	External	Total	
THEORY									
A1215156	Embedded Computing	3	1	-	3	30	70	100	
A1216156	Basics Of Scripting Languages	3	1	-	3	30	70	100	
A1217156	Software Testing Methodologies and Tools	3	1	-	3	30	70	100	
A1218156	Data Communication & Networking - 2	3	1	-	3	30	70	100	
	Elective-I	3	1	-	3	30	70	100	
	Elective-II / MOOC	3	1	-	3	30	70	100	
SKILL DEV	ELOPMENT COURSE								
A0013156	Professional Ethics and soft skills	1	2	-	1	30+70	-	100	
PRACTICAL	LS .								
A1281156	Embedded Computing Lab	-	-	3	2	25	50	75	
A1282156	Basics Of Scripting Languages LAB	-	-	3	2	25	50	75	
A1283156	Software Testing Tools Lab	-	-	3	2	25	50	75	
Contact Periods / Week		19	8	9	25	355	570	925	

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### **IV B.TECH, I-SEMESTER COURSE STRUCTURE**

		Ηου	ırs/W	leek		Marks			
Subject Code	Name of the Subject	Theory	Tutorial	Lab	Credits	Internal	External	Total	
THEORY									
A1225157	Theory Of Computation	3	1	-	3	30	70	100	
A1226157	Information Security	3	1	I	3	30	70	100	
A1227157	Mobile Computing	3	1	I	3	30	70	100	
A1228157	Cloud Infrastructure And Services	3	1	I	3	30	70	100	
	Elective-III	3	1	I	3	30	70	100	
	Open Elective	3	1	I	3	30	70	100	
SKILL DEV	ELOPMENT COURSE								
A1236157	Group Discussion and Mock Interview (GDMI)	1	2	-	1	30+70	-	100	
PRACTICA	LS								
A1284157	Cloud Computing Lab	-	-	3	2	25	50	75	
A1285157	Information Security & Mobile Computing Lab	-	-	3	2	25	50	75	
A1286157	Mini Project	-	-	3	2	25	50	75	
Contact Periods / Week		19	8	9	25	355	570	925	

### **IV B.TECH, II-SEMESTER COURSE STRUCTURE**

	Name of the Subject	Hou	ırs/W	/eek		Marks			
Subject Code		Theory	Tutorial	Lab	Credits	Internal	External	Total	
THEORY									
A0017157	Management Science	3	1	-	3	30	70	100	
	Elective-IV	3	1	I	3	30	70	100	
	Elective-V/MOOC	3	1	-	3	30	70	100	
SKILL DEV	ELOPMENT COURSE								
A1238158	Data Analysis and Visualization	1	2	-	1	30	70	100	
A1287158	Comprehensive Viva	-	-	-	2	-	50	50	
A1288158	Seminar	-	-	-	1	50	-	50	
A1289158	Project	-	-	-	8	50	100	150	
	Extracurricular & Co-curricular Activities	-	-	-	2	-	-	-	
Contact Pe	Contact Periods / Week		5	-	23	220	430	650	

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### **ELECTIVES**

Subject Code		ELECTIVES
		III B.TECH, II-SEMESTER
		ELECTIVE - I
A1219156	G1.1	Basics of Image Processing
A1220156	G1.2	Data Warehousing and Data Mining concepts
A1221156	G1.3	Information Storage and Management
		ELECTIVE - II/MOOC
A1222156	G2.1	Machine Learning
A1223156	G2.2	Natural Language Processing
A1224156	G2.3	Programming Mobile Applications for Android Handheld Systems
		IV B.TECH, I-SEMESTER
		ELECTIVE-III
A1229157	G3.1	Middleware Technologies And Service Oriented Architecture
A1230157	G3.2	SAP-ABAP And Basic Applications
A1231157	G3.3	Software Project Management
		Open ELECTIVE
A1232157	0.1	Human Computer Interaction
A1233157	O.2	E – Commerce
A1234157	O.3	Cyber Laws
A1235157	O.4	Biometrics
		IV B.TECH, II-SEMESTER
		ELECTIVE - IV
A1237158	G4.1	Information Retrieval Systems
A0515158	G4.2	Backup Recovery Systems And Architecture
A1239158	G4.3	Soft Computing
A1240158	G4.4	Principles Of Compiler Design
		ELECTIVE-V/MOOC
A1241158	G5.1	Data Science And Big Data Analytics
A1242158	G5.2	Forensics And Incident Response
A1243158	G5.3	Game Programming
A1244158	G5.4	Green IT
<u>COURS</u>	ES OFFERI	ED TO OTHER DEPARTMENTS (OPEN ELECTIVES)
A1208154	UNIX And	Shell Programming
A1212155	Web Applie	cation Through JAVA & Python
A1216156	Basics Of S	Scripting Languages

A1217156 Software Testing Methodologies and Tools

Information Security

Mobile Computing

A1226157

A1227157

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### **INFORMATION TECHNOLOGY**

### MINOR ACADEMIC CURRICULUM 2015-16 CIVIL ENGINEERING

Subject Code	Course Title	Credits	Theory	Total Marks	External	Internal
A0149153	Strength of Materials-I	3	3+1*	100	70	30
A0109154	Structural Analysis -I	3	3+1*	100	70	30
A0114155	Water Resources Engineering-I	3	3+1*	100	70	30
A0110154	Concrete Technology	3	3+1*	100	70	30
A0112155	Transportation Engineering-I	3	3+1*	100	70	30
A0171158	Minor Project	5	Grade			

### ELECTRICAL & ELECTRONICS ENGINEERING POWER ENGINEERING

Subject Code	Course Title	Credits	Theory	Total Marks	External	Internal
A0242152	Principles of Electrical Engineering	3	3+1*	100	70	30
A0208154	Generation & Distribution of Electrical Power	3	3+1*	100	70	30
A0212155	Transmission of Electrical Power	3	3+1*	100	70	30
A0239158	Electrical Distribution Systems	3	3+1*	100	70	30
A0237158	Utilization of Electrical Power7	3	3+1*	100	70	30
A0271158	Minor Project	5	Grade			

### ELECTRICAL & ELECTRONICS ENGINEERING ELECTRICAL MACHINES

Subject Code	Course Title	Credits	Theory	Total Marks	External	Internal
A0205153	Circuit Theory	3	3+1*	100	70	30
A0242154	Network Theory	3	3+1*	100	70	30
A0206153	Electrical Machines-I	3	3+1*	100	70	30
A0207154	Electrical Machines-II	3	3+1*	100	70	30
A0210155	Electrical Machines-III	3	3+1*	100	70	30
A0272158	Minor Project	5	Grade			

### ELECTRICAL & ELECTRONICS ENGINEERING POWER ELECTRONICS

Subject Code	Course Title	Credits	Theory	Total Marks	External	Internal
A0242152	Principles of Electrical Engineering	3	3+1*	100	70	30
A0402153	Electronic Circuits	3	3+1*	100	70	30
A0211155	Power Electronics-I	3	3+1*	100	70	30
A0214156	Power Electronics-II	3	3+1*	100	70	30
A0226157	Power Semiconductor Drives	3	3+1*	100	70	30
A0273158	Minor Project	5	Grade			

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### **INFORMATION TECHNOLOGY**

### **MECHANICAL ENGINEERING** THERMAL ENGINEERING

Subject Code	Course Title	Credits	Theory	Total Marks	External	Internal
A0306153	Thermodynamics	3	3+1*	100	70	30
A0309154	Internal Combustion Engines	3	3+1*	100	70	30
A0313155	Thermal Engineering	3	3+1*	100	70	30
A0318156	Heat Transfer	3	3+1*	100	70	30
A0328157	Refrigeration and Air Conditioning	3	3+1*	100	70	30
A0372158	Minor Project	5	Grade			

### MECHANICAL ENGINEERING MECHANICAL DESIGN

Subject Code	Course Title		Theory	Total Marks	External	Internal
A0302151	Engineering Mechanics-I	3	3+1*	100	70	30
A0305153	Material Science & Metallurgy	3	3+1*	100	70	30
A0308154	Kinematics of Machinery	3	3+1*	100	70	30
A0312155	Design of Machine Elements -I	3	3+1*	100	70	30
A0325157	CAD/CAM	3	3+1*	100	70	30
A0373158	Minor Project	5	Grade			

### **MECHANICAL ENGINEERING PRODUCTION ENGINEERING**

Subject Code	Course Title	Credits	Theory	Total Marks	External	Internal
A0311154	Manufacturing Technology	3	3+1*	100	70	30
A0316155	Machine Tools	3	3+1*	100	70	30
A0319156	Engineering Metrology	3	3+1*	100	70	30
A0322156	Tool Design	3	3+1*	100	70	30
A0341158	Modern Manufacturing Methods	3	3+1*	100	70	30
A0374158	Minor Project	5	Grade			

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### ELECTRONICS & COMUNICATIONS ENGINEERING SIGNAL PROCESSING

Subject Code	Course Title	Credits	Theory	Total Marks	External	Internal
A0409153	Signals and Systems	3	3+1*	100	70	30
A0406157	Digital Signal Processing	3	3+1*	100	70	30
A0436158	Advanced Digital Signal Processing	3	3+1*	100	70	30
A0427157	Digital Image Processing	3	3+1*	100	70	30
A0431157	DSP Architecture and Applications	3	3+1*	100	70	30
A0471158	Minor Project	5	Grade			

### ELECTRONICS & COMUNICATIONS ENGINEERING

### EMBEDDED SYSTEMS

Subject Code	Course Title	Credits	Theory	Total Marks	External	Internal
A0213155	Microprocessors and Microcontrollers	3	3+1*	100	70	30
A0426157	VLSI Design	3	3+1*	100	70	30
A0421156	Embedded System Concepts	3	3+1*	100	70	30
A0418155	Embedded 'C' & Verilog	3	3+1*	100	70	30
A0422156	FPGA Architecture and Applications	3	3+1*	100	70	30
A0473158	Minor Project	5	Grade			

### COMPUTER SCIENCE & ENGINEERING MINOR IN COMPUTER SCIENCE

Subject Code	Course Title	Credits	Theory	Total Marks	External	Internal
A0512153	Discrete Mathematics	3	3+1*	100	70	30
A0518154	Design and Analysis of Algorithms	3	3+1*	100	70	30
A0519154	Operating Systems	3	3+1*	100	70	30
A0514153	Database Management Systems	3	3+1*	100	70	30
A0509157	Computer Networks	3	3+1*	100	70	30
A0574158	Minor Project	5	Grade			

### <u>COMPUTER SCIENCE & ENGINEERING</u> MINOR IN WEB PROGRAMMING

Subject Code	Course Title	Credits	Theory	Total Marks	External	Internal
A0516154	Core Java Programming	3	3+1*	100	70	30
A0520155	Advanced Java Programming	3	3+1*	100	70	30
A0508156	Web Technologies	3	3+1*	100	70	30
A0510155	C# & .NET Frame Work	3	3+1*	100	70	30
A0540157	PHP Programming	3	3+1*	100	70	30
A0575158	Minor Project	5	Grade			

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### **INFORMATION TECHNOLOGY**

### INFORMATION TECHNOLOGY MINOR DEGREE IN DATABASE TECHNICS

Subject Code	Course Title	Credits	Theory	Total Marks	Externa	Internal
A1202153	Foundations of Software Engineering	3	3+1*	100	70	30
A1207154	Relational Database Design and Development	3	3+1*	100	70	30
A1213155	Database Management Concepts	3	3+1*	100	70	30
A1228157	Cloud Infrastructure And Services	3	3+1*	100	70	30
A1217156	Software Testing Methodologies and Tools	3	3+1*	100	70	30
A1271158	Minor Project 5 Grade					

### **INFORMATION TECHNOLOGY**

### MINOR DEGREE IN WEB TECHNOLOGY CONCEPTS

Subject Code	Course Title	Credits	Theory	Total Marks	External	Internal
A1203153	Fundamentals of Object-Oriented Design	3	3+1*	100	70	30
A1209154	Java Programming	3	3+1*	100	70	30
A1212155	Web Application Through JAVA & Python	3	3+1*	100	70	30
A1216156	Basics Of Scripting Languages	3	3+1*	100	70	30
A1211155	Data Communications & Networking – 1	3	3+1*	100	70	30
A1272158	Minor Project	5	Grade			

### MASTER OF BUSINES ADMINISTRATION HUMAN RESOURCE MANAGEMENT

### **SEMESTER – V, VI, VII & VIII (5\*3 + 1\*5 = 20 Credits)**

Subject Code	Semester	Course Title	Credits	Theory	Total Marks	External	Internal
E0009152	Semester V	Human Resource Management	3	3+1*	100	70	30
E0024153	Semester VI	Training & Development	3	3+1*	100	70	30
E0028153	Semester VI	Performance Management	3	3+1*	100	70	30
E0039154	Semester VII	Organization Development	3	3+1*	100	70	30
E0014152	Semester VIII	Business Research Methods	3	3+1*	100	70	30
E0047154	Semester VIII	Minor Project	5	Grade			

### MARKETING MANAGEMENT

### SEMESTER – V, VI, VII & VIII (5\*3 + 1\*5 = 20 Credits)

Subject Code	Semester	Course Title	Credits	Theory	Total Marks	External	Internal
E0011152	Semester V	Marketing Management	3	3+1*	100	70	30
E0021153	Semester VI	Product & Brand Management	3	3+1*	100	70	30
E0033153	Semester VI	Advertising Management	3	3+1*	100	70	30
E0029153	Semester VII	Sales & Distribution	3	3+1*	100	70	30
E0014152	Semester VIII	Business Research Methods	3	3+1*	100	70	30
E0047154	Semester VIII	Project	5	Grade			

1\* - Tutorial

## Autonomous SCHOOL OF INFORMATION TECHNOLOGY

I B.Tech, I-Sem (IT)

T C 3+1\* 3

### (A0001151) PROFESSIONAL ENGLISH – I (Common to All Branches)

English is the international language of business and opens up many opportunities to engineering professionals. This course introduces the essential learning theories and practices needed for a core professional. The course details the needs of LSRW Skills of the English language and explains how to face variant situations through soft skills. With a clear structure and can-do objectives in every Unit, Professional English Course is a straight forward, student-friendly course. It gradually builds up all the necessary knowledge to help students achieve their learning objectives.

### **OBJECTIVES**

Students should be able to:

- Acquire basic language skills in order to communicate in English language.
- Develop their awareness of the importance of English as a means of international communication.
- Develop their LSRW skills, namely listening, speaking, reading and writing skills thereby improving their proficiency in oral and written communication in technical English.
- Develop the linguistic competence that enables them to be aware of the cultural, economical and social issues of the society in order to contribute in giving solutions.

### **OUTCOMES:**

Students would be able to:

- Engage in correct usage of grammatical tenses and usage in writing and speaking.
- Produce Technical Writing formats
- Define meaning of vocabulary from conceptual clues.
- Conduct oral presentations with confidence.

### UNIT I

Practical English Usage - I

- a) Review of Grammar-Parts of Speech-Tenses
- b) Introduction to International English Language Testing System (IELTS) Level-1

Practice Tests - IELTS

### UNIT II

- a) Technical Writing I: Techniques of Writing-Comparison & Contrast Pattern-Cause & Effect Pattern - Paragraph Writing-Developing An Essay-Letter Formats-Full block Format-Official & Business Letters
- b) Soft Skill Fish! Philosophy Attitude is Everything by Harry Paul

### UNIT III

- a) Reading Skills SQR3 Technique-Skimming & Scanning- Reading Comprehension
- b) Autobiography New Horizons *My Struggle for an Education* by Booker T. Washington

### UNIT IV

- a) Semantics Etymology Synonyms & Antonyms-Phrasal verbs-Idioms
- b) Essay The Law of Pure Potentiality by Deepak Chopra

## Autonomous INFORMATION TECHNOLOGY

### UNIT V

- a) Literary Techniques Allegory Metaphor Epithet
- b) Short story New Horizons The Happy Prince by Oscar Wilde
- c) Poem New Horizons Where the Mind is without Fear by Rabindranath Tagore

### UNIT VI

- a) Movie Analysis Life of Pi Plot Characterization Techniques
- b) Project & Case Studies

### **\*TEXT BOOK PRESCRIBED: NEW HORIZONS, FOR THE JNTUA, PEARSON, 2014.** SUGGESTED READING:

- Practical English Usage by Michael Swan, Oxford University Press
- Murphy's English Grammar by Raymond Murphy, Cambridge University press 2004
- Technical writing 3<sup>rd</sup> edition by Sharon J. Gerson & Steven M. Gerson, Pearson Education 2001
- Communication Skills for Engineers( Second Edition) by C. Muralikrishna & Sunita Mishra, Pearson Education Ltd, 2011
- ✤ Top tips for IELTS, British Council, On line edition

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## Autonomous INFORMATION TECHNOLOGY

I B.Tech, I-Sem (IT)

T C 3+1\* 3

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### (A0004151) MATHEMATICS-I

#### (Common to All Branches)

### **OBJECTIVES:**

✤ To make aware students about the importance and symbiosis between Mathematics and Engineering. Achieve confidence with mathematical tools which an essential weapon in modern Graduate Engineer's Armory. Balance between the development of understanding and mastering of solution techniques with emphasis being on the development of student's ability to use Mathematics with understanding to solve engineering problems by retaining the philosophy learning by doing.

### **OUTCOMES:**

By the end of module students will be expected to demonstrate the knowledge of Differential equations, Laplace Transformations, Matrices and their applications in diverse engineering applications.

### UNIT – I

**Infinite Series:** Sequence – Convergence and divergence of sequence. Series – Tests of convergence and divergence – P-Test, Comparison Test, Ratio Test, n-Root Test, logarithmic Test- Alternating Series – Absolute and conditional convergence of series.

### UNIT-II

Differential equations of first order and first degree – Exact, linear and Bernoulli equations. Applications to LR & CR circuits, orthogonal trajectories.

#### UNIT – III

Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type  $e^{ax}$ , Sin ax, cos ax, polynomials in x,  $e^{ax}$  V(x), xV(x), Method of variation of parameters.

#### $\mathbf{UNIT} - \mathbf{IV}$

Rolle's Theorem – Lagrange's Mean Value Theorem – (excluding proof).Simple examples of Taylor's and Maclaurin's Series.

Functions of several variables – Jacobian – Maxima and Minima of functions of two variables, Lagrangian method of Multipliers with three variables only.Radius of Curvature.

#### $\mathbf{UNIT} - \mathbf{V}$

Laplace transform of standard functions – Inverse transform – First shifting Theorem, Transforms of derivatives and integrals – Unit step function – Second shifting theorem – Dirac's delta function – Convolution theorem – Laplace transform of Periodic function.

#### $\mathbf{UNIT} - \mathbf{VI}$

Differentiation and integration of Laplace transform – Application of Laplace transforms to ordinary differential equations of first and second order.

#### **TEXT BOOKS:**

- 1. Advanced Engineering Mathematics By Erwin Kreyszig.
- 2. Advanced Engineering Mathematics By R.K. Jain and S.R.K. Iyengar, Narosa Publications.

### **REFERENCES:**

- 1. A Text Book of Engineering Mathematics, Vol 1, T.K.V. Iyengar, B. Krishna Gandhi and Others S. Chand & Company.
- 2. Higher Engineering Mathematics by B.S.Grewal, Khanna Publishers.
- 3. A Text Book of Engineering Mathematics, Thomson Book Collection.
- 4. Engineering Mathematics By Srimantha Pal et.al. Oxford University Press.
- 5. Engineering Mathematics, Sarveswara Rao Koneru, Universities Press.

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### (A0301152) ENGINEERING DRAWING (Common to all branches)

### **COURSE OBJECTIVES:**

- ◆ To impart and inculcate proper understanding of the theory orthographic projection.
- ✤ To improve the visualization skills.
- ◆ To enable the students with various concepts like dimensioning, Construction of conic Sections and polygons.
- To impart the knowledge on understanding and drawing of simple solids.
- To know about sections and developments of solids etc.

### **COURSE OUTCOMES:** At the end of the course, the student will be able to:

- Understand the theory of orthographic projection.
- Understand the conventions and the methods of engineering drawing.
- \* Know the importance of sectioning and Developments of solids in actual applications.
- Improve their visualization skills so that they can apply these skills in developing new products.

### UNIT-I

Polygons-Construction of Regular Polygons using given length of a side; Conic sections-Ellipse- Arcs of Circles and Oblong Methods, Construction of Parabola and Hyperbola by eccentricity method only.

#### UNIT-II

Introduction to Orthographic Projections- Projections of Points-Projections of Straight Lines parallel to both planes; Projections of Straight Lines-Parallel to one and inclined to other plane, inclined to both planes, determination of true lengths, angle of inclinations.

#### UNIT-III

Projections of Planes- Regular Planes Perpendicular / parallel to one Reference, Plane and inclined to other Reference Plane.

#### UNIT-IV

Projections of Solids-Prisms, pyramids, cones and Cylinders with the axis inclined to one Plane.

#### UNIT-V

Section of solids: Sectioning of prism, pyramid, cone and cylinder- sectional view - true shape. Solids in simple position and cutting plane inclined to one reference plane only.

Development of surface of solids: Development of truncated prism, pyramid, cone and cylinder - frustum of cone and pyramid.

#### **UNIT-VI**

Conversion of Isometric Views to Orthographic Views / Projections - Conversion of Orthographic Views to Isometric Projections and Views.

#### **TEXT BOOK:**

- 1. Engineering Drawing by N.D. Bhatt, Chariot Publications.
- 2. Engineering Drawing and Graphics, Venugopal/New age publications.

#### **REFERENCE BOOKS:**

- 1. Engineering Drawing, N.S Parthasarathy & Vela Murali, Oxford Publishers
- 2. Engineering Drawing. K.L Narayana, P. Kannaiah, Scitech Publications.
- Engineering Drawing, B.V.R Gupta, J.K. Publishers.
   Engineering Drawing by M.B. Shah and B.C.Rana, Pearson Publishers.
- 5. Engineering Drawing, Johle, Tata Mc Graw-Hill.
- 6. K.V. Natarajan, 'A text book of Engineering Graphics', Dhanalakshmi publishers, Chennai..

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### (A0501151) C PROGRAMMING

### (Common to All Branches)

### **OBJECTIVES:**

- ✤ To make students aware about fundamentals of computer programming.
- ✤ To provide exposure on C programming language
- To provide exposure on various C programming concepts like arrays, functions, pointers, structures etc.,
- To develop solutions for various problems by using C programming language by students.

### **OUTCOMES:**

By the end of this course, students should be able

- ✤ To understand about the various techniques for problem solving.
- To understand the fundamental concepts of C language like data types, keywords, operators, Input/Output functions and control statements.
- To understand how to develop C programs to solve various kinds of problems by using different C programming concepts like arrays, functions, pointers.

### UNIT I

**INTRODUCTION TO COMPUTER PROGRAMMING LANGUAGES**: Evolution of Computer Programming languages. Fundamentals of Algorithms and Flowcharts. Simple examples on how to write and trace an effective algorithms and how to draw an effective flow charts. Program control structures – sequence, selection and iteration. Software Development Method

### UNIT II - C

**LANGUAGE FUNDAMENTALS:** General Form of a C Program, Steps to execute C program, Character set of C language, Data Types, Constants and Variables, Identifiers, Keywords, Operators, Precedence of operators, Expressions. Example Programs on the topics covered in this unit

### UNIT III

**CONTROL STATEMENTS IN C LANGUAGE:** Non iterative statements – if statement, if else statement, nested if else statement, if else ladder statement, switch statement, go to statement. Iterative statements – while loop, do while loop and for loop. Example Programs on the topics covered in this unit.

### UNIT IV

**ARRAYS IN C LANGUAGE:** Importance of an array in C language, Definition, Need of arrays while writing C programs. Types of arrays - One dimensional array, Two dimensional array. Declaration of One dimensional array, initialization of one dimensional array, storing and accessing the elements from a one dimensional array.Two-dimensional Arrays and their declaration, initialization, storing & accessing elements from it. Example Programs on the topics mentioned above. Strings - Definition, Declaring and initializing strings, Basic Operations on strings, String handling Functions. Example Programs on the topics mentioned above.

### UNIT V

**FUNCTIONS IN C LANGUAGE:** Top down approach of problem solving, Library Functions and User defined functions. Need for user-defined functions. General form of declaring a function, Elements of an user defined functions- Function definition Function call, Function declaration, Function name, return type, parameters, return statements.

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Categorization of functions with respect to parameters and return values.Definition of Scope of a variable with suitable examples. Storage Classes - Automatic, External, Static, and Register. Arrays and functions - Passing an entire array as an Argument to a function.Preprocessor Commands. Example Programs on the topics mentioned above.

### UNIT VI

**POINTERS IN C LANGUAGE: Pointers** - Pointer variable and its importance, Pointer variable declaration, initialization of pointer variables, how to access a value from a memory location through it's pointer variable. Arithmetic operations on pointer variables, Scale factor length. Pointers and functions - pointers as function arguments (i.e., call-by-reference), Pointers and Arrays, Pointers and Strings, Array of Pointers, Pointers to Pointers, Generic Pointers, Pointer to Functions. Example Programs on the topics mentioned above.

### **TEXT BOOKS:**

- 1. Programming in C ,Pradeep Dey, Manas Ghosh, Oxford Heigher Education
- 2. Computer programming and Data Structures, E.Balaguruswamy, Tata Mc Graw Hill. 2009 revised edition.
- 3. The C Programming Language, Brian W.Kerninghan, Dennis M.Ritchie
- 4. Programming in C , Dr. N. Uday Bhaskar, Winger publications

### **REFERENCES:**

- 1. Let us C Yeshwanth kanetkar, 8th Edition.BPB Publications
- 2. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
- 3. Data Structures using C A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education / PHI, Eighth Edition.
- 4. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.

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### (A0002151) ENGINEERING PHYSICS (Common to ALL Branches)

### **OBJECTIVES:**

The Engineering Physics (Physics-I) for undergraduate program is designed

- To develop students with sufficient depth in both engineering and physics skills to produce engineers who can relate fundamental physics to practical engineering problems.
- To nurture innovative talent in modern applied physics, providing students both solid theoretical grounding and training in practical scientific research skills.
- To prepare students for careers in engineering where physics principles can be applied to the development of technology.

**OUTCOMES:** After the completion of the course the student will be able to:

- Understand the concept of signals by studying light behavior.
- ✤ Apply the concepts of light in optical fibers, light wave communication systems.
- ◆ Understand the use of lasers as light sources for low and high energy applications
- Solve engineering problems using the concepts of wave and particle nature of radiant energy.
- Construct a quantum mechanical model to explain the behavior of a system at the microscopic level.
- Understand the nature and characterization of acoustic design and nuclear accelerators.

### UNIT I:

**WAVE OPTICS:** Interference – Types of Interference - Interference in thin films by reflection - Newton's rings – Applications - Diffraction – Distinction Between Interference and Diffraction - Fraunhofer diffraction at a single slit - Fraunhofer diffraction at a double slit (qualitative) - Diffraction grating – Determination of Wavelength of Light - Polarization – Optic axis - Double Refraction in Calcite Crystal - Nicol Prism – Different types of polarized lights - Quarter and Half wave plates – Applications - problems.

### UNIT II:

**FIBER OPTICS:** Principle – Optical Fiber Cable- Propagation of Light in Optical fibres – Acceptance angle, Numerical aperture and Fractional Index change – Types of rays - Types of optical fibres (index, mode and material based) – Losses in Optical Fiber - Fibre optical communication system (Block diagram) – Merits of Optical Fibers – Applications - problems.

### UNIT III:

**LASERS:** Introduction – Characteristics - Einstein's A and B coefficients - Principle of Spontaneous emission and stimulated emission, Population inversion, pumping. – Important Components of a laser - - Types of lasers – Nd-YAG, He-Ne,  $CO_2$  and Semiconductor lasers (homo junction GaAs) – Hetrojunction laser – Applications - problems.

### UNIT IV:

**QUANTUM PHYSICS:** Matter waves – properties - de-Broglie's hypothesis – Heisenberg's Uncertainty principle – Electron as a wave experiment - Schrödinger's Time independent wave equation – Physical significance of wave function – Particle in a one dimensional box - problems.

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### UNIT V:

**ACOUSTICS AND ULTRASONICS:** Introduction to acoustics - Reverberation and reverberation time - growth and decay of energy - Sabine's formula (qualitative) - absorption coefficient and its measurement - factors affecting architectural acoustics - problems.

Introduction to ultrasonics – Production – magnetostriction effect - magnetostriction generator, piezoelectric effect - piezoelectric generator- Detection of ultrasonic waves – Types of Ultrasonic waves - properties - Cavitations - Non Destructive Testing –pulse echo system through transmission and reflection modes - Testing Methods - A, B and C –scan displays - problems.

### UNIT VI:

**NUCLEAR ENERGY:** Nuclear fission – Discovery of fission, binding energy curve, chain reaction (fission of U235), critical size, critical mass, essentials of nuclear reactor - problems.

Nuclear fusion – Thermonuclear reaction - fusion reaction in stars - p-p cycle, C-N cycle, controlled fusion – fusion reactor - problems.

### **REFERENCES:**

- 1) Arthus Beiser, "Concepts of Modern Physics", Tata Mc Graw Hill Publications, New Delhi.
- 2) Resnick and Halliday, "Physics Volume II", Wiley, New Delhi.
- 3) M.N. Avadhanulu and PG Kshirsagar, 'A Text book of Engineering Physics', S.Chand and company, Ltd., New Delhi, 2014.
- 4) D. K. Bhattacharya and Poonam Tandon, "Engineering Physics", Oxford University Press, 2015.
- 5) R. K. Gaur and S.C. Gupta, "Engineering Physics", Dhanpat Rai Publications, New Delhi.
- 6) Rajagopal, "Engineering Physics", PHI, New Delhi.
- 7) Rajendran, V and Marikani A, "Engineering Physics", Tata Mc Graw Hill Publications Ltd, III Edition, New Delhi.
- 8) Chitra Shadrach and Sivakumar Vadivelu, "Engineering Physics", Pearson Education, New Delhi.

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### (A1201151) INFORMATION TECHNOLOGY FUNDAMENTALS

### **COURSE OBJECTIVES:**

- 1. Introduces students to the general meaning of Information Technology (IT) as well as the different aspects, domains and applications of IT.
- 2. To provide an awareness of the necessary IT skills required for different careers.
- 3. Expose them to some of the key technologies of IT that used in the present day world of work.

### LEARNING OUTCOMES:

The student should be able to

- 1. Acquire basic IT terminology.
- 2. Understand the pervasiveness and impacts of IT in our everyday lives locally and globally as well as across organizations and industries.
- 3. Acquire a beginning knowledge of computer security and ethical issues.

### UNIT-1

### COMPUTER BASICS, ORGANIZATION & MEMORY:

**BASICS:** Introduction, Evolution of Computers, Generations of computers, Classification of Computers, Computer System, Applications of Computers.

**ORGANIZATION:** Central Processing Unit, Communication, Instruction Format, Instruction Cycle

**MEMORY:** Memory Hierarchy, RAM, ROM, RAM ROM & CPU Interaction.

### UNIT-2

### COMPUTER SOFTWARE & OPERATING SYSTEM:

**SOFTWARE:** Introduction, Categories of Software, Installing & Uninstalling of Software, Software Piracy, Software Terminologies.

**OPERATING SYSTEM:** Introduction, OS Definition, Evolution of OS, Types of OS, Function of OS.

### UNIT-3

**COMPUTER PROGRAMMING & LANGUAGES:** Introduction, Algorithm, Flowchart, Decision Tables, Pseudo code, Program Control Structures, Programming Paradigms, Programming Languages, Character of a good program, Generations of programming languages, Features of good programming language.

### UNIT-4

### DATA COMMUNICATION & COMPUTER NETWORKS:

**DATA COMMUNICATION:** Introduction, Data Communication, Transmission Media, Modulation, Multiplexing, Switching.

**COMPUTER NETWORK**: Computer Network, Network Topologies, Communication Protocol, Network Devices.

### UNIT-5

### **INTERNET & COMPUTER SECURITY:**

**INTERNET:** Introduction, Evolution, Basic internet terms, Getting connected to internet, Internet Applications, Difference between Internet Intranet & Extranet.

**COMPUTER SECURITY:** Introduction, Computer security definition, Malicious Programs, Cryptography, Digital Signature, Firewall, User Identification & Authentication, Data Backup & Recovery.

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### UNIT-6

### DATABASE FUNDAMENTALS & APPLICATION DOMAINS:

**DATA BASE:** Introduction, Definition, Logical Data Concepts, Physical Data Concepts, Database Management System & Architecture, Models, Normalization, Types of databases.

### TEXT BOOKS:

1. "Introduction to Information Technology" Second Edition by ITL Education Solutions Limited published by Pearson.

### **REFERENCE BOOKS:**

- 1. Information Technology Infrastructure & its Management by Manish Kumar Jha, Publisher: Dhanpath Rai & Co(2009)
- 2. Fundamentals of Information Technology, S K Bansal, APH Publisher, ISBN: 8176483540.
- 3. Fundamentals of Information Technology, CSV. Murthy, Himalaya, Students Edition CHMPUB100608.

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### (A0093152) ENGINEERING PHYSICS LAB

### (Common to All Branches)

### **OBJECTIVES:**

- The laboratory should help the student to develop a broad array of basic skills and tools of experimental physics and data analysis.
- The laboratory should help students to understand the role of direct observation in physics and to distinguish between inferences based on theory and the outcomes of experiments.
- To learn about the optical experiments, in establishing the fundamental Interference, Diffraction phenomena which will be clearly visualized with the light and laser experiments mentioned in the syllabus.
- To learn about the basic electronic experiments such as energy gap determination, type of extrinsic semiconductor using Hall effect, Stuart – Gees experiment in field intensity determination and Solar I – V characteristics.

### **OUTCOMES:**

- Optical experiments, which will establish the Interference, Diffraction phenomena, the dispersive power of a prism which will be clearly visualized with the experiments.
- Based on Diffraction phenomena with the use of a laser, a student can learn the determination of the wavelength of a light and particle size.
- In Fiber optics experiments, a student can learn propagation of light and bending losses in the fiber.
- The student can determine experimentally the rigidity modulus with the torsional pendulum with which he can also know the different modulus and strengths of different kind of Engineering materials.
- By learning the electronics experiments, Student can be able to determine band gap of the intrinsic semiconductor, type of extrinsic semiconductor in Hall effect.
- By studying the Stuart and Gees experiment student can be able to measure the field of the Helmholtz coil.
- By studying the solar I-V characteristics student can be able to understand the variation of light intensity in solar cell with distance.

### **List of experiments** (Any10 Experiments)

- 1. Newton's rings
- 2. Determination of thickness of a thin film
- 3. Spectrometer Transmission grating
- 4. Determination of wavelength of a Sodium light Normal Incidence
- 5. Dispersive power of a prism spectrometer
- 6. Laser experiment: wavelength determination using grating
- 7. Laser experiment: particle size determination
- 8. Determination of numerical aperture of an optical fiber
- 9. Field along the axis of coil carrying current Stewart Gee's method
- 10. Determination of rigidity modulus Torsional Pendulum
- 11. Determination of Band gap of Si or Ge Four probe method
- 12. Study of B H Curve.
- 13. Determination of Charge density and Hall coefficient or magnetic flux density Hall effect.
- 14. Study of Solar I-V characteristics
- 15. Measurement of Dielectric constant

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### (A0591151) C PROGRAMMING LAB (Common to All Branches)

### **OBJECTIVES:**

- ✤ To make the student to learn how to write programs in C language.
- ✤ To introduce different constructs of C language to the students to solve various kinds of problems.
- To make the students to implement different kinds of sorting algorithms like selection sort, bubble sort, insertion sort, quick sort and merge sort etc.
- To make the students to implement different kinds of searching algorithms like linear search and binary search etc.

### **OUTCOMES:**

By the end of this course, students should be able

- ✤ To understand about the fundamentals of Computer programming.
- To understand the fundamental concepts of C language like data types, keywords, operators, Input/Output functions and control statements.
- To understand how to develop C programs to solve various kinds of problems by using different C programming concepts like arrays, functions, pointers.

### **RECOMMENDED SYSTEMS / SOFTWARE REQUREMENTS:**

✤ Intel based desktop PC with ANSI C Compiler and Supporting Editors

### Exercise 1:

Write a C program to demonstrate the various operators used in C language.

### Exercise 2:

- a) Write a C program to find the roots of a quadratic equation.
- b) Write a C program to find both the largest and smallest number in a list of integers.

#### Exercise 2:

- a) Write a C program, which takes two integer operands and one operator from the user, performs the specified operation and then prints the result. (Consider the operators +,- ,\*, /, % and use Switch Statement)
- b) Write a C Program to find the reverse of a given number.

#### Exercise 3:

- a) Write a C program to find the sum of individual digits of a positive integer.
- b) Write a C program to generate the first 'n' terms of the Fibonacci sequence.
- [**Note:** A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.]
- c) Write a C program to generate all the prime numbers between 1 and n, where 'n' value is given by the user.

[**Note:** Develop each of the above programs by using different loop constructs supported by C language. (i.e., while, do while and for Loops)]

#### **Exercise 4:**

- a) Write a C Program to mask the most significant digit of the given number.
- b) Write a program which Prints the following patterns

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ABCDE         BDCBA         III           ABCD         DCBA         22222           ABC         CBA         3333333           AB         BA         44444444           A         A         A	ABCDE	FGFEDCBA	0
	ABCDE	F FEDCBA	111
A A 44444444	ABCD	DCBA	22222
	ABC	CBA	3333333
	AB	BA	44444444
	A	А	444444444

### **Exercise 5:**

- a) Write a C program to generate Pascal's triangle.
- b) Write a C program to construct a pyramid of numbers.

### Exercise 6:

- a) Write a C program to find all the even numbers in the given one dimensional array.
- b) Write a C program to print the elements of an array in reverse order.
- c) Write a C program to perform the following operations:
  i) Addition of Two Matrices ii) Multiplication of Two Matrices
  [Note: Use functions to implement the above specified operations]

### Exercise 7:

a)Write C programs that use both recursive and non-recursive functions

- i) To find the factorial of a given integer.
- ii) To find the GCD (greatest common divisor) of two given integers.

### Exercise 8:

- a) Write a C Program to solve the Towers of Hanoi problem by using recursive function.
- b) Writea C Program to demonstrate the various storage classes, which are supported by the C language. [i.e., automatic, external, static and register]

### Exercise 9:

- a) Write a C Program to demonstrate that, how to pass an entire array as an argument to a function with a suitable example.
- b) Write a C Program to perform various operations on given two strings using string handling functions.

### **Exercise 10:**

- a) Write a C Program to perform various arithmetic operations on pointer variables.
- b) Write a C Program to demonstrate the following parameter passing mechanisms: i) call-by-value ii) call-by-reference

#### Exercise 11:

- a) Write a C program that uses functions to perform the following operations:
  i) To insert a sub-string in to a given main string from the specified position.
  ii) To delete 'n' Characters from a given position in a given string.
- b) Write a C program to determine if the given string is a palindrome or not.

### Exercise 12:

- a) Write a C program that displays the position or index in the string 'S' where the string T' begins, or 1 if 'S' doesn't contain T'.
- b) Write a C program to count the lines, words and characters in a given text.

### **REFERENCE BOOKS**

- 1. Programming in C, Pradeep Dey, Manas Ghosh, Oxford Heigher Education
- 2. The Spirit of C, an introduction to modern programming, M.Cooper, Jaico Publishing House.
- 3. Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publications.
- 4. Computer Basics and C Programming, V. Raja Raman, PHI Publications.

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# (A1291152) IT WORKSHOP (Common to All Branches)

## **OBJECTIVES:**

- The IT Workshop for engineers is a training lab course.
- ✤ The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, Power Point and Publisher. It enables the students to understand and fix the common hardware, software issues & makes the students to install either Windows or UNIX based Operating system in the machines.
- Enable students to understand how computers work, different types of computers, functions of applications, input and data storage devices, different operating systems, ethics, data communications, and systems analysis and design
- It makes the students to understand and use the common office suite tools like word, excel etc effectively in their daily usage.
- To ensure the students to understand the basic networking concepts like IP Address etc

## **OUTCOMES:**

By the end of module students will be expected to demonstrate

- PC Hardware- introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. The students should work on working PC to disassemble and assemble to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.
- Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.
- Productivity tools- module would enable the students in crafting professional word documents, excel spread sheets and power point presentations using the Microsoft suite of office tools.

**PC Hardware** introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. The students should work on a working PC (PIV or higher)to disassemble and assemble back to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.

**Internet & World Wide Web** module introduces the different ways of hooking the PC on to the internet from home and workplace for usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.

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**Productivity tools** module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools

# PC HARDWARE

**Exercise 1 - Task 1:** Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

**Exercise 2 - Task 2:** Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video shall be given as part of the course content.

**Exercise 3 - Task 3:** Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

**Exercise 4 - Task 4:** Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

**Exercise 5 - Task 5: Hardware Troubleshooting:** Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva

**Exercise 6** - **Task 6: Software Troubleshooting:** Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

## **OFFICE TOOLS**

## WORD

**Exercise 7 - Word Orientation**: The mentor needs to give an overview of LaTeX and Microsoft (MS) office 2007,2010/ equivalent tool word: Importance of LaTeX and MS office 2007,2010/ equivalent tool Word as word Processors, Details of the four tasks and features that would be covered in each. Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

**Task 1-Task IV: Using Word** to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in Word.

## INTRODUCTION TO LATEX

## EXCEL

**Exercise 8** - **Excel Orientation:** The mentor needs to tell the importance of MS office 2007,2010/ equivalent tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

**Task 1-Task IV:** Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text, Formulas, Functions

## POWER POINT

**Exercise 9 - Task1:** Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this Exercise includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in Powerpoint. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

**Exercise 10 - Task 2:** Second Exercise helps students in making their presentations interactive. Topic covered during this Exercise includes : Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts

## **INTERNET & WORLD WIDE WEB 2 EXERCISES**

**Exercise 11 - Task 1**: **Orientation & Connectivity Boot Camp:** Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

**Web Browsers, Surfing the Web:** Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers.

**Exercise 12 - Task 2**: **Search Engines & Netiquette:** Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated by the student to the satisfaction of instructors.

**Cyber Hygiene:** Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install antivirus software, configure their personal firewall and windows update on their computer.

# **REFERENCES:**

- 1) Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
- 2) LaTeX Companion Leslie Lamport, PHI/Pearson.
- 3) Introduction to Computers, Peter Norton, 6/e Mc Graw Hill
- 4) Upgrading and Repairing, PC's 18th e, Scott Muller QUE, Pearson Education
- 5) Comdex Information Technology course tool kit, Vikas Gupta, WILEY Dreamtech
- 6) IT Essentials PC Hardware and Software Companion Guide, Third Edition by David Anfinson and Ken Quamme. – CISCO Press, Pearson Education.

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# (A1292151) UNIX LAB

## **COURSE OBJECTIVES:**

Students are expected to know most aspects of UNIX commands that are needed by a program developer or UNIX user, and some system administration. Although it is not required for this course, students are encouraged to install Linux on their personal computers.

## **LEARNING OUTCOMES:**

The student will be able to:

- ✤ Discuss the development of UNIX system over time.
- ✤ Use line and screen text editors with regular expressions.

## Week 1:

- a) Installation of Linux operating system.
- b) Learning User Interface of Linux.

## Week 2:

- a) Log into system.
- b) Using who, passwd, tty,set command.
- c) Using man, info command and its documentation.
- d) Using mkdir, ls, pwd, cd, echo, cat commands
- e) Log out of system.

## Week 3:

## Session-1

- a) Log into the system
- b) Use vi editor to create a file called *myfile.txt* which contains some text.
- c) Correct typing errors during creation.
- d) Save the file
- e) Logout of the system

# Session-2

- a) Log into the system
- b) Open the file created in session 1
- c) Add some text
- d) Change some text
- e) Delete some text
- f) Save the Changes
- g) Logout of the system

## Week 4:

- a) Log into system.
- b) Practicing general purpose utilities commands like lock, stty, script, clear, tput, uname, date, cal, calendar, bc.
- c) Learning about file permissions using chmod.
- d) Log out of system.

## Week 5:

- a) Log into the system
- b) Use the **cat** command to create a file containing the following data. Call it *mytable* use tabs to separate the fields.

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1425	Ravi	15.65
4320	Ramu	26.27
6830	Sita	36.15
1450	Raju	21.86

- c) Use the cat command to display the file, mytable.
- d) Use the vi command to correct any errors in the file, mytable.
  - Use the sort command to sort the file mytable according to the first field. Call the sorted file my table (same name)
- e) Print the file mytable
- f) Use the cut and paste commands to swap fields 2 and 3 of mytable. Call it my table (same name)
- g) Print the new file, mytable;
- h) Logout of the system.

## Week 6:

- a) Using the commands echo, tee.
- b) Using the files /dev/null and /dev/tty.
- c) Using the commands more, wc, od.

## Week 7:

a) Using the commands cmp, diff, comm, head, tail, cut, paste, sort, tr, uniq, nl, spell.

## Week 8:

- a) Write a C program to demonstrate fork() for creation of a process.
- b) Write a C program to demonstrate exex() function.
- c) Write a C program to demonstrate signal concept.

## Week 9:

- a) Execute hostname command to see computer name.
- b) To verify IP, display the contents in the file /etc/hosts.
- c) Use talk, mesg, finger commands for communication.

# Week 10:

Use telnet, rlogin, ftp commands for communication.

## **Text Books:**

- 1) Unix concepts and applications, Sumitabha Das, 4th Edition, TMH.
- 2) Introduction to UNIX & SHELL programming, M.G. Venkatesh Murthy, Pearson Education.
- 3) Unix for programmers and users, Gaham Glass & K. Ables, 3rd edition, Pearson education.
- 4) Unix and shell Programming –A text book, B.A. Forouzan & R.F. Giberg, Thomson.
- 5) Beginning shell scripting, E. Foster Johnson & other, Wiley, India.

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# (A0005152) PROFESSIONAL ENGLISH-II

## (Common to All Branches)

Professional English II has been prescribed with specific objectives of enlightening the learners in the arena of Language competence. The curriculum has been designed to sharpen the skills of the professional students to meet the job tasks and to sustain the global milieu. This skill based curriculum will mould the young learners as competent engineers.

## **OBJECTIVES:**

- Students will be able to read and explore for enrichment works from various genres (novels, plays, poems, essays).
- Students will be able to engage in formal writing assignments that require utilization of all stages of the writing process.
- Students will be able to evaluate their own language competence according to established criteria and rubrics like IELTS / TOEFL
- Students will be acquainted and be able to assess the LSRW skills.

## **OUTCOMES:**

## Students will be able to:

- Read and explore for enrichment works from various genre (Novels, Plays, Poems, Essays).
- ✤ Accomplish on line tasks
- ✤ Acquaint with soft skills and usage
- ◆ Understand and show respect for the diverse cultures, traditions & arts.

## UNIT I

## Practical English Usage II

- a) Review of Advance Grammar- Active & Passive Structures Reported speech
- b) Introduction to International English Language Testing System (IELTS) Level-2 Practice Tests – IELTS

## UNIT II

- a) Listening Skills Active Listening ROAR Technique Note Making
- b) **Autobiography** A Daughter is born from **I am Malala** by Malala with Christina Lamb

## UNIT III

- a) **Technical Writing** –II Design Led Documentation Online writing E mails Social Media – Netiquettes- Project Reports
- b) **Essay** *Green Living by* Neil Chambers

## UNIT IV

- a) Concept of Communication Process Principles
- b) **Prose** Immortal Speeches M.K.Gandhi

## UNIT V

- a) Introduction to Soft Skills Hard Skills vs Soft Skills Team Dynamics
- b) Soft Skill The Art of Time Management by Ramesh & Ramesh

## UNIT VI

- a) **Expression through Art** Fine Arts- Ravi Varma Paintings
- b) Project / Case Studies

**\*Text book Prescribed:** Falcon: Rise High, RGMCET Publication **REFERENCE BOOKS** 

- 1. The Ace of Soft SkillsbyGopala Swamy Ramesh & Mahadevan Ramesh, Pearson Education.
- 2. The Basics of Communication by Steven Duck, Sage Publication, New Delhi.
- 3. I am Malala by Malala Yousazai with Christina Lamb, Phoenex, 2014.
- 4. The Art of Public Speaking by Dale Carneige, Cosimo, Inc., 01-Nov-2007.

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## (A0006152) MATHEMATICS-II (Common to All Branches)

## **OBJECTIVES:**

To make aware students about the importance and symbiosis between mathematics and engineering. Achieve confidence with mathematical tools which an essential weapon in modern Graduate Engineer's Armory. Balance between the development of understanding and mastering of solution techniques with emphasis being on the development of student's ability to use Mathematics with understanding to solve engineering problems by retaining the philosophy learning by doing.

## **OUTCOMES:**

By the end of module students will be expected to demonstrate – knowledge of vector calculus, Fourier series, Fourier Transform, Z-transform and solve problems of engineering using these techniques.

## UNIT – I

**Multiple integrals:** – Double and triple integrals – Change of Variables – Change of order of integration.

## UNIT – II

**Vector Differentiation:** Introduction of Vector differentiation -Scalar and vector point functions-Gradient of scalar function– Directional derivatives- Divergence and curl of a vector function- properties of Grad, Div and Curl.

### UNIT – III

Vector integration – Line integral - Potential function – Area , Surface and volume integrals. Vector integral theorems: Green's theorem – Stoke's and Gauss's Divergence Theorem (excluding their proof). Verification of Green's – Stoke's and Gauss's Theorems.

## $\mathbf{UNIT} - \mathbf{IV}$

Fourier Series: Determination of Fourier coefficients – Fourier series of Even and odd functions – Fourier series in an arbitrary interval – Even and odd periodic continuation – Half-range Fourier sine and cosine expansions.

## $\mathbf{UNIT} - \mathbf{V}$

Fourier integral theorem (statement only) – Fourier sine and cosine integrals. Fourier transform – Fourier sine and cosine transforms – Properties – Inverse transforms.

## UNIT – VI

**Z-transform** – Inverse z-transform – Properties – Damping rule – Shifting rule – Initial and final value theorems. Convolution theorem – Solution of difference equations by z-transforms.

#### **TEXT BOOKS:**

- 1. Advanced Engineering Mathematics By Erwin Kreyszig.
- 2. Advanced Engineering Mathematics By R.K. Jain and S.R.K. Iyengar, Narosa Publications

#### **REFERENCES:**

- 1. A Text Book of Engineering Mathematics, Vol 1, T.K.V. Iyengar, B. Krishna Gandhi and Others S. Chand & Company.
- 2. Higher Engineering Mathematics by B.S.Grewal, Khanna Publishers.
- 3. A Text Book of Engineering Mathematics, Thomson Book Collection.
- 4. Engineering Mathematics By Srimantha Pal et.al. Oxford University Press.
- 5. Engineering Mathematics, Sarveswara Rao Koneru, Universities Press.

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# (A0008152) SOLID STATE PHYSICS

(Common to ECE, EEE, CSE & IT)

## **OBJECTIVES:**

The Solid State Physics (Physics-II) is designed to meet the educational needs of each student and to provide the foundation for future career development.

- To provide students with a broad education required to recognize, understand, and further the evolving role that materials science plays in society.
- To prepare students for careers in solid state physics and engineering, or in fields that require an understanding of materials, by providing a broad, fundamental view of materials as well as a solid foundation in science and engineering.
- To identify important scientific and engineering problems related to materials, and then design systems and processes as well as perform relevant experiments and interpret data to aid the solution of these problems;
- To understand and appreciate materials research and its application in advancing a wide range of established and emerging technologies.

## **OUTCOMES:** After the completion of the course the student will be able to:

- \* Know engineering material structures using the concepts crystal structures.
- Understand the origin of resistance and band structures with the study of conductors
- Understand the structure and behavior of semiconducting materials and devices.
- ✤ Apply the concepts of magnetism and superconductivity in electrical machines, inductors etc.
- ✤ Apply the concepts of dielectric behavior in the fabrication of capacitors.
- Motivate towards new small scale technology where the behavior of the materials is different.

## UNIT I:

**CRYSTAL PHYSICS:** Classification of solids - Lattice – Space lattice - Basis- Crystal Structure - Unit cell – Primitive cell – crystal systems - Bravais lattice –Atomic radius – Coordination number – Packing factor for SC, BCC, FCC structures – diamond and graphite structures - Lattice planes – Miller indices – inter planar spacing in a cubic lattice – X-Ray Diffraction - Bragg's law – Powder method of crystal structure determination - problems.

## UNIT II:

**CONDUCTING MATERIALS:** Conductors – classical free electron theory of metals – Drift Velocity - Electrical and thermal conductivity – Quantum theory – Fermi energy – Fermi level - Effect of temperature on Fermi Function - Fermi distribution function – Sources of electrical resistivity – Kroning-Penney model (qualitative results-no derivation) – Energy bands – Effective mass – classification of materials - problems.

## UNIT III:

**SEMICONDUCTING MATERIALS:** Introduction - Intrinsic semiconductor – extrinsic semiconductors – Drift and diffusion – Einstein relation - Hall effect – Determination of Hall coefficient – Applications – Direct and indirect band gap semiconductors – p-n junction – Band diagram of p-n junction – p-n junction under forward and reverse bias – energy band diagram - Diode equation – solar cell – Expressions for Vm and Im - problems.

## UNIT IV:

**MAGNETIC AND SUPERCONDUCTING PROPERTIES:** Terms and definitions - Origin of magnetic moment – Bohr magnetron – Dia and para magnetism – Ferro magnetism – Hysteresis – soft and hard magnetic materials – anti – ferromagnetic materials – Ferrites – applications - problems.

Introduction to superconductors - Properties of a superconductor - Meissner's effect - London penetration depth -Type of superconductors - BCS theory of Superconductivity (Qualitative) - Applications of superconductors - problems.

## UNIT V:

**DIELECTRIC PROPERTIES:** Matter polarization and relative permittivity: definition - dipole moment and polarization vector P - polarization mechanisms: electronic, ionic, orientational, interfacial and total polarization – frequency dependence - Lorentz field and Clausius - Mossotti equation - dielectric constant and dielectric loss - capacitor materials typical capacitor constructions - Ferro electricity - BaTiO<sub>3</sub> – applications – problems.

## UNIT VI:

## **MODERN ENGINEERING MATERIALS:**

**Nanomaterials**: Introduction - Properties - synthesis – ball milling - solgel - applications. **Carbon nanotubes**: introduction – types of CNTs - synthesis – chemical vapor deposition – properties and applications.Metallic glasses – shape memory alloys (one way, two way) – applications.

## **REFERENCES:**

- 1) Charles Kittel "Introduction to Solid State Physics", John Wiley & sons, 7<sup>th</sup> edition, Singapore.
- 2) Ali Omer, "Elementary Solid State physics", Person Publications 5th Edition, New Delhi.
- 3) M.N. Avadhanulu and PG Kshirsagar, "A Textbook of Engineering Physics", S.Chand and company, Ltd., New Delhi, 2014.
- 4) D. K. Bhattacharya and Poonam Tandon, "Engineering Physics", Oxford University Press, 2015.
- 5) Srivastava, "Elements of Solid State Physics", PHI, New Delhi.
- 6) Charles P. Poole and Frank J. Ownen, "Introduction to Nanotechnology", Wiley India.
- 7) S.P.Basavaraju, "Applied Physics", Subhas Stores, Bangalore.
- 8) M. Ratner & D. Ratner "Nanotechnology", Pearson Ed, New Delhi.

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# (A0003151) MODERN ENGINEERING CHEMISTRY (Common to All Branches)

## **OBJECTIVES:**

- To know the importance of water and sustainable utilization of water resources and alternative methods for potable water like Reverse osmosis and the problems raised in the Production of steam by using the boilers are included in Water technology.
- To identify the structure of organic molecules using photo chemistry and chemical spectroscopy.
- ✤ To acquaint the student with concepts of important photo physical and Photochemical processes and spectroscopy.
- To make the students conversant with basics of polymer chemistry
- To develop an understanding of the basic concepts of phase rule and its applications to single and two component systems.

◆ To Understand and apply the concepts in electrochemistry and corrosion science

## **OUTCOMES:**

- ✤ Apply the concepts of Organic chemistry for synthesis.
- Understand the synthesis and applications of Polymer science.
- Synthesize polymers.
- Estimate the hardness of water in terms of Calcium and magnesium ions.
- Standardize solutions using titration, conductivity meter and colorimeter.
- The students will come out with fundamentals of spectroscopy like electromagnetic spectrum, UV visible, IR spectroscopy.
- The properties and engineering applications of Abrasives and refractories will be useful for the student in the future.

## UNIT I:

**WATER TECHNOLOGY:** Sources of Water- Types of impurities in Water- Hardness of Water – Temporary and Permanent hardness - Disadvantages of hard water-Estimation of hardness by EDTA Method, Numerical Problems on Hardness.

Boiler troubles (Sludge, Scale, Caustic Embrittlement, Priming and foaming)-Softening of water (Ion exchange, Zeolite Methods).

Desalination-Reverse Osmosis Method.

Analysis of Water- Alkalinity Dissolved Oxygen.

## UNIT II:

## SURFACE CHEMISTRY:

Adsorption: Definition – Types-Langmuir Adsorption isotherm-Applications.

**Phase Rule:** Statement-Explanation of Terms involved with examples –One component System – Water & Sulphur Systems-Condensed Phase Rule- Pb-Ag System.

**Engineering Materials:** Abrasives –Mho<sup>,</sup> s Scale of Hardness-Natural &Synthetic Abrasives-Engineering Applications.

**Refractories:** Introduction, Classification & Properties Refractories-Reasons for failure of Refractories.

## UNIT III:

**ELECTRO CHEMISTRY:** Conductance – Specific Conductance -Equivalent Conductance – Molar Conductance-Determination of conductance by Wheat Stone Bridge Method-Effect of dilution On Conductance – Conductometric Titrations (Acid Base & Precipitative Titration)-Electrode Potential- Reference Electrodes (SHE, Calomel) - Nernst equation- Numerical Problems. Representation of Cell- electro chemical cells- concentration cells.

Ion Selective Electrode-Principle & Applications.

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Chemically Modified Electrodes (CMEs): CMEs as Potentiometric and amphereometric sensors.

## UNIT IV:

**CHEMISTRY OF CORROSSION & ITS PREVENTION:** Definition, Mechanism of Dry (oxidation),Wet (Evolution of hydrogen & Absorption of Oxygen) Types of corrosion- Dry Corrosion, and Wet Corrosion, Theories and Mechanism- Galvanic Series- Galvanic Corrosion, Concentration Cell Corrosion, Water line corrosion, Pitting Corrosion. Factors Influencing Corrosion.

Control of Corrosion - Proper designing and material selection-Cathodic Protection -

Sacrificial anode and Imprest Current methods. Use of Inhibitors.

**Protective coatings**: Metallic coatings & applications.

Electro Plating of Chromium & Nickel

## UNIT V:

**PHOTO CHEMISTRY&SPECTROSCOPY:** Photo Chemistry: Principles - Growthers Droppers law – Stark Einstein law-Lamberts Beers law-Flouroscence-Phosphorescence-Chemiluminiscence-Photosensitization-Quantum efficiency determination-problems

**Spectroscopy:** Electromagnetic spectrum-absorption of radiation-Electronic, Vibrational and Rotational Transitions.

UV-Visible and IR Spectroscopy Principles, Instrumentation (block diagrams) & applications (Qualitative)

## UNIT VI:

## POLYMERS AND FUELS:

**Polymer:** Basic concepts- Types of Polymerization – Addition and Condensation Polymerization. Mechanism of Addition polymerization.

**Plastics**: Definition, Thermo& plastics. Preparation, Properties and Engineering Uses of Poly ethylene, Poly vinyl chloride, Teflon, Bakelite,& Nylons.

**Elastomers**: Processing of Natural Rubber, Compounding of Rubber Drawbacks of Raw Rubber, Vulcanization of Rubber. Preparation, Properties & Uses of Buna-S, Buna-N, Silicone Rubber.

**Fuels**: Definition, Classification of fuels. Characteristics of a good fuel. Calorific Value and its Units. Determination Calorific Value by Bomb Calorimeter.

Solid Fuel: Analysis of Coal (Proximate & Ultimate)

Liquid Fuels: Petroleum, Refining, Knocking, Octane, Cetane Number.

Gaseous Fuels: Producer Gas, Water Gas.

Combustion: Principles and Numerical Problems- Flue gas analysis by Orsat's apparatus.

## TEXT BOOKS:

- 1) Text book of Engineering Chemistry by Jain & Jain, Dhanpat Rai Publishing Company, 15th edition New Delhi (2008).
- 2) Text book of Engineering Chemistry by sashi chawla, Dhanpat Rai Publishing Company, 12th edition New Delhi (2011).

## **REFERENCE**:

- 1) A text book of Engineering Chemistry by S.S. Dara, S.Chand & Co, New Delhi (2008)
- 2) Dara S.S Text Book Of Engineering Chemistry, S.Chand & Company Ltd, NewDelhi 2003.
- 3) Chemistry of Engineering Materials by C.V. Agarwal, Tara Publication, Varanasi.2008.
- 4) Physical Chemistry Glasston & Lewis.

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# (A0502152) DATA STRUCTURES THROUGH C

(Common to All Branches)

## **OBJECTIVES:**

- ✤ To make students aware about structures and unions in C language.
- To provide exposure on various searching and sorting techniques.
- To provide exposure on various data structures like stacks, queues, circular queues and linked lists etc.,
- $\clubsuit$  To develop solutions for various problems by using C Programming Language by students.

## **OUTCOMES:**

By the end of this course, students should be able

- To understand how to develop C programs to solve various kinds of problems by using different C programming concepts like structures and unions.
- ✤ To develop programs by performing I/O operations through Files.
- To implement different linear data structures like stacks, queues, circular queues and linked lists etc.,
- ✤ To implement various searching and sorting techniques.

## UNIT I

**STRUCTURE AND UNIONS IN C LANGUAGE: Structures** – Introduction, Features of Structures. Declaration and Initialization of Structures, Accessing structure members, structure initialization. Nested Structures, Array of Structures, Arrays within structures and Pointers to Structures, Structures and Functions, Bit Fields, Unions, Union of Structures. Example Programs on the topics mentioned above.

## UNIT II

**FILE INPUT/OUTPUT**: Introduction, Types of Files, File I/O Operations- High level I/O functions- Open & Close a file, Read and Write data into a file, Searching data in the file, Error handling during I/O operations on files. Command Line Arguments, Applications of Command Line Arguments. Example Programs on the topics covered in this unit.

## UNIT III

**INTRODUCTION TO DATA STRUCTURES:** classification of data structures, dynamic memory allocation functions in C language. **Stacks:** Definition, Various representation methods, operations on stacks and their implementation in C language, applications of stacks.

## UNIT IV

**QUEUES:** Definition, Various representation methods, operations on queues and their implementation in C language, applications of queues. Circular queues- operations on circular queues and their implementation in C language.

## UNIT V

**LINKED LISTS:** Definition, Various representation methods, operations on linked lists and their implementation in C language.

## UNIT VI

## SEARCHINGAND SORTING TECHNIQUES:

**Searching Techniques**- Linear search and Binary Search Techniques.

**Sorting techniques** - Bubble Sort, Selection Sort, Quick Sort, Insertion Sort, and Merge Sort. Implementation of all the above mentioned techniques in C language and trace them by giving different test data.

# TEXT BOOKS:

- 1. Programming in C, Pradeep Dey, Manas Ghosh, Oxford Heigher Education
- 2. Computer programming and Data Structures, E.Balaguruswamy, Tata Mc Graw Hill. 2009 revised edition.
- 3. The C Programming Language, Brian W.Kerninghan, Dennis M.Ritchie
- 4. Programming in C , Dr. N. Uday Bhaskar, Winger publications

# **REFERENCES:**

- 1. Let us C Yeshwanth kanetkar, 8th Edition.BPB Publications
- 2. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
- 3. Data Structures using C A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education / PHI, Eighth Edition.
- 4. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.

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# (A0401151) FUNDAMENTAL OF ELECTRONIC DEVICES (Common to EEE & IT)

## **OBJECTIVES:**

- To understand the basic materials used for fabrication of different semiconductor devices.
- To understand construction details, principle of operation and equivalent electrical model of each device.
- Evolution of different diodes based on doping levels.

## **OUTCOMES:**

- Students are capable of identifying a particular device for different applications.
- Students are able to understand that all the devices are basically two state devices (Switches).
- Students are capable of using two junction device as an amplifying device.

## UNIT-I

**ELECTRONICS DYNAMICS AND CRO**: Motion of charged particles in electric and magnetic fields. Simple problems involving electric and magnetic fields only. Electrostatic and magnetic focusing. Principles of CRT, deflection sensitivity (Electrostatic and magnetic deflection). Application of CRO, Voltage, Current and Frequency Measurements.

## UNIT- II

**SEMICONDUCTOR DIODE CHARACTERISTICS:** Review of PN Junction Diode. V-I characteristics of PN diode, Static and Dynamic resistances, Temperature dependence of parameters(Derivation not necessary)Diode equivalent circuits, Diode capacitances, Breakdown Mechanisms in Semiconductor Diodes, Zener diode characteristics, small signal equivalent circuit of PN diode

## UNIT- III

**RECTIFIERS, FILTERS AND REGULATORS:** PN Junction as a Rectifier, Half wave rectifier, ripple factor, Efficiency, regulation and Transformer utilization factor (TUF). Full wave rectifier, Bridge rectifier. Filters: Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L-Section filter, P- Section filter, comparison of various filter circuits, Simple circuit of a regulator using Zener diode.

## UNIT-IV

**BIPOLAR JUNCTION TRANSISTORS (BJT):** Study of operation of BJT, Detailed study of currents in a transistor, Input and Output characteristics of transistor in CB, CE, and CC configurations, Relation between Alpha, Beta and Gamma. Operation and characteristics of UJT.

## UNIT-V

**JUNCTION FIELD EFFECT TRANSISTORS (JFET):** Construction, operation and transfer and output characteristics, Pinch-Off voltage, construction of MOSFET and its characteristics (Enhancement and depletion mode), Comparison of Transistors BJT,UJT, FET, and MOSFET.

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# UNIT-VI

**SPECIAL PURPOSE DEVICES:** Principle and operation of Schottky Barrier Diode, SCR, DIAC, TRIAC, Avalanche photo diode, LED and Tunnel Diode with the help of energy band diagrams.

## **TEXT BOOKS:**

- 1. Electronic Devices and Circuits J.Millman, C.C.Halkias, Tata McGraw Hill, 2nd Ed., 2007.
- 2. Electronic Devices and Circuits R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 9th Edition, 2006.
- Electronic Devices and Circuits- David A. Bell, Oxford University Press, 5<sup>th</sup> Edition, 2008.

## **REFERENCES:**

- 1. Electronic Devices and Circuits T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6<sup>th</sup> edition, 2004.
- Principles of Electronic Circuits S.G.Burns and P.R.Bond, Galgotia Publications, 2<sup>nd</sup> Edn., 1998.
- 3. Microelectronics Millman and Grabel, Tata McGraw Hill, 1988.
- Electronic Devices and Circuits Dr. K. Lal Kishore, B.S. Publications, 2<sup>nd</sup> Edition, 2005.
- 5. Electronic Devices and Circuits- Prof GS N Raju I K International Publishing House Pvt. Ltd 2006.

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## (A0091151) ENGINEERING CHEMISTRY LAB (Common to All Branches)

## **OBJECTIVES:**

Chemistry is one subject which gives adequate knowledge about the applications involved in the aerospace, mechanical, environmental and other engineering fields. Knowledge of chemistry plays a vital role in engineering profession enabling the potential engineers to understand and to perform successfully while working on multidisciplinary tasks.

The main objective of the department is to develop the necessary theoretical and practical aspects required for understanding intricacies of the subject and also give adequate exposure to the applied chemistry aspects in different disciplines of engineering. Our faculty educates the engineering students with all necessary concepts related to chemistry and develops a scientific attitude by means of distinguishing, analyzing and solving various engineering problems. We are training the students to develop their experimental skills and important practical knowledge in engineering by providing sophisticated chemistry laboratory.

## **OUTCOMES:**

- 1) The analysis of water and know the importance of utility of water and the limits of impurities present in water for potable purpose.
- 2) Skill and keen observation will be developed and it will be helpful in future engineering labs.
- 3) They know importance of plastic materials and know the synthetic applications.

## **Detailed Syllabus:**

1) Standardization of KMnO<sub>4</sub> By using Mohr's salt.

## **Complexometric Titrations:**

- 2) Determination of Hardness of water by using EDTA titration method.
- 3) Estimation of Magnesium ion by using EDTA titration method.
- 4) Estimation of copper ion by using EDTA titration method.
- 5) Estimation of dissolved oxygen by Winkler's Method.

## **Dichrometry:**

6) Determination of Ferrous ion by using potassium dichromate.

## **Conductometric titration:**

- 7) Determination of Strength of the given HCL by using Conductometric titration.
- 8) Determination of Strength of the given  $CH_3COOH$  by using Conductometric titration.
- 9) Determination of Alkalinity Present in a given solution.
- 10) Verification of Beer's-Lambert's Law by KMnO<sub>4</sub>.
- 11) Determination of Strength Manganese by Colorometric Method
- 12) Determination of Calorific Value of Solid/Liquid fuel using Bomb Calorimeter.
- 13) Determination of Viscosity by using Red wood Viscometer-I (or) II
- 14) Potentiometric Determination of iron using StandardK<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> Solution.

## **Demonstration:**

- 15) Determination of Bulk density.
- 16) Determination of Refractive index of a given Solution.
- 17) Preparation of Ethyl Acetate.
- 18) Preparation of Bakelite.
- 19) Determination of pH of Water and various other samples.

## **REFERENCES:**

- 1) Laboratory Manual on Engineering Chemistry, Sudharani (Dhanpat Rai Publishing Company).
- Vogel's Textbook of Quantitative chemical analysis, J. Mendham et.al. (Pearson Education).
   Advanced Inorganic Analysis, Agarwal & Keemtilal, Pragati prakashan.
- 4) Chemical tables, Dr N. S. Gnanapragasam, (Sultan Chand & sons).

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# (A0592152) DATA STRUCTURES THROUGH C LAB

(Common to All Branches)

## **OBJECTIVES:**

- To introduce different constructs of C language like structures and unions to the students to solve various kinds of problems.
- To introduce different types of linear data structures like stacks, queues, circular queues and linked lists etc.
- To make the students to implement different kinds of sorting algorithms like selection sort, bubble sort, insertion sort, and quick sort and merge sort etc.
- To make the students to implement different kinds of searching algorithms like linear search and binary search etc.
- To implement various searching and sorting techniques

## **OUTCOMES:**

By the end of this course, students should be able

- To understand how to develop C programs to solve various kinds of problems by using different C programming concepts like structures and unions.
- ✤ To develop programs by performing I/O operations through Files.
- To implement different linear data structures like stacks, queues, circular queues and linked lists etc.,
- To implement various searching and sorting techniques.

## **RECOMMENDED SYSTEMS /SOFTWARE REQUREMENTS:**

Intel based desktop PC with ANSI C Compiler and Supporting Editors

## Exercise 1:

- a) Write a C Program to copy the contents of one structure variable to another structure variable.
- b) Write a C program to implement nested structure to store and display the student information. The structure student contains the field's S.no, name, and date. Date is the nested structure and it contains the fields day, month and year.

## Exercise 2:

- a) Write a C program to simulate the multiplication of two fractions by passing individual structure members to a function.
- b) Write a C program to simulate the multiplication of two fractions by passing the whole structure to a function.

## Exercise 3:

- a) Write a C program that uses functions to perform the following operations:
  - i) Reading a complex number
  - ii) Writing a complex number
  - iii) Addition of two complex numbers
  - iv) Multiplication of two complex numbers (Note: represent complex number using a structure.)
- b) Write a C program to implement Union Concept.

## Exercise 4:

- a) Write a C program which copies last 'n' characters from one file to another.
- b) Write a C program to reverse the first 'n' characters in a file.
- c) Write a C program to merge two files into a third file.

## Exercise 5:

Write a C program to implement the following operations on Stack using array representation

a) Push b) Pop c) Display

#### Autonomous INFORMATION TECHNOLOGY

## Exercise 6:

Write a C program to implement the following operations on Queue using array representation

a) Insert b) Delete c) Display

## Exercise 7:

Write a C program to implement the following operations on Singly Linked list using linked representation

a) Insert

b) Delete c) Display d) Search

## Exercise 8:

Write a C program that implements the following sorting methods to sort a given list of integers in ascending order.

a) Bubble sort b) Selection sort c) Insertion sort

## Exercise 9:

Write a C program that implements the following sorting methods to sort a given list of integers in ascending order.

a) Quick Sort b) Merge sort

## Exercise 10:

Write C program to implement the following searching methods to search an element in a given list of integers

a) Linear Search b) Binary Search

## **REFERENCE BOOKS**

- 1. Programming in C, Pradeep Dey, Manas Ghosh, Oxford Heigher Education
- 2. Computer programming and Data Structures, E.Balaguruswamy, Tata Mc Graw Hill. 2009 revised edition.
- 3. Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publications.

# Autonomous INFORMATION TECHNOLOGY

I B.Tech, II-Sem (IT)

P C 3 2

**RGM-R-2015** 

# (A0391151) ENGINEERING WORKSHOP (Common to all branches)

## **OBJECTIVES:**

The budding Engineer may turn out to be a technologist, scientist, entrepreneur, practitioner, consultant etc. There is a need to equip the engineer with the knowledge of common and newer engineering materials as well as shop practices to fabricate, manufacture or work with materials. Essentially he should know the labor involved, machinery or equipment necessary, time required to fabricate and also should be able to estimate the cost of the product or job work. Hence engineering work shop practice is included to introduce some common shop practices and on hand experience to appreciate the use of skill, tools, equipment and general practices to all the engineering students.

## **OUTCOMES:**

✤ At the end of the Engineering Work Shop: A Student involved in acquiring manufacturing skills must have balanced knowledge of theory as well as practice. The First students of all engineering branches should know the basic knowledge of various tools and their use in different sections of manufacturing such as fitting, carpentry, tin smithy, welding etc. and basic engineering practices such as plumbing, electrical wiring, electronic circuits, machine shop practice

**Note:** At least two exercises to be done from each trade.

## **1. TRADES FOR EXERCISES:**

A] Carpentry	1. T-Lap Joint 3. Dovetail Joint	<ol> <li>Cross Lap Joint</li> <li>Mortise and Tennon Joint</li> </ol>
B] Fitting	1. Vee Fit 3. Half Round Fit	<ol> <li>Square Fit</li> <li>Dovetail Fit</li> </ol>
C] House Wiring	<ol> <li>Parallel / Series Connection</li> <li>Stair Case wiring</li> <li>Measurement of Earth Res</li> </ol>	on of two/three bulbs 3 Tube Light Wiring sistance/Go down Wiring
D] Tin Smithy	1. Rectangular Tray 3. Open Scoop	<ol> <li>Square Box without lid</li> <li>Funnel</li> </ol>
E] Welding	<ol> <li>Single V butt joint</li> <li>Double V butt joint</li> </ol>	<ol> <li>2. Lap joint</li> <li>4. T fillet joint.</li> </ol>
F] Soldering	<ol> <li>Soldering &amp; Desoldering Pr</li> <li>Series Circuit</li> <li>Parallel Circuit</li> </ol>	actice

## 2. TRADES FOR DEMONSTRATION:

- a) Plumbing
- b) Machine Shop
- c) Bosch Power Tools

## **REFERENCE BOOKS:**

- 1. Engineering Work shop practice for JNTU, V. Ramesh Babu, VRB Publishers Pvt. Ltd., 2009.
- 2. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers.
- 3. Engineering Practices Lab Manual, Jeyapoovan, Saravana Pandian, 4/e Vikas.
- 4. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.

I B.Tech, II-Sem (IT)

P C 3 2

# (A0092151) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB (Common to all Branches)

English Language Lab acts as a platform for learning, practicing and producing language skills through interactive lessons and communicative mode of teaching. Communicative method for learning languages combines extensive, high-quality content with flexible and interactive multimedia technology. Learners can act and respond in a variety of ways at their own pace. Through a wide range of activities, a variety of skills are aimed to develop in a learner. A learner needs to communicate: oral and written comprehension, as well as oral and written expression. It also addresses the concepts of grammar, lexicon, phonetics and conjugation.

## **OBJECTIVES:**

- ✤ To develop language learning through accuracy in grammar
- To enrich the discourse competence, to prepare the learner to be able to produce contextualize written text and speech.
- ✤ To achieve good pronunciation patterns and accent.
- To acquire strategic competence to use both spoken & written language to use in a wide range of communication strategies.

## **OUTCOMES:**

- Students will be able to
- Participate actively and effectively in cooperative groups
- Use computers and all available technology to enhance their communication skills
- Acquainted with pronunciation patterns and accent
- Deliver a clear, coherent oral presentation using information and diction suitable for subject, purpose, and audience.

## UNIT I

**Functional English** – self Introduction - Greetings – Requests – seeking information - Invitations -Ice breaking activities

## UNIT II

## Multi Media Lab Practice

Introduction to Phonetics I - Speech sounds -Vowels - Diphthongs - Consonants

## UNIT III

## Multi Media Lab Practice

Phonetics II- Word Accent - Intonation - Rhythm

## UNIT IV

Information Transfer - Activity -Description of Technical Objects

## UNIT V

**Oral Presentations** - Activity – JAM

## UNIT VI

## **Group Communication** – Activity – GD/Role plays

## Outcomes:

Students will be able to

- 1. Participate actively and effectively in cooperative groups
- 2. Use computers and all available technology to enhance their communication skills
- 3. Acquainted with pronunciation patterns and accent
- 4. Deliver a clear, coherent oral presentation using information and diction suitable for subject, purpose, and audience.

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## Licensed Soft ware available in the Language Lab:

- K-VAN , SOFTX Technologies: English Language and Communication Skills Soft ware IV.0
- Alania Series, English Mastery, Visual & Media Works:Listening Comprehension Grammar – Vocabulary
- ✤ Rosetta Stone Soft ware, Visual & Media Works: LSRW Skills
- EL Client, Globerena Technologies: Phonetics Job Skills
- \* K-VAN Solutions: Advanced Communication Skills Lab Soft ware.

## **Reference Books:**

- 1. Better English Pronunciation by J.D. O' Connor, Cambridge University Press, 1980
- 2. Longman Dictionary of Contemporary English for Advanced Learners, Pearson Education Ltd.
- 3. Speak with Power and Confidence: Tested Ideas for Becoming a More Powerful Communicator by Patric Collins , 2007
- 4. Professional Communication Skills , by Praveen S.R. Bhatia (Author), A.K. Jain (Author), A.M. Sheikh (Author), 2006.

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# Autonomous INFORMATION TECHNOLOGY

II B.Tech, I-Sem (IT)

T C 3+1\* 3

# (A0015153) MATHEMATICAL METHODS (Common to CE, EEE, ME, ECE & IT)

## **OBJECTIVES:**

✤ To make aware students about the importance and symbiosis between mathematics and engineering. Achieve confidence with mathematical tools which an essential weapon in modern Graduate Engineer's Armory. Balance between the development of understanding and mastering of solution techniques with emphasis being on the development of student's ability to use Mathematics with understanding to solve engineering problems by retaining the philosophy learning by doing.

## **OUTCOMES:**

By the end of module students will be expected to demonstrate understanding of Matrices, Partial Differential Equations and Numerical Methods are used to solve various Engineering Problems.

## UNIT – I

**Matrices:** Elementary row transformations – Rank – Echelon form, Normal form – Solutions of Linear System of Homogenous and Non Homogeneous equations

Eigen Values, Eigen vectors – Properties. Cayley – Hamilton Theorem – Inverse and powers of a matrix by Cayley–Hamilton theorem

## UNIT – II

Real matrices – Symmetric, skew – Symmetric, orthogonal matrices.

**Complex matrices:**Hermitian, Skew-Hermitian and Unitary matrices – Eigen values and Eigen vectors and their properties. Quadratic forms –Linear Transformation – Reduction of quadratic form to canonical form and their nature(Signature and Index).

## UNIT – III

Solution of Algebraic and Transcendental Equations: Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.

**Interpolation:** Introduction – Finite differences – Forward Differences – backward Differences –Newton's forward and backward difference formulae for interpolation – Lagrange's Interpolation formula.

## $\mathbf{UNIT} - \mathbf{IV}$

Curve fitting: Fitting a straight line – Second degree curve – Exponential curve-Power curve by method of least squares.

Numerical Differentiation and Integration – Trapezoidal rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule.

## UNIT – V

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method-Runge-Kutta Method- Milne's Predictor-Corrector Method.

## $\mathbf{UNIT} - \mathbf{VI}$

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Method of separation of variables – Solutions of one dimensional wave equation, heat equation and two-dimensional Laplace equation under initial and boundary conditions

## TEXT BOOKS:

- 1. Advanced Engineering Mathematics By Erwin Kreyszig.
- 2. Advanced Engineering Mathematics By R.K. Jain and S.R.K. Iyengar, Narosa Publications.

## **REFERENCES:**

- 1. A Text Book of Engineering Mathematics, Vol 1, T.K.V. Iyengar, B. Krishna Gandhi and Others S. Chand & Company.
- 2. Higher Engineering Mathematics by B.S.Grewal, Khanna Publishers.
- 3. A Text Book of Engineering Mathematics, Thomson Book Collection.
- 4. Engineering Mathematics BySrimantha Pal et.al. Oxford University Press.
- 5. Engineering Mathematics, SarveswaraRaoKoneru, Universities Press.

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# **INFORMATION TECHNOLOGY**

II B.Tech, I-Sem (IT)

T C 3+1\* 3

# (A1202153) FOUNDATIONS OF SOFTWARE ENGINEERING

# **OBJECTIVES:**

The objective of this course is to teach students.

- To introduce software engineering and to explain its importance in building large programs.
- $\clubsuit$  To understand the process of developing new technology and the role of experimentation.
- ✤ To set out the answers to key questions about software engineering.
- To introduce ethical and professional issues and to explain why they are of concern to software engineers.

## **OUTCOMES:**

The student should be able to:

- The ability to analyze, design, verify, validate, implement, apply, and maintain software systems.
- Plan a software engineering process to account for quality issues and non-functional requirements.
- Demonstrate knowledge of the wider software engineering context, software engineering processes and their applicability.
- ✤ Interact with a client to elicit input, and communicate progress.

## UNIT I

**INTRODUCTION:** The Problem Domain, the Software Engineering Challenges, The Software Engineering Approach, Software Process, Desired Characteristics of Software Process (Chapter1and Part of Chapter 2)

## UNIT II

**PROCESS MODELS AND REQUIREMENTS:** Software Development Process Models, Software Requirements, Requirements Specification, Validation, Metrics (Remaining part of Chapter 2 and part of Chapter 3)

## UNIT III

**PROCESS PLANNING:** Effort Estimation, Risk Management, Software Configuration Management Plan, Project Scheduling and Staffing, Project Monitoring Plan(Chapter 5)

# UNIT IV

**DESIGN:** Function-Oriented Design: Design Principles, Module-Level Concepts, Design Notation and specification Design Methodology. Detailed Design: Detailed Design and PDL (6.1-6.3, 7.3-7.5, 8.1-8.3)

## UNIT V

**CODING:** Programming Principles and Guidelines, Coding Process, Refactoring, Verification, Metrics (Chapter 9)

## UNIT VI: TESTING

Testing Fundamentals, Black-Box Testing, White-box Testing, Testing Process, Defect Analysis and Prevention, Metrics—Reliability Estimation (Chapter 10)

## TEXT BOOKS:

1. An Integrated Approach To Software Engineering, by PakajJalote, 3rd Edition, Narosa Publishing House. ISBN: 978-81-7319-702-4, 2013

## **REFERENCE BOOKS:**

- 1. Software Engineering: A Practitioner's Approach, Roger S. Pressman, 6th edition, Mc-Graw Hill, *ISBN*-10: 007301933X.
- 2. Software Engineering, by Ian Sommerville, 7th edition, Addison Wesley, ISBN-10: 0321210263, 2004.

## Autonomous INFORMATION TECHNOLOGY

II B.Tech, I-Sem (IT)

T C 3+1\* 3

RGM-R-2015

# (A1203153) FUNDAMENTALS OF OBJECT ORIENTED DESIGN

## **OBJECTIVES:**

- To create good object-oriented designs prior to coding using the fundamentals, notations, principles of object oriented software design (OOSD)
- To depict & given scope for learning about classes along with their attributes, and operations
- ✤ To provide scope for learning of different relationships in classes such as association, aggregate, generalization
- Building a working knowledge of object-oriented programming

# **OUTCOMES:**

The student should be able to

- Design object-oriented solutions from unified modelling language specifications.
- ✤ Map object-oriented designs in UML to a specific object-oriented language.
- Organize and contribute to team programming projects.

## UNIT 1

**Introduction:** What is Object oriented approach Overview of prerequisite if any or introduction, Encapsulation, Information Hiding, State Retention, Object Identity, Messages, Classes, Inheritance, Polymorphism, and Generosity. [*Chap.1*]

## UNIT 2

## The Unified Model Language-1:

**Basic expression of Class, Attributes, and Operations**: The class, attributes operations, overloaded operations, visibility of attributes and operations, class attributes and operations, abstract operations and classes, The utility, parameterized classes

 Class Diagrams:
 Generalization
 construct,
 Association
 Whole/Part

 association
 [Chap 3 & 4]
 [Chap 5 & 4]

## UNIT 3

## The Unified Model Language-2:

**Object interaction Diagrams**: Collaboration diagrams, sequence diagrams, Asynchronous messages and concurrent execution;

**State diagrams**: Basic state diagram, Nested classes, concurrent states and synchronization, taransient state from message result Arguments and continuously variable attributes [Chaps 5, 6]

## UNIT 4

Principles of OOD-1:Encapsulation and Connascence;Encapsulation structure,Connascence Domains, Encumbrance, Cohesion:Domains of Object classes, Encumbrance,class cohesion – A class and its features[Chap 8, 9]

## UNIT 5

## **Principles of OOD-2:**

**State-space and behaviour**: State space and Behaviour of a class, subclass, The class invariant as a restriction on a State-Space,

Type conformance and closed behaviour:Class verses Type, principles of typeconformance, The principles of Closed behavior.[Chap 10, 11]

# UNIT 6

# **Principles of OOD-3:**

Perils of inheritance and polymorphism: Abuses of inheritance, Danger of Polymorphism, polymorphism in messages, polymorphism and genericity

Designing a software component: What is a component?, Similarities and dissimilarities between component and object & examples, Internal design of a component and light weight and heavy weight components & advantages [Chap 12, 15]

## **Text Book:**

1. Fundamentals of Object-Oriented Design in UML, Meilir Page-Jones, 6<sup>th</sup> impression 2009, Pearson Education.

## **Reference Books:**

- 1. The Unified Modeling Language User Guide, Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.
- 2. UML 2 Toolkit, Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, WILEY-Dreamtech India Pvt. Ltd.
- 3. Modeling Software Systems Using UML2, Pascal Roques, WILEY-Dreamtech India Pvt. Ltd.
- 4. Object Oriented Analysis & Design, Atul Kahate, The McGraw-Hill Companies.
- 5. Practical Object-Oriented Design with UML, Mark Priestley, Tata McGrawHill
- 6. Appling UML and Patterns: An introduction to Object Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.

# Autonomous INFORMATION TECHNOLOGY

II B.Tech, I-Sem (IT)

Т	С
3+1*	3

RGM-R-2015

# (A0430153) DIGITAL LOGIC DESIGN (Common for CSE & IT)

## **OBJECTIVES:**

- ✤ Understand the different number system, its conversions and binary arithmetic.
- Know the fundamentals of Boolean algebra and theorems, Karnaugh maps including the minimization of logic functions to SOP or POS form.
- Analysis of logic circuits and optimization techniques to minimize gate count, signals, IC count, or time delay.
- To strengthen the principles of logic design and use of simple memory devices, flipflops, and sequential circuits.
- To fortify the documentation standards for logic designs, standard sequential devices, including counters and registers.

To understand design of logic functions using PLDs (ROM, RAM, PAL, PLA).

## **OUTCOMES:**

- ✤ Ability to differentiate between analog and digital representations.
- Ability to convert a number from one number system to its equivalent in of the other number system.
- Cite the advantages of the octal and hexa-decimal number systems and to understand the difference between BCD and straight binary.
- Ability to perform the three basic logic operations and construct the truth tables for the different types of gates. And Implement logic circuits using basic AND, OR and NOT gates.
- Ability to Use De-Morgan's theorem to simplify logic expressions and describe the concept of active LOW and active HIGH logic signals and Use Boolean algebra and K-map as tool to simplify and design logic circuits and Design simple logic circuits without the help of truth tables.
- Ability to Construct and analyse the operation of flip-flop and troubleshoot various types of flip-flop circuits.

## UNIT I:

**BINARY SYSTEMS:** Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes, Binary Storage and Registers, Binary logic.

## UNIT II:

**BOOLEAN ALGEBRA AND LOGIC GATES:** Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions canonical and standard forms, other logic operations, Digital logic gates, and their integrated circuit numbers.

## UNIT III:

**GATE – LEVEL MINIMIZATION:** The map method, Four-variable map, Five-Variable map, product of sums simplification Don't-care conditions, NAND and NOR implementation other Two-level implementations, Exclusive – OR function,

## UNIT IV:

**COMBINATIONAL LOGIC:** Combinational Circuits, Analysis procedure Design procedure, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, Introduction to HDL,VHDL code for basic and universal logic gates, Half adder ,full adder circuits.

## UNIT V:

**SYNCHRONOUS SEQUENTIAL LOGIC**: Sequential circuits, latches, Flip-Flops Analysis of clocked sequential circuits, State Reduction and Assignment, Design Procedure.

**ASYNCHRONOUS SEQUENTIAL LOGIC**: Introduction, Analysis Procedure, Circuits with Latches, Design Procedure.

## UNIT VI:

Registers, shift Registers, Ripple counters synchronous counters, other counters, Introduction, Random-Access Memory, Memory Decoding, Error Detection and correction Read-only memory, Programmable logic Array programmable Array logic, Sequential Programmable Devices. VHDL code for Flip-flops, decade counter.

## **TEXT BOOKS:**

- 1. Digital Design, M .Morris Mano, 3rd edn. Pearson Education/PHI.
- 2. Fundamentals Of Logic Design, Roth, 5th edn., Thomson.

## **REFERENCE BOOKS:**

- 1. Switching and Finite Automata Theory, Zvi. Kohavi, Tata McGraw Hill.
- 2. Switching and Logic Design, C.V.S. Rao, Pearson Education
- 3. Digital Principles and Design, Donald D.Givone, 2ndEdition Tata McGraw Hill
- 4. Fundamentals of Digital Logic & Micro Computer Design, M. Rafiquzzaman, 5th edn. John Wiley.

## Autonomous INFORMATION TECHNOLOGY

II B.Tech, I-Sem (IT)

T C 3+1\* 3

**RGM-R-2015** 

# (A1204153) MATHEMATICAL FOUNDATIONS OF IT

## **OBJECTIVES:**

By the course-end the student will be able to understand:

- To learn Fundamental concepts of set theory, Functional and relational properties and operations, Boolean algebra.
- To get Basic probability theory and applications, counting principles.
- To learn Recursive definitions and solutions of simple of recurrence relations and generating functions.
- To practice Graph algorithms and their application to computer science.
- ✤ To learn Fundamentals of Group theory, Rings and their applications.
- ✤ To learn formal languages and grammars

## **OUTCOMES:**

The student will be able to:

- Read, understand and apply definitions and theorems in basic discrete mathematics;
- Formulate simple definitions, examples and proofs in discrete mathematics;
- To know the formal languages and automata theory

## UNIT I

**MATHEMATICAL LOGIC:** Statements and notations, connectives, well-formed formulas, tautologies, equivalence of formulas, Tautological Implications, other connectives, Normal forms, Rules of inference, consistency of premises and indirect method of proof, Predicates, the statement function, variables and quantifiers, predicate formula, free and bound variables, universe of discourse, inference theory of the predicate calculus.

# UNIT II

**PREDICATE LOGIC: Predicate Calculus:** Predicates, Statement formulas, variables, quantifiers, Predicate formulas, Free & Bound variables, Universe of discourse. Inference theory: valid formulas, equivalence, Rules of inference, Consistency, proof of contradiction. **UNIT III** 

**SET THEORY:** Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse diagram. Functions: Inverse Function Comports of functions, recursive Functions, Lattice and its Properties, Pigeon hole principles and its application

# UNIT IV

**ALGEBRAIC STRUCTURES AND RECURRENCE RELATIONS:** Algebraic systems Examples and general properties, Semi groups and monoids, groups sub groups' homomorphism, Isomorphism Recurrence Relations: Generating Functions, Function of Sequences Calculating Coefficient of generating function, Recurrence relations

## UNIT V

**GRAPH THEORY -1:** Basic Concepts- Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs Isomorphism and Sub graphs, Operations on graphs, walk and connected graphs.

## UNIT-VI

**GRAPH THEORY-2:** Multi-graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers. Planar and nonplanar graphs. Graph and map coloring

## **TEXT BOOKS:**

- 1. Discrete Mathematical Structures with applications to computer science Trembly, J.P. & Manohar .P, First Edition, TMH.
- 2. Mathematical Foundations of Computer Science, Chandrasekhar D.S, Prism Books Pvt Ltd, 2011.

## **REFERENCE BOOKS:**

- 1. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition.TMH.
- 2. Discrete Mathematical Structures, BernandKolman, Roberty C. Busby, Sharn Cutter Ross, Pearson Education/PHI.
- 3. Discrete Mathematics for Computer science, Garry Haggard and others, Thomson.

# Autonomous INFORMATION TECHNOLOGY

II B.Tech, I-Sem (IT)

Т	С
3+1*	3

RGM-R-2015

# (A1205153)ALGORITHMS AND DATA STRUCTURES

# **OBJECTIVES:**

The objective of this course is to teach students various data structures and to explain the algorithms for performing various operations on these data structures. The course aims are:

- Demonstrate familiarity with major algorithms and data structures.
- ✤ Analyze performance of algorithms.
- Choose the appropriate data structure and algorithm design method for a specified application.
- Determine which algorithm or data structure to use in different scenarios.
- Be familiar with writing recursive methods.

# **OUTCOMES:**

The student should be able to:

- Describe standard algorithms such as sorting algorithms, search algorithms, string matching algorithms, and graph traversal algorithms;
- Apply these algorithms or a given pseudo code algorithm in order to solve a given problem;
- Carry out simple asymptotic analyses of algorithms involving sequence, selection, and iteration, and identify and compare simple properties of these algorithms;
- Describe the algorithm design principles of divide-and-conquer, greedy method, and dynamic programming and distinguish the differences between these principles;
- ✤ Apply the studied algorithms that illustrate these design principles;
- Apply the studied design principles to produce algorithmic solutions to a given problem;
- Explain and illustrate the distinction between different classes of problems, in particular, polynomial time and exponential time solvable problems.

# UNIT I

**ALGORITHM ANALYSIS:** Efficiency of algorithms, Apriori Analysis, Asymptotic Notations, Time complexity of an algorithm using O notation, Polynomial Vs Exponential Algorithms, Average, Best, and Worst Case Complexities, Analyzing Recursive Programs. Introduction to Computability, correctness and complexity.

# UNIT-II

**TREES:** Trees, Binary Trees, Representing binary trees in memory, traversing binary trees, traversal algorithms using stacks, Binary search trees, search, insert, delete operations in BST, Balanced search trees: AVL trees, B+ trees and 2-3 trees **Graphs**: Representation of graphs: Adjacency matrix and Path matrix, Depth First Search, Breadth First Search

# UNIT-III

**Divide – and – Conquer & Greedy Method:** Divide-and-conquer method: General Method, Binary Search, Finding Maximum and Minimum, Quick Sort, Merge sort, Strassen's Matrix Multiplication, Greedy Method: General Method, Minimum Cost Spanning Trees, Single Source Shortest Path, Job Sequencing with deadlines.

# UNIT IV

**DYNAMIC PROGRAMMING:** General Method, Multi Stage Graphs,All Pairs Shortest Path, Single Source Shortest Path, 0 / 1 Knapsack problem, Reliability Design, Traveling Sales Person's Problem.

## UNIT V

**BACK TRACKING:** General Method, 8 – Queen's Problem, Graph Coloring, Sum of Subsets problem, Graph coloring, Hamiltonian cycles. Knapsack problem.

# UNIT VI

**Branch – and – Bound:** Branch – and – Bound: The Method, LC Search, 0 / 1 Knapsack Problem – LC Branch and bound solution, FIFO Branch and Bound solution ,Traveling sales Person's Problem, introduction to NP-Hard and NP-Complete problems

## **TEXT BOOKS:**

- 1. Fundamentals of Computer algorithms, Ellis Horowitz, Sartaj Sahni, and Sanguhevar Rajasekharan, Second Edition, Galgotia Publications.
- 2. Data structures and algorithms, G A V Pai, The McGraw Hill edition.
- 3. Data Structures using C, Samir Kumar Bandyopadhyay & Kasinath Dey, Person Education. 2004

## **REFERENCE BOOKS:**

- 1. Theory and problems of data structures by Seymour Lipschutz, Third Edition, Tata McGraw-Hill Publishing
- 2. Data Structures using C, Padma Reddy AM, Sri Nandi Pub. 1999.
- 3. Classic Data Structures, Debasis Samanta, PHI Learning Pvt Ltd, 2nd edition.

## Autonomous INFORMATION TECHNOLOGY

II B.Tech, I-Sem (IT)

T C 1+2\* 1

**RGM-R-2015** 

# (A0011154)COPORATE MANAGEMENT SKILLS (Skill Development Course-1\*)

## **OBJECTIVES:**

- ✤ To improve the communication skills of the students.
- To raise the confidence of the students with respect to the inter-personal communication.
- ✤ To make them to habituate to the Team culture and Team Work.
- To ensure the students to take up the challenges of Group Discussion and Personal Interview.
- ✤ To improve the overall personality of the students.

## **OUTCOMES:**

- ✤ Able to improve the communication skills.
- ✤ Able to obtain the confidence of students with respect to the inter-personal communication.
- ✤ Able to cultivate the Team culture and Team Work.
- ✤ Able to take the challenges of Group Discussion and Personal Interview.

## UNIT-1

**Concept of Communication**: Significance-Functions of Communication-Process-Different types of Communication-Essentials of good communication-Channels of communication-Formal and informal communication networks.

## UNIT-2

**Types of Communication:** Oral Communication-Tips to make oral communication effective-Merits and Demerits of oral communication-Written Communication-Steps in Writing-Merits and Demerits of written communication-Non verbal communication and Different types in it.

## UNIT-3

**Barriers to Communication:** Types of barriers-Technological, Sociopsychological-How to overcome the barriers-Different communication styles and models.

## UNIT-4

**Interviews:** Resume preparation, Interview Process-Types-Common mistakes in interview-Preparation for interviewee.

## UNIT-5

**Emotional Intelligence:** Felt Vs Displayed emotions-Emotional dimensions- External constraints on emotion-Gender and emotion-Importance of emotional intelligence.

## UNIT-6

**Personality and Perception:** Determinants of personality-Theories of personality-Components of perception-Factors influencing the perception process-Johari Window.

## **REFERENCE BOOKS:**

- 1. Business communication Meenakshi Raman oxford university prof
- 2. Business communication Lalitha Ramakrishna
- 3. Business communication Hudson,5 /E,Jaico publication
- 4. Effective communication Harward Business school, Harward Business review no 1214

II B.Tech, I-Sem (IT)

P C 3 2

# (A1293153) FUNDAMENTALS OF OBJECT ORIENTED DESIGN LAB

## **OBJECTIVES:**

- ✤ To familiarize students with Rational Rose and how to work with it
- To train them to draw different UML diagrams using Rational Rose.
- ✤ To train students to design and develop projects using UML.

## **OUTCOMES:**

- Understand key concepts and modelling techniques in object-oriented analysis and design
- Demonstrate understanding of the concepts and techniques by applying objectoriented modelling techniques in analysis and design of an object-oriented system
- Critically evaluate modelling techniques in object-oriented analysis and design
- Demonstrate ability to work as a member of a software development project team

## Week #

## Tasks

- Week 1 Introduction to UML and Familiarizing with Rational Rose
- Week 2 Introduction to use case diagrams
- Week 3 Class Diagram
- Week 4 Interaction diagrams: sequence and collaboration diagrams
- Week 5 Flow of events and activity diagram
- Week 6 State Transition Diagram, Component and deployment diagrams
- Week 7 Project-1
- Week 8 Project-1 continue.....
- Week 9 Project-2
- Week 10 Project-2 continue.....
- Week 11 Project-3
- Week 12 Project-3 Continue....
- Week 13 Project-4
- Week 14 Project viva & evaluation First Internal exam

Project-1	Project-2
1) Library Management System	1) Virtual Classrooms
2) Online Help Desk	2) Construction of House
3) E-Post Office	3) E-Ticketing System
4) Patient Billing Software	4) Online Education System
5) Retail Shop	5) Credit Card System
Project-3	Project-4
1) Railway Reservation System	1) Hospital Management System
2) E-Municipality	2) Online Counselling System
3) Online Application	3) Online Attendance System
4) Two-Party Phone Call	4) E-Voting System
5) ATM	5) Elevator Operations

## **TEXT BOOKS:**

- 1. Practical Object-Oriented Design with UML, Mark Priestley, Tata McGraw Hill
- 2. Appling UML and Patterns: An introduction to Object Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education
- 3. The Unified Modeling Language User Guide, Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education

# Autonomous INFORMATION TECHNOLOGY

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# (A0472153) DIGITAL LOGIC DESIGN LAB (Common to CSE & IT)

## **OBJECTIVES:**

- Know the fundamentals of Boolean algebra and theorems, Karnaugh maps including the minimization of logic functions to SOP or POS form.
- To strengthen the principles of logic design and use of simple memory devices, flipflops, and sequential circuits.
- To fortify the documentation standards for logic designs, standard sequential devices, including counters and registers, combinational devices, includes decoder, multiplexer.

## **OUTCOMES:**

- Ability to perform the three basic logic operations and construct the truth tables for the different types of gates. And Implement logic circuits using basic AND, OR and NOT gates.
- Ability to Use De-Morgan's theorem to simplify logic expressions and describe the concept of active LOW and active HIGH logic signals and Use Boolean algebra and K-map as tool to simplify and design logic circuits and Design simple logic circuits without the help of truth tables.
- Ability to Construct and analyse the operation of flip-flop and troubleshoot various types of flip-flop circuits, decoder, multiplexer.
- 1. Basic Logic Gates AND, OR, NOT and their applications
- 2. Universal gates NAND and NOR
- 3. Study of combinational circuits 1 Half Adder and Full Adder
- 4. Study of combinational circuits 1 Half Sub tractor and Full sub tractor.
- 5. Study of Flipflopsa) S-R F/F b) J-K F/F c) D-F/F d)T F/F
- 6. Design of four bit ring counter using Flip Flop
- 7. 3 bit synchronous counter using Flip Flop
- 8. 4-bit Johnson Ring counter using Flip Flop
- 9. MOD-5 Synchronous counters using F/F
- 10. 2-4 decoder
- 11. 4 to 1 Multiplexer
- 12. 3 bit up/down counter using F/F

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# (A1294153) ALGORITHMS AND DATA STRUCTURES LAB USING C

## The Following Programs are to be implemented in C programming language.

## **OBJECTIVES:**

To implement some simple programming exercise on data structures taught in algorithms & data structures course using C programming language

## **OUTCOMES:**

- Understand and develop a variety of techniques for designing
- Design a variety of data structures and algorithms and should be able to use them appropriately to solve problems
- Understand some fundamental algorithms used in scientific computing and solve computational problems using these algorithms
- Develop new or re-use already existing efficient algorithms to solve problems

## LAB EXPERIMENTS:

- 1) Write a program to Implement Binary search technique using recursion.
- 2) Write a program to Implement Tree traversal algorithms using recursion.
- 3) Write a program to print all the nodes reachable from a given starting node in a digraph using BFS method
- 4) Write a program to print all the nodes reachable from a given starting node in a digraph using DFS method
- 5) Write a program to implement merge sort technique using Divide and conquer approach.
- 6) Write a program to implement quick sort technique using Divide and conquer approach.
- 7) Write a program to implement prims algorithm to find MST
- 8) Write a program to implement kruskkals algorithm to find MST
- 9) Write a program to implement stresses matrix multiplication technique.
- 10) Write a program to implement Bellman ford algorithm finding shortest path from single source to all vertices.
- 11) Write a program to implement All pairs shortest path using Floyd's algorithm.
- 12) Write a program to implement N queen's problem using back tracking.
- 13) Write a program to implement 0/1 knapsack problem using dynamic programming.

## TEXT BOOKS:

- Data Structures Using C, Padma Reddy AM, Sri Nandi Pub. 1999.
- Data Structures using C, Samir Kumar Bandyopadhyay & KasinathDey, Person Edu. 2004.
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**RGM-R-2015** 

## (A0012156) PROBABILITY AND STATISTICS (Common to CE, ME, CSE & IT)

#### **OBJECTIVES:**

To help the students in getting a thorough understanding of the fundamentals of probability and usage of statistical techniques like testing of hypothesis, statistical quality control and queuing theory.

#### **OUTCOMES:**

By the end of module students will be expected to demonstrate proper understanding of the concepts of Probability and Statistics and use these to solve the problems in Industry.

#### UNIT - I

Basic concept of probability-Random variables-Expectation-Discrete and continuous distributions.

#### UNIT – II

Distribution functions. Binomial, poison and normal Distributions-Related properties.

#### UNIT – III

Test of Hypothesis: population and sample – Confidence interval of mean from normal distribution – Statistical Hypothesis – Null and Alternative hypothesis- level of significance. Test of significance – Test based on normal distribution –Z test for means and proportions.

#### UNIT-IV

Small samples – t- test for one sample and two sample problem and paired t- test, F- test and chi-square test (Testing of goodness of fit and independence).

#### UNIT – V

Statistical quality control: Concept of quality of a manufactured product –Defects and Defectives – causes of variations – Random and assignable – The principle of Shewhart control chart-Charts for attribute and variable quality characteristics-Constructions and operation of  $\bar{X}$ -Chart,R-Chart, P-chart and C-chart.

#### $\mathbf{UNIT} - \mathbf{VI}$

Queuing theory: Pure birth and Death process, M/M/1 and M/M/S and their related simple problems.

#### **TEXT BOOKS:**

- 1. Probability and statistics for Engineers by Miller and Freunds, Pearson education.
- 2. Probability and statistics for Engineers by Dr.J.Ravichandran, wiley-India publishers.

#### **REFERENCES:**

- 1. Higher Engineering Mathematics by B.S.Grewal, Khanna Publishers.
- 2. Statistical methods by S.P.Gupta, S.Chand Publications.
- 3. Probability and statistics for science and engineering by G.Shankerrao, universities press.
- 4. Engineering Mathematics BySrimantha Pal et.al. Oxford University Press.

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## (A1206154) COMPUTER ORGANIZATION AND DESIGN

#### **OBJECTIVES:**

- ✤ To teach students the basics of modern computer architectures.
- To emphasize on understanding the interaction between computer hardware and software at various levels.
- To cover the concepts of Computer technology, Performance Evaluation, Instruction set design, Computer arithmetic, Data path and Control unit design of processors and Enhancing performance with pipelining.

#### **OUTCOMES:**

The student should be able to

- \* Know basic Instruction Set Architecture (ARM) of a model CPU.
- Demonstrate understanding of low level computing can affect high level computing, e.g. cache design and data locality.
- Demonstrate knowledge of the memory hierarchy in a computer system.
- Demonstrate knowledge of performance factors associated with computer system organization, such as bus widths, clock rate, cache size, memory speed, CPU speed, etc.
- Demonstrate the design of a processor and the pipeline architecture in terms of data paths.

#### UNIT I

Introduction: Computers: History of computers and their classification

Basics of modern computer systems: View of a computer as an integrated system, Neumann machine, and block diagram of a computer system.

Information: Definition, Characteristics and interpretation, Data and its logical and physical concepts, binary form of program and instruction.

Number Systems: Binary, Decimal, Octal, Hexadecimal and their inter-conversions.

#### UNIT II

Computer Arithmetic: Binary addition and subtraction using signed-Magnitude, 1's complement and 2's complement, Binary multiplication and division, Floating point representation and arithmetic, arithmetic through stacks.

Codes for character representation: hexadecimal, BCD, Excess-3, Gray code, ASCII, EBCDIC, Unicode.

Digital Circuits: Half Adder, Full Adder, Binary adder-subtractor, binary incrementer, Multiplexers, Encoder and decoder

#### UNIT III

Memory: Primary Memory – RAM, SRAM, DRAM, ROM, EPROM. Secondary Memory – Magnetic Floppy and Hard Disk. Optical Memory – CDROM, WORM. Concept of Virtual Memory Concept of Cache and their need. Memory hierarchy.

#### UNIT IV

Input/output devices: Input/output devices, input/output interface, asynchronous data transfer, modes of data transfer. I/O modules, Concepts of programmed I/O, interrupt Drive I/O, DMA, I/O processors

## UNIT V

CPU: Functions of CPU, register classification and organization, instruction sets and examples of instruction set, addressing schemes, instruction formats, instruction cycle and instruction pipelining.

## UNIT VI

Operating System Support: Basic Concepts, Batch, Multiprogramming and Time-Sharing, Introduction to multiprocessors: Characteristics of Multiprocessors, Time-Shared Bus, Multi-port memory.

#### TEXT BOOK:

1. Computer System architecture: M. Morris Mano, PHI,

#### **REFERENCE:**

1. Computer organization and architecture: William Stallings, PHI, Sixth edition

## Autonomous INFORMATION TECHNOLOGY

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## (A0009153) ENVIRONMENTAL SCIENCE

#### **OBJECTIVES:**

- Creating the awareness about environmental problems among people.
- Imparting basic knowledge about the environment and its allied problems.
- Developing an attitude of concern for the environment.
- Motivating public to participate in environment protection and environment improvement.
- ✤ Acquiring skills to help the concerned individuals in identifying and solving environmental problems.
- Striving to attain harmony with Nature.
- Environmental education should be compulsory, right from the primary up to the post graduate stage.
- Environmental education should have an interdisciplinary approach by including physical, chemical, biological as well as socio-cultural aspects of the environment. It should build a bridge between biology and technology.
- Environmental education should take into account the historical perspective, the current and the potential historical issues.
- Environmental education should emphasise the importance of sustainable development i.e., economic development without degrading the environment.
- Environmental education should emphasise the necessity of seeking international cooperation in environmental planning.
- Environmental education should lay more stress on practical activities and first hand experiences.

#### **OUTCOMES:**

- Understand environmental problems arising due to developmental activities.
- Realize the importance of ecosystem and biodiversity for maintaining ecological balance.
- Identify the natural resources and suitable methods for conservation and sustainable development.
- ✤ Identify the environmental pollutants and abatement devices.

#### UNIT I

**MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL SCIENCE:** Environment - Definition, scope and importance, Segments of Environment-Importance, Productivity, Aesthetical& Optional values of nature, need for public awareness.

#### UNIT II

**RESOURCES AND UTILIZATION:** Renewable and non-renewable resources.

- a) Natural Resources: soil & water sources(salinity intrusion conflicts of over utilization of water Resources-water logging, Hydro power project-problems), forest & mineral resources – Utilization-problems.
- b) Nonconventional resources of energy(Solar Energy, wind energy and their applications)
- c) Chemical fertilizers and pesticides-problems.
- d) Green Revolution-white revolution- blue Revolution.
- e) Non equitable distribution of Resources.

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#### UNIT III

#### a) CONCEPTS OF ECO-SYSTEM

Structure and functions of an ecosystem: producers, consumers and decomposers-Interaction between biotic and abiotic factors in an ecosystem- Energy flow and its importance- Trophic levels- food chain- Food web –Ecological Pyramid, Ecological succession

#### b) TYPES OF ECOSYSTEM

Understanding the types of ecosystem : (i) terrestrial (forest, grassland and desert) and (ii) aquatic (fresh water and salt water) with an example of each.

#### UNIT IV

**BIODIVERSITY:** Introduction – Definition - genetic, species and ecosystem diversity -Biogeographical classification of India - Value of biodiversity- Hot-sports of biodiversity -Biodiversity at global, National and local levels - India as a mega diversity nation - Hotspots of biodiversity - Threats to biodiversity - IUCN Red data book.

Conservation of bio diversity (IN-SITU and EX-SITU conservation)

#### UNIT V

#### **ENVIRONMENTAL POLLUTION:**

Introduction - Cause, effects and control measures of

- a. Air pollution
- b. Water pollution
- c. Soil pollution
- d. Marine pollution
- e. Noise pollution
- f. Thermal pollution
- g. Nuclear hazards

Muncipal Solid waste Management: Sources and Disposable methods.

Diaster management: floods, earthquake, cyclone.

#### UNIT VI

#### HUMAN POPULATION:

- a) Population and Environment:- Definition of species, community, population; Population growth rate curves, Sex ratio, From unsustainable to sustainable development, Diseases-HIV, Malaria, Diaharia, Cancer.
- b) Human rights, fundamental duties and value education.
- c) Women and child welfare & Family welfare programs.

#### SOCIAL ISSUES:

- a) Resettlement and rehabilitation of people.
- b) Energy Crisis urban and rural sectors.
- c) Greenhouse effect and global warming.
- d) Climatic changes.
- e) Acid rain.
- f) Ozone layer depletion.
- g) Sustainability- water conservation methods- Rain water harvesting.

#### **TEXT BOOKS:**

- 1. Deswal, S and Deswal A., (2004), A Basic Course in Environmental Studies, Dhanpat Rai & Co. Delhi.
- 2. Anubha Kousik and C P Kousik ., New age international publishers.

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- 3. Garg, S.K and Garg, R., (2006), Ecological and Environmental Studies, Khanna Publishers, Delhi.
- 4. Chauhan, A.S., (2006), Environmental Studies, Jain Brothers, New Delhi

## **REFERENCES**:

- a) Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- b) Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd.,
- c) Ahmedabad -380 013, India, Email:mapin@icenet.net (R)
- d) Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
- e) Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)
- f) Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental
- g) Encyclopedia, Jaico Publ. House, Mumabai, 1196p
- h) De A.K., Environmental Chemistry, Wiley Eastern Ltd.

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## (A1207154) RELATIONAL DATABASE DESIGN AND DEVELOPMENT

#### **OBJECTIVES:**

To teach students ability to

- Design and develop a relational database system with appropriate functionality to process the data and with constraints to maintain data integrity and avoid data redundancy.
- Examine a typical business application where there are data processing problems and develop database solutions.
- Develop skills in the application of data modeling methods and query language.

#### **OUTCOMES:**

The student should be able to:

- Understand and apply methods in requirements analysis, design, and implementation of relational database systems.
- Understand and differentiate between Entity-Relational, Object-Relational, Object-Oriented database systems.
- Use SQL for data aggregation, calculations, views, sub-queries, embedded queries, manipulation, and report generation. Also, demonstrate the use of SQL for database creation and instantiation.
- Recognize normal form violations given a set of relations and a set of functional dependencies
- Understand how putting relations in normal forms reduces redundancy and update/delete anomalies.

#### UNIT I

**INTRODUCTION TO DATABASE SYSTEMS (DBS):** What are Data base Systems(DBS) and Database Management Systems (DBMS); DBS Applications, purpose, advantages; DBS VS file System; View of Data; DB languages; Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model; overview of DB design, storage and querying, Transaction management; DB architecture, DB users and administers;. {Chap-1}

#### UNIT II:

#### SQL

**Basic SQL:** Background, data definition, basic structure of SQL queries, set operations, aggregate functions, nested queries, complex queries, views, database modifications, join expressions.

**Advanced SQL:** Transactions, Integrity Constrains, SQL data types; authorization, Accessing SQL from a programming Language, functions and procedures.{Chaps 3.1 – 5.3}

#### UNIT III

**FORMAL RELATIONAL QUERY LANGUAGES:** Relational algebra operations, null values, Modifications of database.

Other Query Languages: Tuple relational Calculus – Domain relational calculus – QBE.

#### UNITIV

**DATABASE DESIGN & ER MODEL:** Overview of design process, ER model, constraints, ER diagrams, ER design issues; weak entities; Extended ER (EER) features, reduction to relation schemas, Conceptual Object Modelling using UML class diagrams,

## UNIT V

**RELATIONAL DATABASE DESIGN:** Features of good relational design, Problems Caused by redundancy; Problem related to decomposition; reasoning about FDs, FIRST, SECOND, THIRD Normal forms, BCN; lossless join decomposition, dependency preserving; overview of other types of dependencies and normal forms (No theory)

#### UNIT VI

**APPLICATION DEVELOPMENT:** Database application development: JDBC, SQLJ, stored procedures; internet concepts, internet tools, web interfaces to data, web fundaments, servlets and JSP; HTML and XML documents, 3-tier application architecture, the presentation layer, the middle tier, Internet bookshop as case study, { here we provide only an overview. The detailed programming aspects are discussed in Web Tech course.}

#### **TEXT BOOKS:**

- 1. Data base System Concepts, Silberschatz, Korth, 6<sup>th</sup> Edition, Tata McGraw hill,2010.
- 2. Data base Management Systems, Raghuramakrishnan, Johannes Gehrke, 3<sup>rd</sup> Edition, TATA McGrawHill.2007.

#### **REFERENCE BOOKS:**

- 1. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
- 2. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
- 3. Introduction to Database Systems, C.J.Date Pearson Education.

II B.Tech, II-Sem (IT)

## (A1208154)UNIX AND SHELL PROGRAMMING

#### **OBJECTIVES:**

- Need to learn different types of shells in UNIX operating system.
- Need to learn shell programming and C shell programming and communications in UNIX.

#### **OUTCOMES:**

Students will learn different shell programming environments and basic communication commands in UNIX.

#### UNIT – I

Introduction to shells: UNIX session, standard streams, redirection, pipes, tee command, command execution, command-line editing, quotes, command substitution, job control, aliases, variables, predefined variables, options, shell/environment customization.

#### UNIT – II

Filters: filters and pipes, concatenating files, displaying beginning and end of files, cut and paste, sorting, translating characters, files with duplicate lines, count characters, words or lines, compare files.

Communications: User communications, electronic mail, remote access, file transfer.

Regular Expressions: atoms, operators, grep, operation, grep family, examples, searching for file content.

#### UNIT – III

sed: scripts, operation, addresses, commands, applications, grep and sed

awk: execution, fields and records, scripts, operation, patterns, actions, associative arrays, string functions, mathematical functions, user-defined functions, using system commands in awk, applications, awk and grep, sed and awk.

#### $\mathbf{UNIT} - \mathbf{IV}$

Interactive Korn shell: Korn shell features, two special files, variables, output, input, exit status of a command, environment variables, options, startup scripts, command history, command execution process.

#### $\mathbf{UNIT} - \mathbf{V}$

Interactive C shell: C shell features, two special files, variables, output, input, exit status of a command, eval command, environment variables, on-off variables, startup and shutdown scripts, command history, command execution scripts.

#### UNIT – VI

Korn shell programming and C shell programming: Basic script concepts, Expressions, Decisions making selections, repetition, special parameters, changing positional parameters, argument validation, debugging scripts, script examples.

#### **TEXT BOOK:**

1. "UNIX and shell programming", Behrouz A. Forouzan, Richard F. Gilberg, Brooks/Cole, CENGAGE Learning.

#### **REFERENCE BOOK:**

- 1. "UNIX Shell Programming", Yashwant Kanetkar.
- 2. Your UNIX-The Ultimate Guide, Sumitabha Das, Tata McGraw Hill

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# Autonomous INFORMATION TECHNOLOGY

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## (A1209154) JAVA PROGRAMMING

#### **OBJECTIVES:**

The objective of this course is to teach the students about core java language:

- The major objective of this course is to provide theoretical knowledge about the basic programming language concepts.
- ✤ To familiarize the students with the object oriented concepts
- Discuss java's exception-handling mechanism, multithreading programming, string handling and applets.
- Discuss java development environment.

#### **OUTCOMES:**

The Student should be able to:

- An understanding of the principles and practice of object oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements;
- ✤ A competence to design, write, compile, test and execute straightforward programs using a high level language;
- ✤ An appreciate of the principles of object oriented programming;
- An awareness of the need for a professional approach to design and the importance of good documentation to the finished programs.

#### UNIT 1

#### **INTRODUCTION:**

**Introduction to Java:** History of Java, Java Virtual Machine, Java Features. Getting Started with Java: Java Architecture, Compiling and Running an Application, Java Development Kit, Java language Basics like Keywords, Comments, Data Types, Variable, Identifiers, Operators, Control Flow Statements, Stings, Arrays, I/O.

#### UNIT 2

**CLASSES AND OBJECTS:** Class Fundamentals, Declaring Objects, Assigning Object Reference Variables, Introducing Methods, Constructors, this Keyword, Garbage Collection, finalize Method, Overloading Methods, Using Objects as Parameters, Argument Passing, Recursion, Access Controls, static and final key words, Inner classes, Command-Line Arguments.

#### UNIT 3

INHERITANCEANDSTRINGHANDLING:Inheritance:InheritanceBasics, Super keyword, Method Overriding, Dynamic MethodDispatch, Abstract classes and Methods, Using final with Inheritance, ObjectClass.

String Handling: Characters, String Operations, String Builder Classes, Wrapper Classes

#### UNIT 4

#### **GENERICS, INTERFACES AND PACKAGES:**

**Packages:** Package, Built-in and User Defined Packages, Creating Package, Access Protection, Importing Packages.

**Interfaces:** Defining and Implementing Interfaces, Nested Interfaces, Variables in Interfaces, Extending the Interfaces.

Generics: Generic Classes, Generic Interfaces, Generic Constructors and Methods.

UNT 5

## EXCEPTIONS, BASIC I/O, MULTI THREADING:

**Exceptions:** Exception-Handling Fundamentals, Exception Types, Built-in Exceptions, Nested try Statements, Multiple catch Clauses, throw and throws keywords.

**Basic I/O:** I/O Streams, File I/O.

**Multithreading:** Thread Model, Life Cycle of a Thread, Creating Thread, Creating Multiple threads, Thread Priorities, Synchronization, Interthread Communication.

## UNIT 6:

**Applets:** Definition of an Applet Subclass, Life Cycle of an Applet, Applet's Execution Environment, Developing and Deploying an Applet.

## Network programming:

Networking Basics, Networking Classes and Interfaces, Inet Address, TCP/IP Client Sockets, URL, URL Connection, Http URL Connection, The URI Class, Cookies, TCP/IP Server Sockets, Datagram, RMI programming.

#### TEXT BOOKS:

- 1. The complete Reference, Java J2SE, 7thedn, TMH 2005.
- 2. Core Java 2 volume 1-Fundamentals. By Cay S. Horstmann, and Gary Cornell. 2011, Pearson Education.
- 3. http://www.oracle.com/technetwork/java/javase/overview/index.html

## **REFERENCE BOOKS:**

- 1. Head First Java, Kathy Sierra & Bert Bates, (O'Reilly) Shroff Publishers & Distributors Pvt. Ltd,
- 2. How to Program, Deitel & Deitel, Pearson Education,6
- 3. Java for programmers, Paul J. Deitel, 2009, Pearson Education.
- 4. Programming with Java, T. V. Suresh Kumar, 2011, Pearson Education

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#### (A0010153) APTITUDE, ARITHMETIC, REASONING & COMPREHENSION (Skill Development Course-2\*) (Common to All Branches)

#### **OBJECTIVES:**

- ✤ To make the students ready to the recruitment drives.
- ✤ To raise the confidence of the students to face the written test of any Company.
- To train the students regarding employability skills.

#### **OUTCOMES:**

- Students become well trained for recruitment drives.
- Student becomes well trained to face the written test of any company.
- Students become well trained in employability skills

#### UNIT I

Numbers, Number Systems Simple Equations, Ratio, Proportion, Variation Quadratic Equations, Progressions Percentages.

#### UNIT II

Profit, Loss, Partnerships Averages, Mixtures & Allegations, Simple Interest, Compound Interest, Time and Work-Pipes, indices, surds, inequalities ,Cisterns Time and Distance Geometry and Menstruation.

#### UNIT III

Permutations & Combinations and Probability Data Interpretation & Data Sufficiency.

#### UNIT IV

Number & Letter Series, Analogies, Coding Decoding, Odd Man Out Blood Relations.

#### UNIT V

Direction Sense, Symbols and Notations Deductions & Connectives Clocks, Calendars Analytical

#### UNIT VI

Reasoning (Distribution+ Binary Logic + Puzzles) Cubes, Venn Diagrams Analytical Puzzles (Linear + Circular +Selections + Sequencing + Routes & Networks + Comparisons) and Non Verbal Reasoning

#### **REFERENCES:**

- 1. R.S.Agarwal " Quantitative Techniques" S.Chand Series
- 2. Shankuntala Devi "Techniques of Reasoning" S.Chand Series

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P C 3 2

## (A1295154)RELATIONAL DATABASE SYSTEMS LAB

#### **OBJECTIVES:**

• To teach the students database design and querying and PL/SQL

#### **OUTCOMES:**

The student will be able to

- Analyse situations for the application of RDBMS (relational database management system) solutions.
- Design a suitable relational data model for a given application area
- Examine the functions required and the organizational implications of administrating a RDBMS

#### **Recommended Systems/Software Requirements:**

- Intel based desktop PC
- ✤ MYSQL /Oracle latest version Recommended
- 1) Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables). Examples using SELECT command.
- 2) Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.
- 3) Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
- 4) Queries using Conversion functions (to\_char, to\_number and to\_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next\_day, add\_months, last\_day, months\_between, least, greatest, trunc, round, to\_char, to\_date)
- 5) i) Creation of simple PL/SQL program which includes declaration section, executable section and exception -Handling exceptions (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)

ii) Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

- 6) Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
- 7) Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE-APPLICATION ERROR.
- 8) Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.
- 9) Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
- 10) Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.
- 11) Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
- 12) Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

# Autonomous INFORMATION TECHNOLOGY

**Application Development**: Design and develop any ONE of the following application area. Clearly mention the scope of the system. Use standard tools for expressing the design of the systems.

- ✤ Library Information System
- Students' Information System
- Ticket Reservation System
- ✤ Hotel Management System
- Hospital Management System
- Inventory Control system
- Retail Shop Management
- Employee Information System
- ✤ Payroll System
- ✤ Time table development system
- ✤ Any other Similar System

## **Text Books:**

- 1) ORACLE PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson Edu. 3rd Edition
- 2) ORACLE DATA BASE LOG PL/SQL Programming by SCOTT URMAN, Tata Mc-Graw Hill.
- 3) SQL & PL/SQL for Oracle 10g, Black Book by Dr.P.S. Deshpande.
- 4) Mysql reference manual.

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## (A1296154)UNIX AND SHELL PROGRAMMING LAB

#### **OBJECTIVES:**

1. Students are expected to know most aspects of UNIX commands that are needed by a program developer or UNIX user, and some system administration. Although it is not required for this course, students are encouraged to install Linux on their personal computers.

#### **OUTCOMES:**

The student will be able to:

- 1. Discuss the development of UNIX system over time.
- 2. Use line and screen text editors with regular expressions.
- 3. Explain UNIX file system including advanced file processing.
- 4. Practice pipelining and IO redirecting.
- 5. Explain process concepts and cooperating processes.
- 6. Manage UNIX base networks.
- 7. Write simple shell scripts.

#### <u>Week 1</u>:

- 1. a) Login to the system
  - b) Use the appropriate command to determine your login shell
  - c) Use the /etc/passwd file to verify the result of step b.

d) Use the who command and redirect the result to a file called myfile1. Use the more command to see the contents of myfile1.

e) Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2. Use the more command to check the contents of myfile2.

2. a) Write a sed command that deletes the first character in each line in a file.

b) Write a sed command that deletes the character before the last character in each line in a file.

c) Write a sed command that swaps the first and second words in each line in a file.

#### <u>Week 2</u>:

- a) Pipe your /etc/passwd file to awk, and print out the home directory of each user.
- b) Develop an interactive grep script that asks for a word and a file name and then tells how many lines contain that word.
- c) Repeat
- d) Part using awk

#### <u>Week 3</u>:

- a) Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.
- b) Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.
- c) Write a shell script that determines the period for which a specified user is working on the system.

#### <u>Week 4</u>:

a) Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers.

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b) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

### <u>Week 5</u>:

- a) Write a shell script that computes the gross salary of a employee according to the following rules:
  - i) If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic.
  - ii) If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic The basic salary is entered interactively through the key board.
- b) Write a shell script that accepts two integers as its arguments and computers the value of first number raised to the power of the second number.
- c) Write a shell program to generate multiplication table

#### <u>Week 6</u>:

- a) Write an interactive file-handling shell program. Let it offer the user the choice of copying, removing, renaming, or linking files. Once the user has made a choice, have the program ask the user for the necessary information, such as the file name, new name and so on.
- b) Write shell script that takes a login name as command line argument and reports when that person logs in , if he is logged in find out on which terminal he is working.
- c) Write a shell script which receives two file names as arguments. It should check whether the two file contents are same or not. If they are same then second file should be deleted.

## <u>Week 7</u>:

#### Session 1

- a) Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
- b) Develop an interactive shell script that asks for a word and a file name and then tells how many times that word occurred in the file.
- c) Write a shell script to perform the following string operations:
  - i. To extract a sub-string from a given string.
- ii. To find the length of a given string.
- d) Write a shell script to find the files which have read, write and execute permissions in the current directory.

## Session 2:

- a) Write a shell program to perform the following operations insertion , deletion , searching and sorting on arrays.
- b) Write a shell program to reverse the rows and columns of a matrix.

#### <u>Week 8</u>:

Write a C program that takes one or more file or directory names as command line input and reports the following information on the file:

- i. File type
- ii. Number of links
- iii. Time of last access (Note: Use stat/fstat system calls)

#### <u>Week 9</u>:

Write C programs that simulate the following unix commands:**mv, cp, ls**, (Use system calls)

## Week 10:

- (a) Write a C program to emulate the Unix ls –l command.
- (b) Write a C program that demonstrates redirection of standard output to a file.Ex: ls > f1.
- (c) Write a C program to create a child process and allow the parent to display "parent" and the child to display "child" on the screen.

#### **TEXT BOOKS:**

- 1) Introduction to UNIX & SHELL programming, M.G. Venkatesh Murthy, Pearson Education.
- 2) Unix concepts and applications, Sumitabha Das, 4th Edition, TMH.
- 3) Unix for programmers and users, Gaham Glass & K. Ables, 3rd edition, Pearson education.
- 4) Unix and shell Programming -A text book, B.A. Forouzan & R.F. Giberg, Thomson.
- 5) Beginning shell scripting, E. Foster Johnson & other, Wiley, India.

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## (A1297154)JAVA PROGRAMMING LAB

#### **OBJECTIVES:**

The objective of this course is to teach the students about the core java programming environment.

- The major objective of this course is to provide practical knowledge about the basic programming language concepts.
- ✤ To provide practical knowledge of object oriented concepts.
- To provide practical knowledge about java's exception-handling mechanism, multithreading programming, string handling and applets.
- Practice on java development environment.

#### **OUTCOMES:**

The student will be able to:

- Be able to implement, compile, test and run Java programs, comprising more than one class, to address a particular software problem.
- Understand how to include arithmetic operators and constants in a Java program.
- Be able to make use of members of classes found in the Java API (such as the Math class).
- Demonstrate the ability to employ various types of selection constructs in a Java program.
- Be able to employ a hierarchy of Java classes to provide a solution to a given set of requirements.
- Demonstrate the ability to employ repetition constructs in a Java program.
- Demonstrate the ability to use simple data structures like arrays in a Java program.

#### List of Experiments:

- 1. Write a Java program that prints all real solutions to the quadratic equation ax2+bx+c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions.
- 2. The Fibonacci sequence is defined by the following rule. The first 2 values in the sequence are 1, 1. Every subsequent value is the sum of the 2 values preceding it. Write a Java program that uses both recursive and non-recursive functions to print the n th value of the Fibonacci sequence.
- 3. Write a Java program that prompts the user for an integer and then prints out all the prime numbers up to that Integer.
- 4. Write a Java program to multiply two given matrices.
- 5. Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
- 6. Write a Java program for sorting a given list of names in ascending order.
- 7. Write a Java program to calculate the area of rectangle using parameterized constructor.
- 8. Program that illustrates how this keyword can be used by one constructor to explicitly invoke another constructor in the same class
- 9. Write a Java program for the method overloading.
- 10. Write a java program to implement Inheritance concepts.
- 11. Write a Java program for method overriding.
- 12. Write a java program to create an abstract class named shape that contains an empty method named number of sides (). Provide three classes named trapezoid,

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triangle and Hexagon such that each one of the classes extends the class shape. Each one of the class contains only the method number of sides () that shows the number of sides in the given geometrical figures.

- 13. Write a Java program that reads a line of integers and then displays each integer and the sum of all integers. (use String Tokenizer class)
- 14. Write a java program to implement package concepts.
- 15. Write a java program to implement Exception handling concepts.
- 16. Write a Java program that reads on file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
- 17. Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
- 18. Write a Java program that displays the number of characters, lines and words in a text file.
- 19. Write a Java program that creates three threads. First thread displays "Goof Morning" every one second the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every three seconds.
- 20. Write a Java program that correctly implements Producer-Consumer problem using the concept of Inter Thread Communication.
- 21. Write an Applet that displays a simple message.
- 22. Develop an applet that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named "compute" is clicked.
- 23. Write a java program to implement the APPLET PACKAGES, draw event handlers programs.
- 24. Write a java program to implement the APPLET PACKAGES, draw Lines, Rectangles, Rounded Rectangles, filled Polygons programs.
- 25. Write a java program to demonstrate Datagram
- 26. Write a RMI program to check whether given number is Armstrong or not.

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## (A1210155) MODERN OPERATING SYSTEM

#### **OBJECTIVES:**

The objective is to introduce to the operating system and different types of operating system.

- Understand main components of OS and their working.
- ✤ To study the operations performed by Operating System as a resource manager.
- Implementation of different memory management techniques.
- Description of multiprocessor and distributed OS.
- ✤ To study different OS and compare their features

#### **OUTCOMES:**

The student should be able to:

- Describe the major functions of an operating system. Include hardware and software relationships.
- Describe the major components of an operating system. (kernel, processes, files and memory management, user interfaces, IO devices etc.).
- Describe OS process interactions. This includes scheduling, communications, etc.
- Describe OS memory management. Include paging, virtual memory, swapping etc.

#### UNIT I

**INTRODUCTION**: What is OS, OS types; OS- concepts, system calls, structure. (Except 1.2 & 1.4)

#### UNIT II

**PROCESSES AND THREADS;** Processes, threads, Inter process communication, classical IPC problems, scheduling.

PROCESSES IN LINUX: Process Management System Calls in Linux, Implementation of Processes and Threads in Linux, Scheduling in Linux.

## UNIT III

**DEADLOCK & RECOVERY:** Resources, introduction to dead-lock, dead –lock detection & recovery, dead-lock prevention, dead-lock avoidance Two Phase Locking, Non-Resource deadlocks, Recovery. (Except3.3)

#### UNIT IV

**MEMORY MANAGEMENT:** Basic memory management, swapping, virtual memory, page replacement algorithms, segmentation, segmentation with paging, Design issues for paging. Segmentation and Segmentation with paging (Galvin 8.6, 8.7 for segmentation and segmentation with paging), segmentation with paging in MULTICS.

MEMORY MANAGEMENT IN LINUX: Memory Management System Calls in Linux, Implementation of Memory Management in Linux.

#### UNIT V

**FILE SYSTEMS:** File Systems and I/O: Files, Directories, File system implementation. Examples. Principles I/O hardware & software, I/O software layers. (Chapter 6, 5.1, 5.2, 5.3)

**THE LINUX FILE SYSTEM**: File System Calls in Linux, Implementation of the Linux File System.

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**INPUT/OUTPUT IN LINUX**: Input/output System Calls in Linux, Implementation of Input/output in Linux.

#### UNIT VI

**MULTIMEDIA AND MULTIPLE PROCESSOR OPERATING SYSTEMS:** Introduction to Multimedia, Multimedia Files, Multimedia Process Scheduling, Multimedia File System Paradigms.

#### **MULTIPLE PROCESSOR SYSTEMS:**

**MULTIPLE PROCESSORS:** Multiprocessor Hardware, Multiprocessor Operating System Types, Multiprocessor Synchronization, Multiprocessor Synchronization, Multiprocessor Scheduling.

**DISTRIBUTED SYSTEMS**: Network Hardware, Network Services and Protocols, Document-Based Middleware, Document-Based Middleware, File System-Based Middleware, Object-Based Middleware, Coordination-Based Middleware.

#### **TEXT BOOKS:**

- 1. Modern Operating Systems, Andrew S. Tanenbaum, 3<sup>rd</sup> Edition, Pearson education,2007.
- 2. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne ,7th Edition, John Wiley,2006.

#### **REFERENCE BOOKS:**

- Operating Systems Internal and Design Principles, Stallings, 5<sup>th</sup> Edition, Pearson education/PHI,2005
- 2. Operating System A Design Approach-Crowley, TMH.

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## (A1211155) DATA COMMUNICATIONS AND NETWORKING -1

#### **OBJECTIVES:**

Students who have successfully completed this course will have able to do the following:

- Understands the fundamentals.
- Gain knowledge about various networks, transmission of data.
- Knowledge in transmission network technologies.
- Gain knowledge in signalling systems.
- ✤ Gain knowledge in Ethernet technology.

#### **OUTCOMES:**

After completing this course the student must demonstrate the knowledge and ability to:

- Independently understand basic computer network technology.
- Understand and explain Data Communications System and its components.
- Identify the different types of LAN protocols.

#### UNIT I:

Introduction: Components, Data representations, Data flow, Networks, The Internet, Protocols and Standards. Network Models: Layered Tasks, The OSI Model, Layers in the OSI Model. Addressing. (Chapters 1,2)

#### UNIT II:

Physical Layer: Data and Signals: Fundamentals, Analog and Digital Signals, Transmission Impairments, Data Rate Limits, Performance. Data Transmission: Digital - to - Digital conversion, Analog - to - Digital Conversion, Transmission Modes (Parallel, Serial). Analog Transmission: Digital - to - Analog conversion, Analog - to - Analog Conversion. (Chapters 3, 4, 5).

#### UNIT III:

Multiplexing: FDM, WDM, TDM, STDM. Transmission Media and Switching: Guided and Unguided Media.

Data Link Layer: Error Detection and Correction: Fundamentals Block Coding, Linear Block Codes, Cyclic Codes, Checksum. (Chapters 6, 7, 10)

#### UNIT IV:

Datalink Control: Framing, Flow and Error Control, Data Link Protocols, HDLC, PPP. Multiple Accesses: CSMA / CA, CSMA / CD, Controlled Access, Channelization. (Chapters 11, 12)

#### UNIT V:

Wired LANs-Ethernet: IEEE Standards, Standard Ethernet, Changes in the Ethernet, Fast Ethernet, Gigabit Ethernet Network Layer: TCP/IP Protocol Suite, Comparison of TCP/IP with OSI, ATM. Network Layer Addressing: IPv4 Addresses, IPv6 Addresses. (Chapter 13, 19)

#### UNIT VI:

Network Layer-Multicasting and Routing: ICMP, IGMP, Delivery, Forwarding, Unicast Routing Protocols, Multicast Routing Protocols(Chapters: 21,22)

#### **TEXT BOOKS:**

1. Behrouz A Forouzan, Data Communications and Networking, 4thEdition, Tata McGraw Hill, 2007.

#### **REFERENCE BOOK:**

1. A.Tanenbaum, Computer Networks, 4th Edition, Prentice Hall, 2003.

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## (A1212155) WEB APPLICATION THROUGH JAVA & PYTHON

#### **OBJECTIVES:**

The objective of this introductory web application development program is to help students quickly acquire the core skills needed to develop web applications.

#### **OUTCOMES:**

The student should be able to:

- Installing and configuring a web server
- Writing dynamic web pages, accessing data bases and using web services
- Applying security concepts to web servers
- Designing and implementing web applications

#### UNIT I

#### HTML – JAVA SCRIPT

HTML: Basic tags, List, Tables, images, forms, Frames; Cascading Style sheets.

**Java Script:** Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script.

#### UNIT II

**DATABASE ACCESS:** Components of JDBC, JDBC Architecture, working with JDBC Statement objects, Result set, result set metadata, accessing a Database from a JSP Page.

#### UNIT III

**WEB SERVERS AND SERVLETS:** Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax. servlet Package, Reading Servlet parameters, Reading Initialization parameters. The javax. servlet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking.

#### UNIT IV

**INTRODUCTION TO JSP:** The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat.

#### UNIT V

**JSP APPLICATION DEVELOPMENT:** Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data

#### UNIT VI

**INTRODUCTION TO PYTHON:** History of Python, Python-syntax, Data types and variables, Built-in-functions and Methods, Control Structures, Exception Handling, Integrated Web Applications in Python – Building Small, Efficient Python Web Systems, Web Application Framework.

#### **TEXT BOOKS:**

- 1. HTML,CSS,Java Script,Perl,Python & PHP(web standards) by Steven M.Schafer, WILEY India.
- 2. Java Server Pages Hans Bergsten, Second Edition, SPD O'Reilly, 2002.

#### **REFERENCE BOOKS:**

- 1. Internet and World Wide Web How to program by Dietel and Nieto PHI/Pearson Education Asia.
- 2. An Introduction to web Design and Programming –Wang-Thomson.
- 3. Programming world wide web-Sebesta, Pearson.
- 4. Java Server Pages, Pekowsky, Pearson.
- 5. Python Web Programming, Steve Holden and David Beazley, New Riders Publications.

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## (A1213155) DATABASE MANAGEMENT CONCEPTS

## **OBJECTIVES:**

It covers:

- $\boldsymbol{\diamondsuit}$  Advanced data modelling and database development methodology,
- The techniques exploited by relational database technologies relating in particular to query processing and transaction management, and
- Post relational database technologies including object oriented databases and web databases.

#### **OUTCOMES:**

The student should be able to:

- Demonstrate the technologies of relational databases and their development.
- Develop competence with SQL and in building web facing database systems.
- Get and understanding of application issues and current trends in database technologies.

#### UNIT I

**FILE STRUCTURE, INDEXING AND HASHING:** File Organization, Organization of Records in Files, Data-Dictionary Storage, Database Buffer. Indexing and Hashing: Ordered Indices, Tree Index Files 485, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Index Definition in SQL. [Chps 10.5-10.8; Chp 11 except 11.4 & 11.9]

#### UNIT II

**QUERY PROCESSING AND OPTIMIZATION: Query Processing**: Measures of Query Cost, cost estimation of Selection, Sorting and Join Operation. Evaluation of Expressions. [Chp 12.1-12.5.5.2 and 12.7]

**Query Optimization**: Overview, Transformation of Relational Expressions, Estimating Statistics of Expression Results, Choice of Evaluation Plans. [13.1-13.4]

#### UNIT III

**TRANSACTIONS MANAGEMENT:** Transaction Concept, A Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity, Transaction Isolation Levels, Implementation of Isolation Levels, Transactions as SQL Statements. [14.1-14.10]

Concurrency Control: Lock-Based Protocols, Deadlock Handling, Multiple Granularity, Timestamp-Based Protocols, Validation Based Protocols, Multiversion Schemes.[15.1 – 15.6] Recovery System: Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm [16.1 – 16.4]

#### UNIT IV

**SYSTEM ARCHITECTURE: Database-System Architectures**: Centralized and Client–Server Architectures, Server System Architectures, Parallel Systems, Distributed Systems. [17.1-17.4]

**Distributed Databases**: Homogeneous and Heterogeneous Databases, Distributed Data Storage, Distributed Transactions, Commit Protocols, Concurrency Control in Distributed Databases, Availability, Distributed Query Processing, Heterogeneous Distributed Databases, Cloud-Based Databases, Directory Systems. [19.1-19.10]

### UNIT V

**OBJECT-BASED DATABASES:** Overview, Complex Data Types, Structured Types and Inheritance in SQL, Table Inheritance, Array and Multiset Types in SQL, Object-Identity and Reference Types in SQL, Implementing O-R Features, Persistent Programming Languages, Object-Relational Mapping, Object-Oriented versus Object-Relational. [22.1 – 22.10]

#### UNIT VI

**ADVANCED TOPICS:** Performance Tuning, Performance Benchmarks, Other Issues in Application Development, Standardization Spatial and Temporal Data and Mobility: Time in Databases, Spatial and Geographic Data, Multimedia Databases Mobility and Personal Databases. [24.1-24.4; 25.1 – 25.5]

#### **TEXT BOOKS:**

 Database System Concepts, Abraham Silberschatz, Henry F. Korth, S. Sudarshan, 6<sup>th</sup>Edition, Mc Grawhill.

#### **REFERENCE BOOKS:**

- 1) Data base Management Systems, Raghuramakrishnan, Johannes Gehrke, 3<sup>rd</sup> Edition, TATA McGraw Hill
- 2) Fundamentals of Database Systems, Elmasri, Navathe Pearson Education.
- Data base Systems design, Implementation, and Management, 7<sup>th</sup> Edition, Peter Rob & Carlos Coronel.
- 4) Introduction to Database Systems, C.J.Date Pearson Education.

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## (A0510155) C# AND .NET FRAMEWORK (Common to CSE & IT)

#### **OBJECTIVES:**

• To cover the fundamental concepts of the C# language and the .NET framework.

#### **OUTCOMES:**

- The student will gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the Framework.
- ✤ The student will gain programming skills in C# both in basic and advanced levels.

• By building sample applications, the student will get experience and be ready for large-scale projects.

#### UNIT I

**INTRODUCTION TO C#:** Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

#### UNIT II

**OBJECT ORIENTED ASPECTS OF C#:** Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Errors and Exceptions.

#### UNIT III

**WINDOWS APPLICATIONS:** Drawbacks of Console Applications, Container Controls, Non Container Controls, Developing Windows Application from Notepad and Visual Studio, Events, Types of Events – Mouse, Focus, Drag, Key and Other Related Events, Building Windows Applications.

**ADO.NET:** Problems with File Handling, Data Source Communication, Drivers and Providers, Introduction of ADO.NET, ADO.NET Namespaces, ADO.NET Objects, Accessing Data with ADO.NET.

#### UNIT IV

**BUILDING ASP.NET WEB PAGES:** HTML form Development, Client side Scripting, Server side Scripting, Web applications and Web servers, HTTP, Advantages Using ASP.NET, ASP.NET Application, ASP.NET Namespaces, ASP.NET Web Page Structure, Creating Sample C# Web Applications, ASP.NET Web Page Execution Architecture, Debugging and Tracing of ASP.NET.

#### UNIT V

**ASP.NET WEB CONTROLS:** Web Form Structures, Introduction to Web Form controls, Server Side Controls, Web Server Controls, GET and POST, Page Submission, Web Page Creation Techniques, Redirection between Web Pages, Validation Controls.

#### UNIT VI

**WEB SERVICES:** Web Services, Web Service Architecture, WSDL, Building WSDL Web Service.

**CONFIGURING.NET ASSEMBLIES:** Private Assemblies, Shared Assemblies, and Versioning.

**MULTITHREADED PROGRAMMING:** Thread Class, Life Cycle of a Thread, Steps for Creating a Thread, Thread Synchronization.

#### TEXT BOOKS:

- 1. Pro C# 2010 and the .NET 4 Platform, Andrew Trolesen,
- 2. Programming in C#, E. Balagurusamy, Tata McGraw-Hill, 2004.

#### **REFERENCE BOOKS:**

- 1. Programming C#, J. Liberty, 2<sup>nd</sup> Edition., O'Reilly, 2002.
- 2. C# and the .NET Platform, Andrew Trolesen, 2<sup>nd</sup> Edition, Dreamtech Press
- Sams Teach Yourself the C# Language in 21 Days', Bradley L Jones, 1<sup>st</sup> edition, 2001.
- 4. Microsoft C# Programming for the Absolute Beginner, Andy Harris, PTR publications, 2002.
- 5. The Complete Reference: C#, Herbert Schildt, Tata McGraw-Hill, 2004.
- 6. Professional C#, Robinson et al, 2<sup>nd</sup> Edition., Wrox Press, 2002.
- 7. C# and the .NET Platform, Andrew Troelsen, A! Press, 2003.
- 8. A Textbook on C#, S. Thamarai Selvi, R. Murugesan, Pearson Education, 2003

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## (A0016155) ENGINEERING ECONOMICS AND ACCOUNTANCY (Common to CSE, IT & ME)

#### **OBJECTIVES**

- To understand the principles of and techniques of managerial economics.
- ✤ To understand the business organizations.
- ✤ To understand the financial accounting and analysis.
- To understand maintain a particular product at the lowest cost while meeting the specifications of the customer

#### **OUTCOMES:**

- Students will able to analyse the demand in the present market.
- Students will able to how to precise the production cost.
- Students will able to know the price output decisions are made in markets.
- Students will able to maintain the books by using the financial accounting

#### UNIT 1

**Introduction to managerial economics:** Definition, Nature and scope of managerial economics, Demand analysis, Demand determinants, law of demand and its exceptions.

#### UNIT II

**Elasticity of Demand:** Definition, types, measurement and significance of elasticity of Demand. Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiment, judgemental approach to demand forecasting)

#### UNIT III

**Break even analysis and pricing strategies:** Break even analysis - Determination of breakeven point (simple problems )- managerial significance and limitations of BEA.

Objectives and policies of pricing-methods of pricing: cost plus pricing, sealed bid pricing, going rate pricing, market skimming pricing, penetration pricing, Two part pricing, Block pricing, Bundling pricing, Peak load pricing, cross subsidization.

#### UNIT IV

**Business and New economic policy:** Characteristics of business, features and evaluation of forms of business organization based on ownership, Nature of the economy, structure of the economy, economic policies, new economic policy 1991, economic conditions.

#### UNIT V

**Cost Accounting:** introduction- classification of costs –methods of costing – techniques of costing – preparation of cost sheet.

#### UNIT VI

**Accountancy:** Accounting principles, procedure-Double entry system-journal-ledger, Trail balance –cash book-preparation of trading, profit and loss account-Balance sheet.

#### **REFERENCES:**

- 1. Agarwal A N, "Indian Economy" Wiley Eastern Ltd, New Delhi
- 2. Jain and Narang "Accounting part-1" Kalyani publishers
- 3. Arora M.N. "Cost Accounting", Vikas publications
- 4. Ashwatappa. K "Business Environment"
- 5. Aryasri "Managerial Economics and Financial Accounting"

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#### (A1214155) MAN MANAGEMENT [Skill Development Course-3\*] (Common to CSE & IT)

#### **OBJECTIVE:**

- To inculcate Human Values and ethos and to introduce to the cultural heritage of Bharath.
- To produce IT personal committed to the creation of a happier society through IT.

#### **OBJECTIVES:**

After going through this course students will be able to

- Appreciate the importance of values in day to day life.
- \* Appreciate the great Indian heritage and what it has taught over generations
- ✤ Apply some these both at work and at home.

#### UNIT I

**LIFE STYLE OF A LEADER-MANAGER-I:** The Manager and Values-Based Management: Significance and Salient Features, Individual Character and National Character: Fundamental Requisites for an Ideal Leader-Manager [Chapters 9 & 10 from the book"Man Management"]

#### UNIT II

**LIFE STYLE OF A LEADER-MANAGER-II:** Guidelines for a Values-Based Leader-Manager: Spiritual, Personal and Business, Ideal Qualities of a Leader-Manager: Insights from Indian Scriptures [Chapters 11 & 12 from the book"Man Management"]

#### UNIT III

**FACTORS OF EXCELLENCE IN MANAGEMENT: INDIVIDUAL FACET-I:** Personality and Its Influencing Factors, Manager and Self-Concept: An Indian Perspective, In Search of Excellence in Man-Management: An Indian Perspective [Chapters 13, 14 & 15 from the book "Man Management"]

#### UNIT IV

**FACTORS OF EXCELLENCE IN MANAGEMENT: INDIVIDUAL FACET-II:** Spiritual Insights for Man-Management, Manager and Mind Control, WATCH Method of Transformational Leadership. [Chapters 16, 22 & 23 from the book "Man Management"]

#### UNIT V

**VALUES-BASED BUSINESS AND MANAGEMENT: CONCEPTUAL BACKGROUND-I:** Art and Science of Management in Ancient India, the Life Breaths of Business Management and Organization. [Chapters 4 & 5 from the book "Man Management"]

#### UNIT VI

**VALUES-BASED BUSINESS AND MANAGEMENT: CONCEPTUAL BACKGROUND-II:** Role of Values In Management Education, Roles and Responsibilities of Business Executives in the contemporary World, Need and Significance of Morality and Ethics in the World of Business And Finance.(Chapters 24,25 & 26 from the book "Man Management"]

#### **TEXT BOOKS:**

 "Man Management - A Value - Based Management Perspective", Based on The Discourses of Sri Sathya Sai Baba, Compiled by Prof. Racherla Kumar Bhaskar, Published by The Sai Publications Division, Sri Sathya Sai Students and Staff Welfare Society, Sri Sathya Sai Vidyagiri, Prasanthinilayam, August 2012 [ISBN:978-81-909128-2-2]

#### **REFERENCE BOOKS:**

References from the book "Man Management", compiled by Prof. Racherla Kumar Bhaskar

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## (A1298155) MODERN OPERATING SYSTEM LAB

#### **OBJECTIVES:**

- Grasp a fundamental understanding of computer and operating systems
- ✤ Learn the concepts and creation computer processes and threads
- Understand memory management and virtual memory concepts in modern OSes
- Understand process concurrency and synchronization
- Learn the scheduling policies of modern operating systems
- Understand the concepts of data input/output, storage and file management

#### **OUTCOMES:**

- Master various process management concepts including scheduling, synchronization and deadlocks.
- Understanding multithreading and memory management.
- $\clubsuit$  Master issues related to file system interface and implementation, disk management.

#### LIST OF EXPERIMENTS:

- 1) Case study on disk management
- 2) FCFS CPU scheduling algorithm (with given arrival time & service time) for n number of processes.
- 3) Shortest Job First scheduling
- 4) Priority scheduling algorithm
- 5) Round robin scheduling algorithm
- 6) Inter Process Communication using pipes
- 7) First fit algorithm
- 8) Best fit algorithm
- 9) Worst fit algorithm
- 10) Simulate bankers algorithm for dead lock avoidance
- 11) Simulate bankers algorithm for dead lock prevention
- 12) Simulate the MVT and MFT
- 13) FIFO page replacement
- 14) LRU page replacement
- 15) Optimal page replacement
- 16) Simulate paging technique of memory management.

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## (A1299155) WEB APPLICATION THROUH JAVA & PYTHON LAB

#### **OBJECTIVE:**

The objective of this introductory web application development program is to help students quickly acquire the core skills needed to develop web applications.

#### **OUTCOMES:**

The student should be able to:

- Installing and configuring a web server
- Writing dynamic web pages, accessing data bases and using web services
- ✤ Applying security concepts to web servers
- Designing and implementing web applications

#### **PROGRAMS TO IMPLEMENT:**

- Develop static pages (using only HTML) of an online Book store. The pages should resemble: www.amazon.com. The website should consist of the following pages. Home page, Registration and user Login, User profile page, Books catalog, Shopping cart, Payment By credit card, order confirmation.
- 2) Validate the registration, user login, user profile and payment by credit card pages using JavaScript.
- 3) Create and save an XML document at the server, which contains 10 users information. Write a program which takes User Id as input and returns the user details by taking the user information from the XML document.
- 4) Install TOMCAT web server. Convert the static web pages of assignments 2 into dynamic web pages using servlets and cookies. Hint: User's information (user id, password, credit card number) would be stored in web. Xml. Each user should have a separate shopping cart.
- 5) Redo the previous task using JSP by converting the static web pages of assignment 2 into dynamic web pages. Create a database with user information and books information. The books catalogue should be dynamically loaded from the database. Follow the MVC architecture while doing the website.
- 6) Implement a sample program using JSP Struts Framework.
- 7) Using JavaScript sort given array in ascending and descending order.
- 8) Write a method fact that takes a number from the user and prints its factorial.
- 9) Write a method rand divis 3 that takes no parameters, generates and prints a random number, and finally returns True if the randomly generated number is divisible by 3, and False otherwise. For this method we'll use a new module, the random module. At the top of your code, underneath import math, add the line import random.

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## (A0594155) C# AND .NET FRAMEWORK LAB (Common to CSE & IT)

#### **COURSE OBJECTIVE:**

• To cover the fundamental concepts of the C# language and the .NET framework.

#### **LEARNING OUTCOMES:**

- The student will gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the Framework.
- ✤ The student will gain programming skills in C# both in basic and advanced levels.
- By building sample applications, the student will get experience and be ready for large-scale projects.

#### **EXPERIMENTS**

- 1. Write a program in C# to create a base class shape and derived classes i.e., Rectangle, Circle, and Triangle. Invoke the method from base class shape using polymorphism.
- 2. Develop a C# console application to perform conversions between enums and their base types.
- 3. Write a program in C# to show that when a struct is passed to a method, a copy of the struct is passed, but when a class instance is passed, a reference is passed.
- 4. Write a program in C# to open a file to write and read and handle the exception.
- 5. Develop a sample windows application to print "Welcome to windows application programs ".
- 6. Develop C# windows application to implement the concept of constructors and destructors.
- 7. Develop C# windows application to implement single cast delegate.
- 8. Develop C# windows Application to implement multicast delegate.
- 9. Develop C# windows application to implement operator overloading.
- 10. Develop a C# application to use company logo as mouse pointer.
- 11. Develop a C# application to create table and insert data into table.
- 12. Develop a C# application to retrieve data from table record by record.
- 13. Create a Basic Web Page in Visual Web Developer
- 14. Creating a Basic Web Page in Visual Web Developer and add a button control on it.
- 15. Create User profile Application which allow user to select the Material Status and Hobbies.
- 16. Develop a ASP.NET website to implement Cross Page Submission.
- 17. Develop a ASP.NET website to implement Page Back Submission.
- 18. Develop ASP.NET Website to download a file from the server.
- 19. Develop ASP.NET Website to work with dropdown list, list boxes and button controls.
- 20. Implement the calculator with the help of the Command argument and command name properties of the button control

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## (A1215156) EMBEDDED COMPUTING (Common to CSE & IT)

#### **OBJECTIVES:**

- $\boldsymbol{\diamond}$  To distinguish the characteristics of embedded computer systems.
- ✤ To examine the various vulnerabilities of embedded computer systems.
- To evaluate/critique various protection methodologies as to their effectiveness to deter, detect, and respond to exploitation activities.

#### **OUTCOMES:**

The student will be able to:

- ✤ Acquire a working knowledge of embedded computer hardware and software architecture.
- Use Hex Editors and Basic Debuggers to navigate, reverse engineer, and modify machine-readable code.
- Examine the operation, implementation, and circumvention of various commonly employed data integrity algorithms.

#### UNIT I

#### EMBEDDED COMPUTING AND INSTRUCTION SETS:

**Embedded Computing:** Complex Systems and Microprocessors, The Embedded System Design Process, Formalisms for System Design, Model Train Controller.

**Instruction Sets:** ARM Processor.[1.1 - 1.4 and 2.2]

#### UNIT II

#### CPUS AND BUS-BASED COMPUTER SYSTEMS:

**CPUs:** Programming Input and Output, Supervisor Mode, Exceptions, and Traps, CPU Performance ,CPU Power Consumption, Design Example: Data Compressor.

**BUS-BASED COMPUTER SYSTEMS:** The CPU Bus,I/O devices, Component Interfacing, Designing with Microprocessors, Development and Debugging, System-Level Performance Analysis, Design Example: Alarm Clock.[3.1,3.2,3.5,3.6,3.7 and 4.1,4.3,4.4,4.5,4.6,4.7,4.8]

#### UNIT III

**PROGRAM DESIGN AND ANALYSIS:** Components for Embedded Programs, Models of Programs, Program Optimization, Program-Level Performance Analysis, Software Performance Optimization, Program-Level Energy and Power Analysis and Optimization, Analysis and Optimization of Program Size, Software Modem.[5.1, 5.2, 5.5, 5.6, 5.7, 5.8, 5.9, 5.11]

#### UNIT IV

**PROCESSES AND OPERATING SYSTEMS:** Multiple Tasks and Multiple Processes, Preemptive Real-Time Operating Systems, Priority-Based Scheduling, Interprocess Communication Mechanisms, Evaluating Operating System Performance, Power Management and Optimization for Processes, Design Example: Telephone Answering Machine. [6.1,6.2, 6.3, 6.4, 6.5, 6.6, 6.7]

#### UNIT V

**MULTIPROCESSORS:** Why Mulltiprocessors?, CPU's and Accelerators, Muiltiprocessor Performance Analysis, Consumer Electronics Architecture, Design Examples: Cell Phones, Compact DISCs and DVDs, Audio Players, Digital Still Cameras, Video Accelerator. [7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9]

### UNIT VI

**NETWORKS:** Distributed Embedded Architectures, Networks for Embedded Systems, Network-Based Design, Internet-Enabled Systems, Vehicles as Networks, Sensor Networks, Design Example: Elevator Controller. [8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7]

#### TEXT BOOK:

1. Computers as Components - Principles of Embedded Computing System Design, by Wayne Wolf, 2/E, Morgan Kaufmann Publishers, 2012.

#### **REFERENCES BOOKS:**

- 1. Embedded Realtime Systems Programming, Sriram V. iyer, Pankaj Gupta, Tata McGraw-Hill Pub. Co. Ltd, 2004. [Chaps 2, 3.2, 4-7]
- Embedded Systems, Raj Kamal, -Hill Pub. Co. Ltd, 11<sup>th</sup> print 2007. [Chaps 1-5, Appendix G]
- An Embedded Software Primer, David E. Simon, Pearson Education, 2007. [Chps 5-10]
- 4. Programming for Embedded Systems, Dream Software Team, WILEY dreamtech India Ltd. 2005. [has lots of excellent case studies]
- 5. Embedding system building blocks, Labrosse, via CMP publishers.

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## (A1216156) BASICS OF SCRIPTING LANGUAGES

#### **OBJECTIVES:**

The main objectives are summarized as shown below:

- Students will put their programming skills to use in constructing a complete end toend information system solution. This will often be their first opportunity to construct a non-trivial system of software.
- Students will be introduced to a number of topics that are covered in more detail in other courses. This introduction serves two purposes.
- It gives all students exposure to important technologies and components (e.g., networks, database systems and languages, clients, middleware development tools).
- Students will be better prepared to choose follow-on courses that explore some of these topics in much greater detail, improving their ability to tailor their degree
- Use perl for text and file processing.
- Execute programs from perl environment and process their result.
- Design more complex, maintainable perl programs.

#### **OUTCOMES:**

After completing this course student will Be familiar with the features of the basic Scripting Languages like: PHP and Perl.

#### UNIT I

Dynamic Content and the Web, PHP and MySQL's place in Web Development, The components of a PHP application, Integrating many sources of Information, requesting data from a web page, Installation, developing locally, working remotely, exploring PHP, PHP and HTML text, coding building blocks, PHP decision making, expressions, operator concepts, conditionals, looping.

#### UNIT II

Functions, calling functions, defining functions, object-oriented programming, Arrays, array fundamentals, Getting PHP to Talk to MySQL, the process, querying the database with PHP functions, using PEAR.

#### UNIT III

Working with Forms, building a form, templates, Practical PHP, string functions, date and time functions, file manipulation, calling system calls, modifying MySQL objects and PHP data, changing database objects from PHP, manipulating table data, displaying results with embedded links, presenting a form to add and process in one file, updating data, deleting data, performing a sub query.

#### UNIT IV

Perl History, Main perl features, compiler or interpreter, similar programming languages, popular "Myth conceptions", Perl success stories, Perl Overview: Installing and using Perl, Perl components, Perl parsing rules, Perl coding styles, Variables and data: basic naming rules, scalar variables, literals, arrays, hashes, lists, type globs, the defined function and the undefined value.

#### UNIT V

Working with files: file handles, file management, Data Manipulation: Working with numbers, working with Strings, Regular expressions, Unicode

#### UNIT VI

Complex data structures: Accessing packed data structures, references, complex structures, objects, using tie, Database Systems: Text databases, DBM database, database file locking using DBI and Win32::ODBC toolkits, SQL refresher.

#### TEXT BOOKS:

- 1. Learning PHP and MySQL, Michel E. Davis & Jon A. Phillips, O'Relly Publications.
- 2. The Complete Reference Perl, second edition, Martin C. Brown, Tata McGraw Hill edition.

#### **REFERENCE BOOKS:**

- 1. Beginning PHP and MySQL, 3rd Edition, Jason Gilmore, Apress Publications (Dream tech.).
- 2. PHP 6 Fast and Easy Web Development ,JulieMeloni and Matt Telles, Cengage Learning Publications.
- 3. PHP 5.1, I. Bayross and S. Shah, The X Team, SPD.
- 4. Perl by Example, E.Quigley, Pearson Education.
- 5. Programming Perl, Larry Wall, T.Christiansen and J.Orwant, O'Reilly, SPD.
- 6. PHP and MySQL by Example, E.Quigley, Prentice Hall(Pearson).
- 7. Perl Power, J.P.Flynt, Cengage Learning.
- 8. PHP Programming solutions, V.Vaswani, TMH.
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## (A1217156) SOFTWARE TESTING METHODOLOGIES AND TOOLS (Common to CSE & IT)

## BACKGROUND:

Software testing is an integral and important activity in every software development environment. Software seems to have has permeated almost every equipment that we use in our daily lives. This course is designed to enable a clear understanding and knowledge of the foundations, techniques, and tools in the area of software testing and its practice in the industry. The course will prepare students to be leaders in software testing. Whether you are a developer or a tester, you must test software. This course is a unique opportunity to learn strengths and weaknesses of a variety of software testing techniques.

## **OBJECTIVES:**

Upon successful completion of this course students will be able to:

- Understand the basic concepts of software testing.
- Understand the various techniques and strategies of software testing and inspection and

pointing out the importance of testing in achieving high-quality software.

- Perform effective and efficient structural testing of software.
- Integrate and test the various units and components of a software system.
- Perform effective and efficient functional testing of software.
- Select the appropriate tests to regression test your software after changes have been made.
- Plan, track and control the software testing effort.
- Understand the need of automated testing tools and various kinds of automated testing tools.

## **OUTCOMES:**

- Have an ability to apply software testing knowledge and engineering methods.
- Have an ability to design and conduct a software test process for a software testing project.
- Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation.
- Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.

## UNIT I

Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.

## UNIT II

Flow graphs and Path testing: Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

## UNIT III

Dataflow testing:-Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

## UNIT IV

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Logic Based testing: Overview, decision tables, path expressions, KV charts, and specifications

## UNIT V

Paths, Path products and Regular expressions: path products & path expression, reduction Procedure, applications, regular expressions & flow anomaly detection.

### UNIT VI

Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, overview of Some Commercial Testing Tools: Win Runner, Load Runner, QTP, Selenium

#### **TEXT BOOKS:**

1. Software testing techniques - Boris Beizer, 2nd Edition, Dreamtech.

- 1. Software Testing in the Real World Edward Kit, Pearson.
- 2. Effective methods of Software Testing, Perry, John Wiley.
- 3. Art of Software Testing Meyers, John Wiley.
- 4. Software testing Tools Dr.K.V.K.K. Prasad, Dreamtech.

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## (A1218156) DATA COMMUNICATIONS AND NETWORKING -2

## **OBJECTIVES:**

At the end of the course, the students will be able to:

- ✤ Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

## **OUTCOMES:**

After completing this course the student must demonstrate the knowledge and ability to:

- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- ◆ Identify the different types of network devices and their functions within a network.
- Understand and building the skills of sub netting and routing mechanisms.
- ✤ Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

#### UNIT I:

Transport Layer-Processes: Process-to-Process Delivery, User Datagram Protocol, Transmission Control Protocol, Stream Control Transmission Protocol (chapter 23)

#### UNIT II:

Transport Layer-Congestion: Data Traffic, Congestion, Congestion Control, Examples: Congestion control in TCP, congestion control in Frame Relay. Quality of Service, Techniques to improve QoS, Integrated Services, Differentiated Services, Quality of Service in Switched Networks (chapter 24)

## UNIT III:

Application Layer: Application Layer-Services: Domain Name System, Electronic mail, File Transfer Protocol (chapter 25,26)

## UNIT IV:

World Wide Web: Architecture, Web documents

Hiper Text Transfer Protocol: HTTP Transaction, Persistence and non persistent connection, proxy server (chapter 27)

#### UNIT V:

Application Layer-Security: Symmetric-Key Cryptography, Asymmetric-key Cryptography, Security Services, Message Confidentiality, Message Integrity, Message Authentication, IPSec, SSL/TLS, Firewalls. (chapter 30,31,32)

## UNIT VI:

Bluetoot : Architecture, Bluetooth layers, Frame format (chapter 14)

Connecting devices: Hubs, Repeaters, Bridges, Routers and Switches (chapter 15)

## **TEXT BOOKS:**

1. Behrouz A Forouzan, Data Communications and Networking,4thEdition, Tata McGraw Hill, 2007.

- 1. Data And Computer Communications, by William Stallings, 7thEdition, Pearson Education, 2005.
- 2. Computer Networks, by Andrew S. Tanenbaum, 4th Edition, Pearson Education 2003

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## (A1219156) G1.1 BASICS OF IMAGE PROCESSING (ELECTIVE-1)

## **OBJECTIVES:**

The objectives of this course are to:

- Cover the basic theory and algorithms that are widely used in digital image processing
- Expose students to current technologies and issues that are specific to image processing
- Develop hands-on experience in using computers to process images
- Familiarize with MATLAB Image Processing Toolbox
- Develop critical thinking about shortcomings of the state of the art in image processing

## **OUTCOMES:**

The student will be able to:

- Describe different modalities and current techniques in image acquisition
- Describe how digital images are represented and stored efficiently depending on the desired quality, colour depth, dynamics
- Use the mathematical principles of digital image enhancement
- Describe and apply the concepts of feature detection and contour finding algorithms.
- \* Analyze the constraints in image processing when dealing with larger data sets.

#### UNIT I

**INTRODUCTION:** Digital Image Processing, Fundamental Steps in Digital Image Processing, Components of an Image Processing System.

**DIGITAL IMAGE FUNDAMENTALS**: Elements of Visual Perception, Image Sensing and Acquisition, Image Sampling and Quantization, Some basic Relationships between Pixels, color image processing fundamentals.

## UNIT II

**IMAGE ENHANCEMENT**: Some Basic Gray Level Transformation, Histogram Processing, Enhancement Using Arithmetic/Logic Operations, Basics of Spatial Filtering, Smoothing spatial Filters, Sharpening spatial Filters.

## UNIT III

**IMAGE RESTORATION**: A Model of the Image Degradation/Restoration Process, Linear, Position-Invariant Degradations, Inverse Filtering, Minimum Mean Square Error (Wiener) Filtering, Constrained Least Squares Filtering.

## UNIT IV

**LOSSLESS COMPRESSION:** Variable length coding – LZW coding – Bit plane codingpredictive coding - DPCM. Lossy Compression: Transform coding – Wavelet coding – Basics of Image compression standards: JPEG, MPEG, Basics of Vector quantization.

## UNIT V

**MORPHOLOGICAL IMAGE PROCESSING**: Preliminaries, dilation, erosion, open and closing, hit or miss transformation, basic morphologic algorithms.

## UNIT VI

**IMAGE SEGMENTATION**: Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region-Based Segmentation.

## **TEXT BOOKS:**

 Digital Image Processing, Rafael C.Gonzalez, Richard E.Woods, 2<sup>nd</sup> Edition, Addison Wesley,1992

- 1. Image Processing. Analysis, and Machine Vision, Milan Sonka, Vaclav Hlavac, Roger Boyle, 2<sup>nd</sup> Edition, John Wiley
- 2. Image Processing Fundamentals, A.K.Jain, 2<sup>nd</sup> Edition, BPB publications.
- 3. Image Processing in C, Philips, 3<sup>rd</sup> Edition, BPP Publications.

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### (A1220156) G1.2 DATA WAREHOUSING AND DATA MINING CONCEPTS (ELECTIVE-1)

## **OBJECTIVES:**

- This course aims to provide a comprehensive introduction to data mining and data warehousing.
- The goal is to present fundamental concepts and algorithms for important topic in knowledge discovery process such as data pre-processing, data mining and postprocess evaluation.
- The students will understand the principles of these techniques and appreciate their strengths and applicability to solve problems in daily life.

#### **OUTCOMES:**

The student will be able to:

- Identify the key processes of data mining, data warehousing and knowledge discovery process;
- Describe the basic principles and algorithms used in practical data mining and understand their strengths and weaknesses;
- Apply data mining techniques to solve problems in other disciplines in a mathematical way; and
- Apply data mining methodologies with information systems and generate results which can be immediately used for decision making in well-defined business problems.

## UNIT I

**INTRODUCTION:** Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation

## UNIT II

**DATA PREPROCESSING:** Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation Data Mining Primitives, Languages, and System Architectures: Data Mining Primitives, Data Mining Query Languages

## UNIT III

**CONCEPTS DESCRIPTION:** Characterization and Comparison: Data Generalization and Summarization-Based Characterization, Analytical Characterization: Analysis of Attribute Relevance, Mining Class Comparisons: Discriminating between Different Classes, Mining Descriptive Statistical Measures in Large Databases

## UNIT IV

**MINING ASSOCIATION RULES IN LARGE DATABASES:** Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses

## UNIT V

**CLASSIFICATION AND PREDICTION:** Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Back

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propagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy

## UNIT VI

**CLUSTER ANALYSIS INTRODUCTION:** Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis

Mining Complex Types of Data: Mining Spatial Databases, Mining Multimedia Databases, Mining Time-Series and Sequence Data, Mining Text Databases, Mining the World Wide Web

## TEXT BOOKS:

1. Data Mining – Concepts and Techniques , JIAWEI HAN & MICHELINE KAMBER, 3<sup>rd</sup> Edition, Elsevier, 2011

- 1. Data Mining Techniques , ARUN K PUJARI, 2nd Edition, University Press
- Data Warehousing, Data Mining & OLAP- Alex Bezon, Stephen J.Smith, 3<sup>rd</sup> Edition, TMH
- 3. Data Mining Introductory and advanced topics ,MARGARET H DUNHAM, PEARSON
- 4. Data Warehousing Fundamentals PAULRAJ PONNAIAH WILEY
- 5. Data Warehousing in the Real World SAM ANAHORY & DENNIS MURRAY

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## (A1221156) G1.3 INFORMATION STORAGE AND MANAGEMENT (ELECTIVE-1) (Common to CSE & IT)

#### **OBJECTIVE:**

- To fill the knowledge gap in understanding varied components of modern information storage infrastructure, including virtual environments.
- To provide comprehensive learning of storage technology, which will enable students to make more informed decisions in an increasingly complex IT environment.
- To build strong understanding of underlying storage technologies and prepares students to learn advanced concepts, technologies, and products.

#### **OUTCOMES:**

- You will learn about the architectures, features, and benefits of Intelligent Storage Systems; storage networking technologies such as FC-SAN, IP-SAN, NAS, Objectbased and unified storage;
- business continuity solutions such as backup, replication, and archive;
- The increasingly critical area of information security; and the emerging field of cloud computing.

#### UNIT I

**Introduction to Information Storage**: Introduction to evolution of storage architecture, key data center elements, virtualization, and cloud computing.

**Data Center Environment:** Key data center elements – Host (or compute), connectivity, storage, and application in both classic and virtual environments.

**Data Protection: RAID:** implementations, techniques, and levels along with the impact of RAID on application performance.

## UNIT II

**Intelligent Storage Systems**: Components of intelligent storage systems and virtual storage provisioning and intelligent storage system implementations.

**Fibre Channel Storage Area Networks**: Fibre Channel SAN components, connectivity options, and topologies including access protection mechanism 'zoning", FC protocol stack, addressing and operations, SAN-based virtualization and VSAN technology,

**IP SAN and FCoE:** iSCSI and FCIP protocols for storage access over IP network, Converged protocol FCoE and its components

#### UNIT III

**Attached Storage (NAS)**: components, protocol and operations, File level storage virtualization, **Object based and unified storage**: Devices, Content-Address Storage (CAS), CAS use cases, unified storage.

**Introduction to Business Continuity**: information availability, Business Continuity (BC) terminologies, planning, failure and impact analysis, BC technology solutions.

#### UNIT IV

**Backup and Archive**: purpose, considerations, granularity. Recovery - methods, targets and topologies, Data deduplication and backup in virtualized environment, archiving solution architecture.

**Local Replication**: Replication terminology and consistency. Local replication technology, local replication in virtual environments.

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## UNIT V

**Remote replication:** remote replication methods and technologies, three-site remote replication and data migration.

### **Cloud Computing: Characteristics and benefits**

Cloud computing, definition, characteristics and benefits. Cloud service and deployment models, Cloud infrastructure components, Cloud challenges.

#### UNIT VI

**Securing the Storage Infrastructure:** framework and domains of storage security along with covering security, implementation at storage networking. Security threats, and countermeasures in various domains Security solutions for FC-SAN, IP-SAN and NAS environments, Security in virtualized and cloud environments.

**Managing the Storage Infrastructure**: Monitoring and managing various information infrastructure components in classic and virtual environments, Information lifecycle management (ILM) and storage tiering, Cloud service management activities.

### **TEXT BOOKS:**

 Information Storage and Management,<sup>2nd</sup>edn.Author :EMC Education Services, Publisher: India edn., (2012). ISBN: 9781118094839 {Unit-I: Chps 1-3, Unit-II: Chps 4-6, Unit III: Chps 7-9, Unit IV: Chps 10-11, Unit V: Chps 12-13, Unit VI: Chps 14-15}

#### **REFERENCE BOOKS:**

1. Storage Virtualization, Author: Clark Tom, Publisher: Addison Wesley Publishing Company ISBN : 9780321262516

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## (A1222156) G2.1 MACHINE LEARNING (ELECTIVE-2/MOOC) (Common to CSE & IT)

#### **OBJECTIVES:**

- ✤ To introduce students to the basic concepts and techniques of Machine Learning.
- To develop skills of using recent machine learning software for solving practical problems.
- ✤ To gain experience of doing independent study and research.

#### **OUTCOMES:**

- Understand a number of models for supervised, unsupervised, and reinforcement machine learning
- Describe the strength and weakness of each of these models

#### UNIT I

Introduction: what is machine learning? Supervised learning, unsupervised learning

Linear regression with one variable: model representation, cost function, gradient descent, gradient descent for linear regression.

Linear regression with multiple variables: multiple features, gradient descent for multiple variables, gradient descent in practice- feature scaling, learning rate, features and polynomial regression, normal equation.

#### UNIT II

Logistic regression: classification, hypothesis representation, decision boundary, cost function, simplified cost function and gradient descent.

Multiclass classification: one-vs.-all.

Regularization: the problem of over fitting, cost function regularized linear regression, regularized logistic regression.

## UNIT III

Neural networks: representation: non-linear hypotheses, neurons and the brain, model representation, examples and intuitions, multiclass classification.

Neural networks: learning: cost function, back propagation algorithm, Back propagation intuition, implementation- unrolling parameters, gradient checking, random initialization, putting it together, autonomous driving,

## UNIT IV

Advice for applying machine learning: Deciding what to try next, evaluating a hypothesis, model selection and train/validation/test sets, diagnosing bias vs. variance, regularization and bias/variance, learning curves.

Machine learning system design: prioritizing what to work on, error analysis, and error metrics for skewed classes, trading off precision and recall, data for machine learning.

## UNIT V

Support Vector Machines: optimization objective, large margin intuition, kernels, using an SVM.

**Clustering**: unsupervised learning: introduction, k-means algorithm, optimization objective, random initialization, choosing the number of clusters.

Dimensionality reduction: motivation: data compression, visualization. formulation and Choosing the number of principal components, reconstruction from compressed representation, advice for applying PCA.

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## UNIT VI:

Application example: photo OCR- problem description and pipeline, subtitles (text) for problem description and pipeline, subtitles (srt) for problem description and pipeline, video (mp4) for problem description and pipeline. Sliding windows, getting lots of data and artificial data.

## TEXT BOOK:

- 1. Source for the Course Content: Machine Learning, Andrew Ng., https://www.coursera.org/.
- 2. Pattern Recognition and Machine Learning, Christopher M. Bishop, Springer, (2006), ISBN: 13:978-0387-31073-2

- 1. A First Course in Machine Learning, Simon Rogers, Mark Girolami, CRC Press, (2012), ISBN:978-1-4398-2414-6
- 2. Machine Learning: An algorithmic Perspective, Stephen Marslad, Chapmann & Hall/crc, (2009),ISBN: 9781420067187
- 3. Machine Learning: A probabilistic approach, Kevin P. Murphy,
- 4. Machine Learning, Tom Mitchell, McGrahill (1997), ISBN 0070428077
- 5. Introduction to Data Mining, Pang-Ning Tan, Michael Steinberg, Vipin Kumar, Morgan Kaufmann Pub. (2011), ISBN: 978-0-12-374856-0.
- 6. Machine Learning with SVM and Other Kernael Methods, K.P.Soman, R. Loganathan, V. Ajay, PHI Learning (2009)

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## (A1223156) G 2.2 NATURAL LANGUAGE PROCESSING (ELECTIVE-2/MOOC)

## **OBJECTIVES:**

The main objective of this course is to introduce the students to the underlying problems when facing with natural languages data.

This course has the following objectives:

- to understand the problems related to representation and manipulation of text data;
- to understand the statistical properties underlying in all text data;
- to understand the main approaches in NLP;

## **OUTCOMES:**

The student will be able to:

- Understand the fundamentals of natural language processing
- Understand how NLP relates to search engines
- Understand how NLP relates to text mining
- Understand how NLP relates to decision support tools

## UNIT I

Introduction - Issues and difficulties in NLP – Study of language – Evaluating Language understanding Systems – the different levels of language – representations – Organization of NLP systems – Linguistic issues – Types of NLP Systems.

## UNIT II

Grammars and Parsing Language Hierarchies and Complexity -Grammars and sentence structures – A top down parser – a bottom up chart parser – top down chart parsing – Finite state models and morphological analysis and the Lexicon

## UNIT III

Grammars and Logic programming –Augmented grammars – A simple grammar with features – Parsing with features –Augmented Transition Networks (ATN) – Definite clause grammars – Efficient parsers –Shift reduce parsers – A deterministic parsers - Lexicalised and Probabilistic Parsing.

## UNIT IV

Three System types of Semantics and logical forms – Defining semantic structure: Model theory –Semantic interpretation and composability –A simple grammar and lexicon with semantic interpretation – Prepositional phrases and verb phrases – Lexicalised semantic interpretation and semantic roles – Semantic networks – Frames and scripts- Truth, Meaning and Ontology –Word Net.

## UNIT V

Language Communication: Adding Language - Modeling reference – Defining Local Discourse context and Discourse entities – The need for discourse structure – Discourse interpretation – Pragmatics.

## UNIT VI

Typical Systems: Generation – Strategies for generation – Planning English referencing expression Architecture of Natural Language Generation System – Typical systems – ELIZA Baseball

## TEXT BOOKS:

- 1. James Allen "Natural Language Understanding", Benjamin / Cummings Publishing Co., 1995.
- 2. Ronald Hausser "Foundations of Computational Linguistics", Springer-Verleg, 1999.

- 1. Gerald Gazer and Chris Mellish, "Natural Language Processing for PROLO Gprogrammers" PHI –1995.
- Ashkar Bharathi, Vineetchaitanya and Rajeev Sangal, "Natural Language Processing – a Paining Perspective" –PHI-1995.
- 3. Ralph Grishman, "Computational Linguistics an introduction", Cambridge university press 1986.

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## (A1224156) G2.3 PROGRAMMING MOBILE APPLICATIONS FOR ANDROID HANDHELD SYSTEMS (ELECTIVE-2/MOOC)

### **OBJECTIVE:**

- ✤ To design and implement Android applications for mobile devices.
- To develop an app from scratch, assuming a basic knowledge of Java, and learn how to set up Android Studio, work with various Activities and create simple user interfaces to make your apps run smoothly.

#### **OUTCOMES:**

- Understand the existing state of mobile app development via researching existing apps, meeting with industry professionals, and formulating new ideas.
- Display proficiency in coding on a mobile programming platform.
- Understand the limitations and features of developing for mobile devices.
- Create a complete Mobile app with a significant programming component, involving the sensors and hardware features of the phone.

#### UNIT 1:

Introduction: Android, Platform and Development Environment, using various tools in the Android Development Environment, Developing Android applications.

#### UNIT 2:

Fundamental components of Android applications, lifecycle of the Activity class, develop a simple Android application

## UNIT 3:

Intent class and Permissions, Fragment class, designing applications that run on multiple, differently-sized devices, sophisticated and elegant Android user interfaces.

## UNIT 4:

Threads, Async Task & Handlers, Networking, Display Tweet Data App User Notifications, The Broadcast Receiver Class, Alarms, Tweet app

## UNIT 5:

Graphics & Animation, Multi-touch & Gestures, MultiMedia, Bubble Popper app

#### UNIT 6:

Sensors, Location & Maps, Data Management, Place Badge Collector app

#### **TEXT BOOKS:**

- 1. Source for the Course Content: Programming Mobile Applications for Android Handheld Systems, https://www.coursera.org/.
- 2. Reto Meier, "Professional Android Application Development", Wrox Publications.
- 3. Zigurd Mednieks, Laird Dornin, G. Blake Meike, Masumi Nakamura, "Programming Android", O'Reilly Publications, 2012

- 1. Greg Milette, Adam Stroud, "Professional Android Sensor Programming", Wrox Publications, 2010.
- 2. Dawn Griffiths, David Griffiths,"Head First Android Development", O'Reilly publications, 2015.

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## (A0013156) PROFESSIONAL ETHICS AND SOFT SKILLS (Soft Skill Development Course-4\*) (Common to all branches)

### **OBJECTIVES:**

The recent past decades have witnessed a dilemma of performance on ethical grounds. A professional be able to carry out tasks and achieve success at societal level. The syllabus has been designed keeping in view of the needs and goals of the generation next undergraduates. It comprises essentials of professional ethics embedded with soft skills which in turn mould students as dynamic professionals. The course of **Professional Ethics and Soft Skills** has been designed with the following objectives.

- To ignite the spark of professionalism among students with the purpose to acquire success at societal level.
- ✤ To enable them to accomplish tasks balancing hard skills and soft skills.
- To develop critical thinking skills and emotions of students through recent research theories.
- The greatest contribution of this course shall be to shape human skills of students at the global level.

#### **OUTCOMES:**

- Be able to acquire professional ethics & Job Etiquettes
- ✤ Be able to balance hard skills and soft skills.
- ✤ Considerable improvement in communicative ability.
- Increase in motivational level and Professional attitudes.
- ✤ Be able to possess wide range of relevant knowledge.

## UNIT I

**NATURE AND SCOPE OF ENGINEERING ETHICS:** Definition, Nature, Scope – Moral Dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory, the characteristic traits of real professional, Moral Reasoning and Ethical theories – Theories of Right Action, Self – interest- Use of ethical Theories- case study.

## UNIT II

**PROFESSIONAL ETIQUETTES:** Professional Etiquettes – Mobile Etiquettes – Email Etiquettes -Kinesics – Proxemics - Chronemics – Chromatics – Olfacts - Haptics – Case Study.

## UNIT III

**CORPORATE COMMUNICATION:** Communication models- Types of Communication – downward and upward communication Business Deliberations – Meetings – Negotiation Skills - Case Study.

## UNIT IV

**SOFT SKILLS:** Interpersonal Communication – Johari Window – Interpersonal conflict resolutions- Daniel Goleman's Emotional Intelligence.

## UNIT V

**GLOBAL ISSUES:** Multinational corporations – cross-cultural communication-Environmental ethics – Computer – ethics –Terrel Ward Bynum's concept of computer ethics - Weapons developments- case study.

## UNIT VI

**INTRODUCTION TO INTELLECTUAL PROPERTY:** Meaning and Types of Intellectual Property – recent developments of the copy right act – plagiarism – trademark protection – patent law.

## TEXT BOOKS:

- 1. Charles D.Fleddermann [1999], *Engineering Ethics*, Prentice Hall Publishers, New Mexico.
- 2. Business Communication , P.D. Chaturvedi, Mukesh Chaturvedi

## **REFERENCES:**

- 1. The ACE of Soft Skills(Attitude, Communication and Etiquette for success) by Gopalaswamy Ramesh & Mahadevan Ramesh, Pearson 2010.
- 2. Essentials of Business Communication, Rajendra Pal, JS.Korlahhi, S.Chand
- 3. Intellectual Property Right, Deborah E. BouchouxS, Cengage, 2005
- 4. Business Ethics and Professional Values, A.B. Rao, Excel, 2009
- 5. M.P. Raghavan [2006], Professional Ethics And Human Values, Scitech Publications, Chennai.

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## (A1281156) EMBEDDED COMPUTING LAB

## **OBJECTIVES:**

To familiarize students to embedded systems' programming on ARM's "MBED" microcontroller.

## **OUTCOMES:**

The student will be able to:

- ✤ Describe the architectural features of ARM's "MBED" microcontroller
- Use Keil simulator and develop and test applications
- Write standard embedded application programs

Implement the following problem on the following topics on 'mbed' ARM microcontroller. Introduction to 'mbed 'architecture and Keil compiler software

## LAB EXERCISES:

- 1. Digital Output on the mbed using LEDs.
- 2. Digital Output using mbed external pins.
- 3. Digital Inputs by connecting switches to a digital system.
- 4. Analog Outputs on the mbed.
- 5. Combining Analog Input and Output.
- 6. Processing Data from Analog Inputs.
- 7. Exploring Data Conversion Timing.
- 8. Implementing a Seven- Segment Display Counter.
- 9. Function Reuse.
- 10. Serial Communication.
- 11. Liquid Crystal Displays.
- 12. Timers and Interrupts.

## **TEXT BOOK:**

1. "Fast And Effective Embedded Systems Design, Applying the ARM mbed" by Rob Toulson, Tim Wilmshurst, Elsevier, 2012

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## (A1282156) BASICS OF SCRIPTING LANGUAGES LAB

## **OBJECTIVE:**

- ◆ Analyse requirements of software systems for the purpose of determining the suitability of implementing in Perl or Python;
- ◆ Analyse and model requirements and constraints for the purpose of designing and implementing software systems in Perl and Python;
- Evaluate and compare designs of such systems on the basis of specific requirements and constraints.

#### **OUTCOMES:**

- \* Explain the differences between typical scripting languages and typical system and application programming languages.
- ✤ Apply knowledge of the strengths and weaknesses of scripting languages to select an implementation language.
- Create software systems using scripting languages, including Perl and Python.
- Write server-side scripts using Perl and Python's CGI facilities

#### **Experiments**

- 1. Write a HTML file to create a simple form with 5 input fields Name, Password, Email, Pin code, Phone No. and a Submit button.
- 2. Write a PHP program to demonstrate required field validations to validate that all input fields are required.
- 3. Write a PHP program to validate Name, Email and Password.
- 4. Write a PHP program to display error messages if the above validations do not hold.
- 5. Create a form for your college library entering student details for each student in the college. Validate the form using PHP validators and display error messages.
- 6. Create a PHP program to demonstrate opening and closing a file.
- 7. Create a PHP program to demonstrate reading a file.
- 8. Create a PHP program to demonstrate writing in a file.
- 9. Create a PHP program to read the contents from a text file and also write the same contents to another file?
- 10. Write a program in PHP to print the count of word the as an independent word in a text file STORY. TXT. For example, if the content of the file STORY.TXT is "There was a monkey in the zoo. The monkey was very naughty." Then the output of the program should be 2.
- 11. a) Write a Perl program to display various Server Information like Server Name, Server Software, Server protocol, CGI Revision etc. b) Write a Perl program to accept UNIX command from a HTML form and to display the output of the command executed.
- 12. a) Write a Perl program to accept the User Name and display a greeting message randomly chosen from a list of 4 greeting messages. b) Write a Perl program to keep track of the number of visitors visiting the web page and to display this count of visitors, with proper headings.
- 13. Write a Perl program to display a digital clock which displays the current time of the server.
- 14. Write a Perl program to insert name and age information entered by the user into a table created using MySQL and to display the current contents of this table.

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## (A1283156) SOFTWARE TESTING TOOLS LAB (Common to CSE & IT)

## **OBJECTIVES:**

Upon successful completion of this course students will be able to:

- ✤ Understand the basic concepts of software testing.
- Understand the various techniques and strategies of software testing and inspection and pointing out the importance of testing in achieving high-quality software.
- Perform effective and efficient structural testing of software.
- Integrate and test the various units and components of a software system.
- Perform effective and efficient functional testing of software.
- Select the appropriate tests to regression test your software after changes have been made.
- Plan, track and control the software testing effort.
- Understand the need of automated testing tools and various kinds of automated testing tools.

## **OUTCOMES:**

- Have an ability to apply software testing knowledge and engineering methods.
- Have an ability to design and conduct a software test process for a software testing project.
- Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation.
- Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.

## Lab Experiments:

Manual Testing Programs

- 1. Write Test cases for Gmail login here user Id and Password should be 8 or more characters length, it is a combination of alphabets Digits, and special symbols but not allow space.
- 2. Write Test cases for Ram went to ATM machine to draw money of 30000, Pin number must be4 characters/ digits or both the machine gives only Rs 100 notes, and for each transaction the machine gives only Rs 20000 and per day transaction amount is Rs 40000 only

## **QTP Programs**

- 3. Introduction about Quick Test Professional
- 4. Create a script for the case "Raju wants to travel five cities from Frankfurt to London, Japan, Germany, Indonesia, and Malaysia on 20-12-2016; He wants to List out which of the places is successful travel and which of the places is unsuccessful travel for the Flight Reservation application".
- 5. Create a script for the case "admin verifying the existing customer name of order number five with 5 other people's name such as Ranga, Ramu, Rajesh, Ritesh, and Kiran , For verifying the application functionality. And he wants to know the status of the delete order button functionality w.r.t to Update order button functionality for the same order number."

- 6. Create a script to login into Flight Reservation Application and fill date of journey from Frankfurt to London and the name of the customer is Raju he is travelling with family members of 5, he wants to know the individual ticket price and Total ticket price without \$ symbol.
- 7. Create a script for the case "Rangaraju wants to travel from Frankfurt to London on 21-12-2016, he booked a ticket with the name Ranga, but he got a doubt after few days he wants to verify with what name he booked a ticket he knows only the order num." so he needs to verify name exist in the open order window and the name in the edit box of Flight Reservation Window same or not?

## Selenium Programs

- 8. Introduction about Selenium
- 9. Rajesh created a new website he was eagerly waiting for launching the website before launching he wants check out all the details such as first he started according to requirements how many number of links are there, weather that links are correctly navigating or not and how many Images are there, those images user specified or not, is it user specified text or not using Selenium IDE web testing tool.
- 10. Admin needs to check the functionalities of Website such as find element list from web list , what is the size of the List , and the navigation specified is correct or not according to user requirements.

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## (A1225157) THEORY OF COMPUTATION

#### **OBJECTIVES:**

The primary objective of this course is to introduce students the areas of computability and complexity, fundamental topics in computer science. The course also facilitates life-long learning in computer science by providing the student with foundational material that continues to be applicable even as the discipline rapidly evolves.

## **OUTCOMES:**

The student will be able to:

- Develop finite state machines for regular languages
- Prove a language is not regular
- Convert a NFA to a DFA
- Recognize regular grammars
- Develop regular grammars for regular languages
- Prove facts about unions, intersections, complements of regular languages
- Develop PDAs for context-free languages
- Develop Turing Machine

#### UNIT I

**INTRODUCTION:** Introduction to Finite Automata, Structural Representation, Automata and Complexity, Alphabets, Strings, Languages, Problems, Acceptance of a string, Additional forms of proof.

## UNIT II

**FINITE AUTOMATA:** Deterministic Finite Automata, Nondeterministic Finite Automata, Finite automata with epsilon- transitions, Melay and Moore machines

#### UNIT III

**REGULAR EXPRESSIONS AND REGULAR LANGUAGES:** Regular Expressions, Finite Automata and Regular Expressions, Proving languages not to be regular, Closure Properties of Regular Languages. Equivalence and minimization of Automata: Minimization of DFA's.

#### UNIT IV

**CONTEXT- FREE- GRAMMERS & PUSHDOWN AUTOMATA:** Context-Free Grammars: Definition, Derivations, Leftmost and Right most Derivations. Parse trees, Ambiguity in Grammar and languages: ambiguous grammar, Properties of Context-Free Languages: Normal forms for CFG, Pumping Lemma for CFL.

Push Down Automata: Definition of PDA, The Languages of PDA, Equivalence of PDA's and CFG's, Deterministic Push down Automata.

#### UNIT V

**TURING MACHINE:** The Turing Machine: Notation for the Turing Machine, Instantaneous description, Transition diagram, the language of TM, Turing machine and Halting

Extension to the Basic TM: Multitape TM, Equivalence of One-Tape and Multitape TM's, Nondeterministic Turing Machines.

Restricted TM: Counter Machines, The power of Counter Machines.

## UNIT VI

**UNDECIDABILITY & INTRACTABLE PROBLEMS:** An undecidable problem that is RE, Undecidable problems about TM, Post's Correspondence Problem.

Intractable Problems: class P and NP, NP complete problem

## TEXT BOOKS:

- 1. Introduction to Automata Theory, Languages, and Computation, John E. Hopcroft, Jeffery D. Ullman, Rajeev Motwani, Third Edition, Pearson Education
- 2. Theory of Computer Science , K.L.P Mishra, N. Chandrasekharan ,Second Edition, PHI

- 1. Introduction to Formal Languages, and Automata, Peter Linz, 3rd Edition, Narosa
- 2. The Theory of Computation, Bernard M.Moret, Pearson Education.

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## (A1226157) INFORMATION SECURITY (Common to CSE & IT)

## **OBJECTIVES:**

This course covers the major aspects of computer and network security. It starts with a general introduction to information security, then proceeds to cover types of threats and attacks, hacking techniques, network vulnerabilities, security policies and standards, firewalls, cryptography, Authentication & digital signatures, the SSL protocol, Wireless security, intrusion detection and prevention

## **OUTCOMES:**

The student will be able to:

- Define information security and outline its major components.
- Identify the major types of threats to information security and the associated attacks.
- Develop strategies to protect organization information assets from common attacks.
- Understand how security policies, standards and practices are developed.
- Understand the role of management in enforcing security policies, standards and practices.
- Identify the major techniques, approaches and tools used to discover network and system vulnerabilities.
- Understand firewalls and packet filtering.

## UNIT I

Security goals, Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, ARP attacks, route table modification and man-in-the-middle attacks.

## UNIT II

Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

## UNIT III

Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

## UNIT IV

**Email privacy:** Pretty Good Privacy (PGP) and S/MIME.

## UNIT V

**IP Security:** Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management. **Web Security:** Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

## UNIT VI

Intruders, Viruses and related threats. Firewall Design principles, Intrusion Detection Systems.

## TEXT BOOKS:

- 1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
- 2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuik and Ryan Permeh, wiley Dreamtech

- 1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
- 2. Network Security Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
- 3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson.
- 4. Principles of Information Security, Whitman, Thomson.
- 5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
- 6. Introduction to Cryptography, Buchmann, Springer.

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## (A1227157) MOBILE COMPUTING

### **OBJECTIVES:**

- Introduction of an advanced element of learning in the field of wireless communication
- introduces the basic concepts and principles in mobile computing
- Expose the students to the concepts of wireless devices and mobile computing.

## OUTCOMES:

At the end of this course the student should be able to

- Students to understand the concept of mobile computing and architecture of mobile communication.
- Students to apply the concepts of mobile communications to the transactions and transaction management
- ✤ Apply the concepts of mobile computing on conventional wired networks
- Students to understand the working of heterogeneous networks.

## PREREQUISITES:

- $\boldsymbol{\diamond}$  The knowledge about the spectrum and information the radio waves.
- The knowledge of Computer networks and protocols is essential.

#### UNIT I

**Introduction to Mobile Communication and Computing:** Novel applications – Limitations - Architecture

**GSM:** Mobile services, System architecture, Radio Interface, Protocols, Localization and calling, Handover, Security, New data Services

## UNIT II

**(Wireless) Medium Access Control:** Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

## UNIT III

**Mobile Network Layer:** Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, tunneling and encapsulation), Dynamic Host Configuration Protocol (DHCP), Properties and Applications of a MANETs - Routing – DSDV – DSR

## UNIT IV

**Mobile Transport and Application Layer:** Traditional TCP - Indirect TCP - Snooping TCP - Mobile TCP - Fast retransmit/Fast recovery - Transmission/time-out freezing - Selective retransmission - Transaction Oriented TCP - Wireless Application Protocol

## UNIT V

**Database Issues:** Hoarding techniques - caching invalidation mechanisms - client server computing with adaptation - power-aware and context-aware computing - transactional models - query processing – recovery - Quality of service issues.

## UNIT VI

**Data Dissemination:** Communications asymmetry - classification of new data delivery mechanisms - push-based mechanisms - pull-based mechanisms - hybrid mechanisms - selective tuning (indexing) techniques.

## TEXT BOOKS:

- 1. JochenSchiller, "MobileCommunications", *Addison-Wesley*. (Chapters, 7, 9, 10, 11), second edition, 2004.
- 2. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", *Wiley*, 2002.

- 1. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October 2004.
- Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw-Hill Professional, 2005.
- 3. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", *Springer*, second edition, 2003.
- 4. MartynMallick, "Mobile and Wireless Design Essentials", Wiley DreamTech, 2003.

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## (A1228157) CLOUD INFRASTRUCTURE AND SERVICES (Common to CSE & IT)

## **OBJECTIVES:**

- Explain the importance and benefits of Cloud computing and the need for its rapid adoption
- Explain roadmap for transformation from classic to cloud environment
- Identify and differentiate various infrastructure components of classic and virtualized data centre
- Explain virtualization requirements and available tools at each layer of IT infrastructure
- Explain business continuity options in a virtualized environment
- Discuss effective cloud computing deployment model for businesses/IT organizations
- Perform detailed exploration of cloud products and services
- Describe infrastructure framework and service management activities in Cloud computing
- Understand and address security concerns commonly found in Cloud computing environments
- Formulate high-level cloud migration strategy and best practices

## **OUTCOMES:**

Upon successful completion of this course, participants should be able to:

- Explain the phases of transition from classic data center to virtual data center and then to the Cloud
- Describe virtualization technology at server, storage, network, desktop, and application layers of IT infrastructure
- Describe business continuity solutions in a VDC environment
- Explain the key characteristics, services, and deployment models of Cloud
- Describe the Cloud infrastructure components and service management processes
- Describe Cloud security concerns and solutions
- List the key considerations for migration to the Cloud

## UNIT I

**Journey to the Cloud:** This unit focuses on the business drivers, definition, essential characteristics, and phases of journey to the Cloud. Business drivers for Cloud computing, Definition of Cloud computing, Characteristics of Cloud computing as per NIST, Steps involved in transitioning from Classic data center to Cloud computing environment.

## UNIT II

**Classic Data Center (CDC):** This unit focuses on the key elements of CDC – compute, storage, and network, with focus on storage networking, business continuity, and data center management. Application, DBMS, Compute, Storage and Networking, Object based and Unified storage technologies, Business continuity overview and backup, Replication technologies, CDC Management.

## UNIT III

**Virtualized Data Center (VDC) – Compute and Storage:** VDC Compute: compute aspect of the VDC, fundamental concepts of compute virtualization and techniques,

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virtual machine (VM) components and management of compute resources, process to convert physical machine to VM.

VDC Storage: storage virtualization implementation, key underlying technologies, methods for providing virtual storage to compute systems in a VDC environment.

## UNIT IV

**Virtualized Data Center (VDC) – Networking and desktop applications:** VDC Networking: network virtualization in VDC, VDC network infrastructure and components, virtual LAN, and virtual SAN. key network traffic management techniques. VDC Desktop and Application: the various aspects of desktop and application virtualization technologies.

Business Continuity in VDC: concepts and techniques employed for ensuring business continuity, mechanisms to protect single point of failure, various technology options for backup, replication, and migration of VMs and their data, various options for recovering from total site failure due to a disaster.

## UNIT V

**Cloud Computing and Infrastructure:** Cloud Computing Primer: essential characteristics of Cloud Computing, Cloud services and deployment models, the economics of Cloud.

Cloud Infrastructure and Management: Cloud infrastructure components, Cloud service creation processes. Cloud service management processes, delivery of Cloud services is aligned with business objectives, expectations of Cloud service consumers.

## UNIT VI

**Cloud Security and Migration to cloud:** Cloud Security: Security concerns and counter measures in a VDC and Cloud environment, Key security concerns and threats, infrastructure security mechanisms in VDC and cloud environments, access control, identity management, governance, cloud security best practices.

Cloud Migration Considerations: considerations for migration to the cloud, details 'cloud models' suitable for different categories of users, governance, risk and compliance aspects in Cloud, considerations for choosing applications suitable for Cloud, different phases to adopt the Cloud.

## **REFERENCE BOOKS:-**

- 1) **Cloud Computing: A Practical Approach** Author: Anthony T. Velte, Publisher: Tata McGraw Hill Education Private Limited (2009), ISBN: 0070683514
- 2) **Cloud Computing For Dummies** Author: Halper Fern, Kaufman Marcia, Bloor Robin, Hurwit Judith, Publisher: Wiley India Pvt Ltd (2009), ISBN: 8126524871

## **PREREQUISITES:**

Students who have completed courses on the following topics will have an added advantage in successfully completing the CIS course:

- 1. Computer systems and architectures
- 2. Networking technologies
- 3. Operating system
- 4. Information storage and management

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T C 3+1\* 3

## (A1229157) G3.1 MIDDLEWARE TECHNOLOGIES ANDSERVICE ORIENTED ARCHITECTURE (Elective-3)

## **OBJECTIVES:**

- Course will primarily deal with the idea of service-oriented architecture (SOA) and apply it to the domain of educational resources. It has the overall aim of demonstrating how a set of application interfaces can be used to deliver services to learners and learning facilitators.
- Illustrating the concept of SOA, the Open ICOPER Content Space (OICS) together offer an umbrella for combining a portfolio of interoperable repositories, content and tools, where the services, quality attributes and design principles of a SOA are well represented.

## **OUTCOMES:**

The student will be able to:

- Describe Service Oriented Architecture (SOA) principles (the basic methodology employed for the OICS creation);
- Understand the usages and services provided by the Open ICOPER Content Space (OICS) as an example of SOA learning content;
- Identify the ICOPER Reference Model (IRM) that regroups the shareable online content;
- Give examples relating to how the Middle Layer API facilitates the implementation of OICS client interfaces

## UNIT- I

**Introduction to Middleware:** What is Middleware? Types of Middleware, Client Server computing, Benefits and pitfalls of client server programming. Multi-tiered architecture, distributed computing models, RPC Middleware, java RMI.

## UNIT –II

**Web Service Technologies:** Introduction. Where does WS fit into Middleware? WS Standards - XML/XSLT, SOAP, WSDL, REST, BPEL, Frameworks & Utilities - Axis, etc.

## UNIT – III

**Enterprise Architecture Integration (EAI):** What is Integration? Intro to EAI - definition of concepts involved - EDI, B2B Integration, Legacy integration, EAI Infrastructure, ESB, EAI Solution utilities - TIBCO

## $\mathbf{UNIT} - \mathbf{IV}$

**EJB Architecture & Applications:** Overview of EJB Architecture, View of EJB Conversation, Building and deploying EJBs, Role in EJB. EJB Session beans, EJB Entity beans, Lifecycle of beans, EJB Clients, Steps in developing an application with EJB, EJB deployment.

## $\mathbf{UNIT} - \mathbf{V}$

**Service Oriented Architecture-1:** Review of basic tiered architecture-EA and the basic points of benefit of SOA including better integration, business agility, asset re-use, increase ROI.

Web Services and SOA - XML over the Http protocol. Representational State Transfer(REST). Main java implementations of web services JAX-WS 2, Axis2, Spring-WS, and XFire/CXF 2.0.

## UNIT – VI

**Service Oriented Architecture-2:** Data and Services –review of JDO (Java Data Objects) as an alternative to JDBC along with sample code and examples. Service Data Objects (SDO). Apache Tuscany DSO. Service Component Architecture (SCA) with a Tuscany SCA java example. Benefits of MOM and ESB. Open ESB

## TEXT BOOKS:

- 1. Middileware and Enterprise Integration techniques, by Sudha Sadasivam G. and Radha Shankarmani, 2009, WIND.
- 2. Programming With Middleware Technologies, S Anitha and M Gomathi, Ane Books Pvt. Ltd (2011).
- 3. Service Oriented Architecture with Java" by Binildas CA, Malhar Barai, and Vicenzo.

- 1. Distributed Computing, Principles and applications, M.L.Liu, Pearson
- 2. Client/Server Computing D.T.Dewire, TMH.
- 3. Programming C#, Jesse Liberty, SPD-O'Reilly.

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## (A1230157) G 3.2 SAP-ABAP AND BASIC APPLICATIONS (Elective-3)

## **OBJECTIVES:**

- Student will learn about the SAP ABAP Programming Language and how to use the SAP ABAP Workbench tools to develop basic applications.
- The course objective is to understand the concepts of Procedure and Object Oriented Programming in SAP ABAP to develop various applications, and to understand the concepts of ABAP Objects.
- It allows understanding the Data Dictionary and Open SQL which include in basic concepts of SAP ABAP to manipulate the data in database.
- It allows to build graphical user interface and to handle various events.

## **OUTCOMES:**

- ✤ Understand and use the basic programming concepts of SAP ABAP.
- Design, develop the code, check, activate and run the programs and database tables using SAP ABAP Workbench tools.
- Understand and use the basic SAP ABAP application concepts to be able to develop the applications.
- After completing the course, participants should able to: Understand the advantage of ERP tools, working with SAP ABAP Workbench Tools, basic programming concepts in ABAP, Working with database through ABAP data dictionary, Open SQL and Internal Tables, Understand and develop the basic applications.

## UNIT I

What is ERP?, Why we need ERP?, Advantages of ERP, Major ERP Packages, What is SAP?, History & Features of SAP, SAP R/2 Architecture (Limitations of R/2 Architecture), SAP R/3 Architecture (Types of work processes), SAP R/3 Application Modules, SAP Landscape, What is ABAP?, Logon to SAP Environment, Transaction Codes.

**Programming Concepts:** ABAP/4 Editor (SE38), Steps for Creating a Program, Elements in R/3 Screen, ABAP Syntax, Comments, Errors, Write Statements, Data, Data types, variables, parameters, system variables, control statements, string operations.

## UNIT II

**ABAP Dictionary:** Introduction, Exploring Domain, Data types, Types Groups, Database Tables, structures, append structures, views, and search helps, lock object, Primary key and foreign key.

**Internal Table:** Introduction, types of internal table, Declaring Internal Table, Populating Internal Table, Processing Internal Table, Initializing Internal Tables, Control Break processing.

## UNIT III

**OPEN SQL:** Accessing Database Tables, Reading data using select statement, insert, update, modify, delete.

**Modularization Techniques**: Working with subroutines, Macros, Function Modules.

## UNIT IV

**REPORTS:** Working with classical reports, interactive reports, ALV Reports.

## UNIT V

**ABAP User Dialogues:** Introduction, introducing dialog programming, screen painter, menu painter, working with selection screens.

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## **INFORMATION TECHNOLOGY**

**Forms in SAP:** Exploring the SAP script tool, The SAP smart Forms Tool, Comparing SAP Script and smart Forms, migrating SAP script forms to smart Forms.

## UNIT VI

**OOPS Concepts:** Encapsulation, Abstract, Polymorphism, Inheritance, Defining OOPS Concepts local and Global.

## TEXT BOOKS:

- 1. SAP ABAP/4, Covers SAP ECC 6.0 Black Book, Kogent Learning Solutions Inc., DreamTech Press.
- 2. "Introduction to ABAP/4 programming for SAP" by Gareth M.de.Bruyn& Robert Lyfareff; Publisher: Galgotia pub.

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T C 3+1\* 3

RGM-R-2015

## (A1231157) G 3.3 SOFTWARE PROJECT MANAGEMENT (Elective-3)

## **OBJECTIVE:**

The objective of the course is to familiarize students in practice with the initiation, management and supervision of a software project. During the course, actual software projects are defined and their implementation is managed and supervised. To provide basic project management skills with a strong emphasis on issues and problems associated with delivering successful IT projects. The module is designed to provide an understanding of the particular issues encountered in handling IT projects and to offer students methods, techniques and 'hands-on' experience in dealing with them.

#### **OUTCOMES:**

The student will be able to:

- Understand and practice the process of project management and its application in delivering successful IT projects;
- evaluate a project to develop the scope of work, provide accurate cost estimates and to plan
- the various activities;
- understand and use risk management analysis techniques that identify the factors that put a project at risk and to quantify the likely effect of risk on project timescales;
- identify the resources required for a project and to produce a work plan and resource schedule;
- monitor the progress of a project and to assess the risk of slippage, revising targets or counteract drift;
- Distinguish between the different types of project and follow the stages needed to negotiate an appropriate contract.

#### UNIT I

## **Conventional Software Management:**

The waterfall model, conventional software Management performance.

Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

#### UNIT II

**Improving Software Economics:** Reducing Software product size, improving software processes, improving team effectiveness, improving automation, achieving required quality, peer inspections.

The old way and the new: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

#### UNIT III

**Life cycle phases:** Engineering and production stages, inception, Elaboration, construction, transition phases. Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

#### UNIT IV

**Model based software architectures:** A Management perspective and technical perspective. Work Flows of the process: Software process workflows, Iteration workflows.

## UNIT V

**Checkpoints of the process:** Major mile stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

## UNIT VI

**Project Organizations and Responsibilities:** Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation: Automation Building blocks, The Project Environment.

## TEXT BOOK:

1. Software Project Management, Walker Royce: Pearson Education, 2005.

- 1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
- 2. Software Project Management, Joel Henry, Pearson Education.
- 3. Software Project Management in practice, PankajJalote, Pearson Education.2005.

## Autonomous INFORMATION TECHNOLOGY

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RGM-R-2015

#### (A1232157) O.1 HUMAN COMPUTER INTERACTION (Open Elective) (Common to CSE & IT)

### **OBJECTIVES:**

- ✤ To expose students to the central concepts of Human-Computer Interaction.
- Establish target users, functional requirements, and interface requirements for a given computer application
- Describe and explain user interface design principles, and apply them to designing an interface.
- Develop quick-and-dirty interface designs using rapid prototyping methods.
- Evaluate user interface designs through usability inspection and user models
- Develop user studies and analyze study data to gain information about users, tasks, and interface designs.
- ✤ Choose appropriate HCI methods for specified goals and justify the choice

## **OUTCOMES:**

The Student will be able to:

- ✤ Apply HCI principles and a user-centered approach to interaction design
- ✤ Analyze user needs and requirements
- Design and develop prototypes based on user assessments (needs and requirements), while applying HCI principles and models.
- Apply evaluation and usability testing methods to interactive products to validate design decisions
- Develop pre-design and post-design usability testing techniques on the developed website
- ✤ Assess user needs and requirements
- Categorize, design and develop information in proper architectural structures
- Create interface design prototypes based on a range of design principles and user data, and user assessments
- ✤ Apply prototype principles and a user-centered approach to interaction design

## UNIT I

Introduction: Importance of user Interface – definition, Importance of good design. Benefits of good design. A brief history of Screen design.

## UNIT II

The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics-Principles of user interface.

## UNIT III

Design process – Understanding Human interaction with computers, Importance of human characteristics in design, Human consideration in Design, Human interaction speeds.

## UNIT IV

Screen Designing: Human Considerations in Screen Design – Interface Design Goals, Screen Meaning and purpose, organizing screen elements clearly and Meaningfully, Ordering of screen data and content – Screen navigation and flow – Visually pleasing composition – Amount of information – Focus and Emphasis – Presenting information
# Autonomous

# **INFORMATION TECHNOLOGY**

simply and meaningfully – statistical graphics – Technological consideration in interface design.

## UNIT V

Windows: Select the Proper Kinds of Windows: Window Characteristics, Components of a Window, Window Presentation Styles, Types of Windows, Window Management, Window Operations. Select the Proper Device-Based Controls: Characteristics of Device-Based Controls, Selecting the Proper Device Based Controls.

# UNIT VI

Components: Choose the Proper Screen-Based Controls – Operable Controls, Text Entry, Selection Controls, Combination Entry/selection controls, Other Operable Controls, Custom Controls, and Presentation Controls. Write Clear Text and Messages – Words, Sentences, Messages and Text, Text for Web Pages. Icons, Multimedia, Color-What Is It? Color Uses, possible problems with colors, choosing colors.

# TEXT BOOKS:

1. The essential guide to user interface design, Wilbert O Galitz, Wiley India.

# **REFERENCES:**

- 1. Human Computer Interaction. ALAN DIX, JANET FINCAY, GRE GORYD, ABOWD, RUSSELL BEALG, PEARSON.
- 2. Interaction Design PRECE, ROGERS, SHARPS. Wiley Dreamtech,
- 3. User Interface Design, Soren Lauesen, Pearson Education.

# Autonomous INFORMATION TECHNOLOGY

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Т	С
3+1*	3

RGM-R-2015

# (A1233157) O.2 E - COMMERCE (Open Elective) (Common to CSE & IT)

**OBJECTIVES:** 

- Have a general understanding of the Internet and related technologies
- Understanding of policy issues related to privacy, content selection, intellectual property rights, and establishing identity that are germane to electronic commerce.
- Capability to analyze the impact that electronic commerce is having and will likely have on key sectors of the economy and assess the strategic implications this analysis holds for an organization.
- ✤ Be able to analyze the organizational fit between strategy and technology
- Recognize and understand ways of using electronic commerce technologies to improve intra and inter-organizational processes.

• Be able to specify the development of electronic commerce capabilities in a company

### **OUTCOMES:**

- Identify the organizational requirements of eCommerce systems on data protection;
- Demonstrate knowledge of the factors which have impacts upon the security of eCommerce systems;
- ✤ Make realistic assessment on the security of eCommerce systems;
- Design and analyze security measures to protect organizational data against various attacks;
- Describe relevant regulations governing electronic transactions, data privacy protection, and web access.

### UNIT I

Electronic Commerce:-Frame work, Anatomy of E-Commerce applications, E-Commerce Consumer Applications, E-Commerce Organization Applications, Consumer Oriented Electronic Commerce: - Consumer Oriented Applications, Mercantile Process models.

### UNIT II

Electronic Payment Systems: - Types of Electronic Payment System, Digital Token-Based, Smart Cards, Credit Cards, Risks and Electronic Payment Systems.

### UNIT III

Inter Organizational Commerce and EDI:- Electronic Data Interchange, EDI in Application Business, EDI: Legal, Security and Privacy Issues, EDI and Electronic Commerce.

EDI Implementation, MIME and Value Added Networks:- Standardization and EDI, EDI Software Implementation, EDI Envelope for Message Transport, Value added networks, Internet Based EDI.

### UNIT IV

Corporate Digital Library – Dimensions of Internal EC Systems, Making a Business Case for a Document Library, Types of Digital Document, Issues behind Document Infrastructure, Corporate Data Warehouses. Advertising and Marketing - Information Based Marketing, Advertising on Internet, On-line Marketing Process, Market Research.

### UNIT V

Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering.

# UNIT VI

Multimedia - Key Multimedia Concepts, Digital Video and Electronic Commerce, Desktop Video Processing's, Desktop Video Conferencing.

# TEXT BOOK:

1. Frontiers of electronic commerce – Kalakata, Whinston, Pearson.

# **REFERENCES:**

- 1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
- 2. E-Commerce, S.Jaiswal Galgotia.

# Autonomous INFORMATION TECHNOLOGY

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Т	С
3+1*	3

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# (A1234157) O.3 CYBER LAWS (Open Elective)

#### **OBJECTIVES:**

- ✤ To recognize the developing trends in Cyberlaw and the legislation impacting cyberspace in the current situation.
- To generate better awareness to battle the latest kinds of cybercrimes impacting all investors in the digital and mobile network.
- To recognize the areas for stakeholders of digital and mobile network where Cyber law needs to be further evolved.
- To work in the direction of creating an international network of cybercrimes. Legal authorities could then be a significant voice in the further expansion of cyber-crimes and cyber law legislations throughout the globe.

#### **OUTCOMES:**

- To understand intellectual property rights & law of trademarks
- ✤ To understand patent law &international patent law
- States intellectual property rights & law of trademarks
- Will be able to identify the infringement of different laws basing on ownership, transfers, duration, registration and searching

#### UNIT-I

History of Information Systems and its Importance, basics, Changing Nature of Information Systems, Need of Distributed Information Systems, Role of Internet and Web Services, Information. System Threats and attacks, Classification of Threats and Assessing Damages Security in Mobile and Wireless Computing- Security Challenges in Mobile Devices, authentication Service Security, Security Implication for organizations, Laptops Security Concepts in Internet and World Wide Web: Brief review of Internet Protocols-TCP/IP, IPV4, IPV6. Functions of various networking components-routers, bridges, switches, hub, gateway and Modulation Techniques

#### UNIT-II

Basic Principles of Information Security, Confidentiality, Integrity Availability and other terms in Information Security, Information Classification and their Roles. 11 Security Threats to ECommerce, Virtual Organization, Business Transactions on Web, E Governance and EDI, Concepts in Electronics payment systems, E Cash, Credit/Debit Cards.

#### UNIT-III

Physical Security- Needs, Disaster and Controls, Basic Tenets of Physical Security and Physical Entry Controls, Access Control- Biometrics, Factors in Biometrics Systems, Benefits, Criteria for selection of biometrics, Design Issues in Biometric Systems, Interoperability Issues, Economic and Social Aspects, Legal Challenges Framework for Information Security, ISO 27001, SEE-CMM, Security Metrics, Information Security Vs Privacy

### UNIT-IV

Model of Cryptographic Systems, Issues in Documents Security, System of Keys, Public Key Cryptography, Digital Signature, Requirement of Digital Signature System, Finger Prints, Firewalls,

### UNIT - V

Design and Implementation Issues, Policies Network Security- Basic Concepts, Dimensions, Perimeter for Network Protection, Network Attacks, Need of Intrusion Monitoring and Detection, Intrusion Detection Virtual Private Networks- Need, Use of Tunneling with VPN, Authentication. Mechanisms, Types of VPNs and their Usage, Security Concerns in VPN

# UNIT-VI

Laws, Investigation and Ethics: Cyber Crime, Information Security and Law, Types & overview ofCyber Crimes, Cyber Law Issues in E-Business Management Overview of Indian IT Act, EthicalIssues in Intellectual property rights, Copy Right, Patents, Data privacy and protection, DomainName, Software piracy, Plagiarism, Issues in ethical hacking.

## TEXT BOOKS:

- 1. Godbole," Information Systems Security", Willey
- 2. Merkov, Breithaupt," Information Security", Pearson Education
- 3. Yadav, "Foundations of Information Technology", New Age, Delhi

# **REFERENCES:**

- 1. Schou, Shoemaker, " Information Assurance for the Enterprise", Tata McGraw Hill
- 2. Sood,"Cyber Laws Simplified", Mc Graw Hill
- 3. Furnell, "Computer Insecurity", Springer
- 4. IT Act 2000

# Autonomous INFORMATION TECHNOLOGY

IV B.Tech, I-Sem (IT)

Т	С
3+1*	3

RGM-R-2015

# (A1235157) O. 4 BIOMETRICS (Open Elective)

#### PURPOSE

The intended purpose of this course is to provide the students with the overview of biometric systems and applications.

#### **INSTRUCTIONAL OBJECTIVES**

- ✤ An introduction to biometrics
- Biometrics technologies
- ✤ Biometrics for network security
- Uses of biometrics

#### **OBJECTIVES:**

- To familiarize students with the recent developments, encompassing new discoveries in the areas of information representation, image processing, database system design, surface modelling and visualization.
- Traditional and emerging technologies for fingerprint matching, face reconstruction, emotion animation, iris synthesis, voice recognition, thermo gram-based biometrics, and fusion methods will be studies in the course.
- The objective in offering this course is to study advanced algorithms in the area of applied sciences, computer graphics and biometric technologies.

#### **OUTCOMES:**

- The course introduces theoretical bases for studying biometrics, with particular focus on algorithmic foundations, computer graphics techniques, topological properties of the biometric data, information representation, data storage and data search, comparison and matching.
- Impact of these developments on the society, privacy and ethics will also be considered.
- The methods and techniques learned in the course will be illustrated on the examples of solving verification, identification, and synthesis problems for a variety of biometrics.
- Biometrics such as fingerprint, face, eye, ear, palm, gait, voice, signature and others will be discussed.

#### UNIT – I

**INTRODUCTION:** Introduction to biometrics – types of biometrics- key elements of biometrics system- issues involving in Biometrics-benefits of biometric system.

#### UNIT –II

**BIOMETRICS TECHNOLOGIES:** Finger biometric technologies- face biometric technologies- voice biometric technologies- iris biometric technologies.

#### UNIT –III

**BIOMETRICS FOR NETWORK SECURITY:** Implementing biometrics for network securitythe choice of a biometric for network access- biometrics and privacy.

#### UNIT –IV

**STANDARDS IN BIOMETRIC SYSTEM DESIGN:** Assessing the privacy risks in biometricsdesigning privacy-sympathetic

#### $\mathbf{UNIT} - \mathbf{V}$

biometric systems- biometric standards

## UNIT –V

**USE OF BIOMETRICS:** Categorizing biometric applications- customer - facting applications- biometric vertical markets- the future of biometric authentication

# TEXT BOOK

1. Samir Nanavati, Micheal Thieme, Raj Nanavati, *Biometrics – Identity Verification in a Networked World*, Wiley, 2002, ISBN: 81- 265- 0273 – 8.

# **REFERENCE: BOOKS**

- 1. Paul Reid, *Biometrics for network security*, Pearson education, 2004, ISBN 81-297-0528-1
- 2. John D. Woodward, Jr, Nicholas M.Orlans, Peter T.Higgins, *Biometrics the ultimate reference*, Dream Techpress, 2003

IV B.Tech, I-Sem (IT)

T C 1+2\* 1

# (A1236157) GROUP DISCUSSION AND MOCK INTERVIEW (GDMI) [Skill Development Course]

# UNIT-I

**Group Discussion:** Introduction-Types of GD-D topics-Do's and Don't's in GD -GD Tips-Difference between GD and Debate-Mock GD's and Debate - Role Play in a Group Discussion

### UNIT-II

**Presentation Skills:** Presentation Evaluation-Just a minute speeches-Creating a power point presentation-Body language-Conclusions-Planning a meeting-Analyzing a meeting-Analyzing agendas-Round table discussions-Small group presentation-Shaking hands-Logging silences-Talent search-To speak or not to speak-relationships.

#### UNIT-III

**Team Work Skills:** Dimensions of team building-Components of team building-Purpose of teams-Building blocks for team-Types of team-Team leader skills.

#### UNIT-IV

**Interview Skills:** Introduction – concept – Types of Interviews – Characteristics of Interviewer – Characteristics of Interviewee – Recruitment interview – Appraisal interview – Research interview.

# UNIT – V

**Extempore:** Introduction To Extempore - Common Exptempore Topics – SWOT Analysis

#### $\mathbf{UNIT} - \mathbf{VI}$

**Motivational Themes**: How to win Friends and influence people by Dale Carnegie, The Go-Giver: A little story about a powerful Business idea by Bob Burg and John David Mann, How to talk to anyone – 92 little tricks for big success in relationship by Leil Lowndes.

## **REFERENCE BOOKS:**

- 1. How to win Friends and influence people by Dale Carnegie.
- 2. The Go-Giver: A little story about a powerful Business idea by Bob Burg and John David Mann
- 3. How to talk to anyone 92 little tricks for big success in relationship by Leil Lowndes.

# Autonomous INFORMATION TECHNOLOGY

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P C 3 2

**RGM-R-2015** 

# (A1284157) CLOUD COMPUTING LAB

#### **OBJECTIVES**:

- ✤ To learn how to use Cloud Services.
- To implement Virtualization.
- To demonstrate different languages
- ✤ To implement Hadoop system
- ✤ To deploy the application on the cloud

### **OUTCOMES:**

- Analyze the use of Cloud Applications
- Implement applications and finding use of them in cloud.
- ✤ Create virtual machines from available physical resources.

### **EXPERIMENTS:**

- 1. Working of Goggle Drive to make spread sheet and notes.
- 2. Work on Google Docs, sheets and slides
- 3. Installation and configuration of VMW are software and creating virtual environment
- 4. Installation and Configuration of Just cloud and work on Just cloud
- 5. Working in Cloud9 to demonstrate different language
- 6. Working in Codenvy to demonstrate Provisioning and Scaling of a website
- 7. Installation and Configuration of Hadoop/Eucalyptus.
- 8. Work on Hadoop:
  - Start the local hadoop cluster
  - Setup Hadoop Location in Eclipse
  - Upload data to HDFS
  - Create and run Hadoop project
- 9. Working and installation of Google App Engine
- 10. Working and installation of Microsoft Azure
- 11. Working with Mangrasoft Aneka Software
- 12. Run an applications in virtual machine using Aneka Software

### **TEXT BOOKS:**

1. Arshdeep Bahga, Vijay Madisetti , Cloud Computing: A Hands-On Approach, Create Space Independent Publishing Platform 2013

IV B.Tech, I-Sem (IT)

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3	2

# (A1285157) INFORMATION SECURITY & MOBILE COMPUTING LAB OBJECTIVES:

- To learn about the concepts and principles of mobile computing;
- ✤ To explore both theoretical and practical issues of mobile computing;
- To develop skills of finding solutions and building software for mobile computing applications.

# **OUTCOMES:**

- How you select appropriate techniques to tackle and solve problems in the discipline of information security management;
- ✤ Why security and its management are important for any modern organisation;
- How an information security management system should be planned, documented, implemented and improved, according to the BSi standard on information security management.
- 1. Write a program to encrypt and decrypt a given text using Ceaser Cipher algorithm
- 2. Write a program to implement the transposition using Rail fence technique
- 3. Write a program to implement mono alphabetic cipher
- 4. Write a program to implement a play fair cipher
- 5. Write a program to implement a symmetric encryption algorithm: SDES
- 6. Write a program to implement asymmetric encryption algorithm: RSA
- 7. To implement Code Division Multiple Access (CDMA)
- 8. To check orthogonal of two codes & Generation of Walsh codes
- 9. To create MIDlet suite with two MIDlets
- 10. Write WML program for
  - a) To accept username and password
  - b) To print the data in table
  - c) To insert a WBMP (image file) in WML file
  - d) To use option & select tags with variable
- 11. Write WML program for
  - a) Example of OnPick Event
  - b) Example of How to use anchor tag
  - c) Example of hyperlink
  - d) To accept information from user (Input tag)
- 12. Write WML program for
  - a) Multiple cards in a single WML file (DECK)
  - b) OPTGROUP tag
  - c) To design a simple WML car
  - d) tag in WML
  - e) <do type> tag

# Autonomous INFORMATION TECHNOLOGY

IV B.Tech, I Sem (IT)

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3	2

RGM-R-2015

# (A1286157) MINI PROJECT

### **OBJECTIVES:**

- The capacity to observe astutely and propose and defend opinions and ideas with tact and conviction is the invaluable learning outcome.
- Not a mere recipient of ideas, the student is a participant in discovery and inquiry.
- To learn application oriented knowledge in multi-dimensional way of subjects learned.

## **OUTCOMES:**

- Distinguish the multiple senses of a subjects (literal and beyond the literal).
- Identify and understand assumptions, theses, and arguments that if exist in the work of authors.
- Evaluate and synthesize evidence in order to draw conclusions consistent with the subject. Seek and identify confirming and opposing evidence relevant to original and existing theses.

There shall be mini-Project, in collaboration with an industry (wherever possible) of their specialization, to be taken up during the vacation(data collection, components etc) after III year II Semester examination and implementation/simulation shall be carried out in IV first semester during lab classes. Implementation or construction of mini project will be treated as laboratory. However, the mini project and its report shall be evaluated in IV year I Semester. The mini project shall be submitted in report form and should be presented before the committee, which shall be evaluated for 50 marks. The committee consists of an external Examiner, Head of the Department, the supervisor of mini project and a senior faculty member of the Department. There shall be 25 Internal marks for mini project which will be awarded based on the performance and involvement of the student during mini project period.

### **Evaluation:**

Mini Project -	50	End Examination (External evaluation)	This End Examination in mini project will be for a maximum of 50 marks.
	25	Internal evaluation	Day-to-day performance in executing mini project.

# Autonomous INFORMATION TECHNOLOGY

IV B.Tech, II-Sem (IT)

T C 3+1\* 3

**RGM-R-2015** 

# (A0017157) MANAGEMENT SCIENCE (Common to EEE, CSE & IT)

### **OBJECTIVE:**

Businesses are capturing data at an unprecedented rate with every transaction, customer interaction, website visit, blog, to name a few sources. They need are business insights as to which business decisions will optimize business performance. The objective of this course is to introduce the student to quantitative modeling tools to support business decision making, specifically to two important groups of quantitative methods for predictive and prescriptive business analytics: optimization and data mining to support business decision making. The emphasis is less on the theoretical aspects of specific methods, but more on the application of these methods for supporting business decisions.

#### **OUTCOMES:**

The student will be able to:

- Know where optimization, decision analysis, clustering, classification, regression and market basket analysis can be used to create business value
- Formulate and implement simple linear and integer programming models in Excel and interpret the results including sensitivity analysis
- Construct a decision tree to analyse business decisions under uncertainty and interpret the results including sensitivity analysis
- Have developed spread sheet modelling skills

#### UNIT I

**The meaning and role of Management Information System:** What is a management information system, what is the systems approach, the systems view of business, MIS organization within the company.

**Management, Organizational theory and the systems approach:** Development of the organizational theory, management and organizational behaviour, management, information, and the systems approach.

#### UNIT II

**Information systems for decision making:** Evaluation of an information system, basic information system, decision making, and MIS, MIS as a technique for making programmed decisions.

**Strategic and Project Planning for MIS:** general business planning appropriate MIS response, MIS planning: General, MIS planning: Details.

#### UNIT III

**Conceptual systems design:** Define the problems, set system objectives, establish system constraints, determine information needs, determine information sources, develop alternative conceptual designs and select one, document the system concepts, prepare the conceptual design report.

#### UNIT IV

**Detailed system design:** Inform and involve in the organization, aim of detailed design, project management of MIS detailed design, identify dominant and trade off criteria, define the subsystems, sketch the detailed operating sus systems and information flows, determine the degree of automation of ech operation , inform and involve the organization again, inputs, outputs, and processing, early system testing, software, hardware, and tools,

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propose an organization to operating the system, document the detailed design, Revisit the manager-user.

#### UNIT V

**Implementation, Evaluation, and maintenance of the MIS:** Plan the implementation, acquire floor space and plan space layouts, organize for the implementation, develop procedures for implementation , train the operating personal, computer related acquisitions, develop forms for data collection and information dissemination, develop the files, test the system, cutover, document the system, evaluate the MIS, control and maintain the system.

**Pitfalls in MIS development:** fundamental weaknesses, soft spots in planning, design problems, Implementation: The Tar Pit.

#### UNIT VI

**Systems concepts & control:** Systems classifications, some system concepts, control: The key system concept, the business organization as a system, control and system design.

**Management Science and Systems modeling for MIS:** what is management science, what are models, kinds of models, use of models, for analysis of systems characteristics, simulation, construction of models.

#### **TEXT BOOKS:**

1. Information systems for modern management-Robert G. Murdick, Joel E.Ross, James R. Claggett.

#### **REFERENCE BOOKS:**

- 1. Management Information systems -the managers view-Robert schultheis, mary sumner, Tata McGraw-Hill Edition.
- 2. Management Information systems-Gerald V. Post, David L.Anderson.

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#### (A1237158) G4.1 INFORMATION RETRIEVAL SYSTEMS (Elective-4)

## **OBJECTIVES:**

This course covers principles of information retrieval and their application to information systems and services. Emphasis is on models of user information seeking behaviour, human information processing, and their relationship to retrieval models in information systems.

## **OUTCOMES:**

The student will be able to:

- Design, query, and evaluate a database information retrieval system, using an appropriate user model;
- Articulate the fundamental concepts of information retrieval and informationseeking behaviour, and employ them in the design and evaluation of systems;
- Understand the problems inherent in the representation of information in a retrieval system, and be aware of the dominant models used in information retrieval,
- Understand principles of good interface design and be able to evaluate interfaces using those principles.

#### UNIT I

**Introduction & Information Retrieval System Capabilities:** Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses. Search, Browse, Miscellaneous

### UNIT II

**Cataloging and Indexing:** Objectives, Indexing Process, Automatic Indexing, Information Extraction.

**Data Structures:** Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

### UNIT III

**Automatic Indexing:** Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages

#### UNIT IV

**Document and Term Clustering:** Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

#### UNIT V

**User Search Techniques:** Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, Weighted searches of Boolean systems, Searching the Internet and hypertext. Information Visualization: Introduction, Cognition and perception, Information visualization technologies.

#### UNIT VI

**Text Search Algorithms:** Introduction, Software text search algorithms, Hardware text search systems. Measures used in system evaluation, Measurement example – TREC results.

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# TEXT BOOK:

1. Kowalski, Gerald, Mark T Maybury: Information Retrieval Systems: Theory and Implementation, Kluwer Academic Press, 1997.

#### **REFERENCE BOOKS:**

- 1. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and algorithms, Prentice Hall, 1992.
- 2. Modern Information RetrievalBy Yates Pearson Education.
- 3. Information Storage & RetrievalBy Robert Korfhage John Wiley & Sons.

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#### (A0515158) G4.2 BACKUP RECOVERY SYSTEMS AND ARCHITECTURE (Elective-4) (Common to CSE & IT)

### **OBJECTIVES:**

To provide students with a solid foundation in Backup and Recovery infrastructure. The course focuses on the concepts and technologies used in Backup and Recovery environments.

Students will learn about

- Backup and recovery theory, including backup methods, planning and key terminology,
- How storage technologies work and how their features such as replication and snapshots can be used for backup.
- Data sources at the backup client and storage node backup targets.

### **OUTCOMES:**

After completing the course students will be able to:

- Define key backup and recovery terminology.
- Describe backup and recovery operations.
- Identify and differentiate various types of storage systems.
- ✤ Identify SAN and NAS concepts and components.
- Describe storage system features used in backup and recovery.
- Describe the different types of backup storage media, their advantages and disadvantages.
- Examine the steps involved in planning for backup and recovery.
- Describe the EMC portfolio of backup products.
- Identify major sources of backup data.

### UNIT I

**Backup Theory:** Introduction to backup and recovery, including the reasons for performing backups, definition of common backup and recovery terms, and a look at the flow of data in typical client/server backup and restore operations. Backup and Recovery overview, Backup/ Recovery Methods and Operations.

### UNIT II

**Information Storage Concepts:** Disk architecture and storage systems: Introduction to Storage Systems, Protecting Disks in Arrays, Intelligent Storage Systems, Direct-Attached Storage, SCSI Architecture, Storage Area Networks (SAN), Network-Attached Storage (NAS), Protecting Data in External Storage, Continuous Data Protection. Storage system features used in backup and recovery operations.

### UNIT III

**Backup Client:** Various sources of backup data including file system data and several types of databases, including Oracle, Microsoft SQL, Exchange, Protecting Data in File Systems vs. Applications, Microsoft Volume Shadow Copy Service, File Servers, Virtualization, Client and Remote Office Backups, Backup Considerations and Challenges.

### UNIT IV

**Backup Storage Node:** Backup and recovery from the perspective of the storage node, including the various protocols used when writing data and the advantages and disadvantages of the various types of backup storage media Storage Node Components,

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Protocols, Backup to Physical Tape, Backup to Disk, Backup to Virtual Tape, Deduplication Systems, Cloud Storage.

### UNIT V

**Backup and Recovery Planning:** Various factors to be considered in backup and recovery planning, Management and Testing, Disaster Recovery Considerations.

### UNIT VI

**Application:** Use the concepts learned in the course to develop a proposed solution that addresses the backup and recovery concerns of a sample company's backup and recovery concerns.

### **REFERENCE BOOKS:-**

- 1) **Pro Data Backup and Recovery** Author: Steven Nelson, Publisher: Apress (2011), ISBN: 9788132205876
- 2) **Disaster Recovery & Business Continuity**: Author: thejendrabs, Publisher: Shroff/iT Governance Publishing ISBN:- 9788184043310

# **PREREQUISITES:**

Students who have completed courses on the following topics will have an added advantage in comprehending the content of the course:

- 1. Computer systems and architectures
- 2. Networking technologies
- 3. Operating systems
- 4. Information storage and management.

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# (A1239158) G4.3 SOFT COMPUTING (Elective-4) (Common to CSE & IT)

#### **OBJECTIVES:**

Soft computing covers non-traditional technologies or approaches for solving hard real-world problems. Content of course, in accordance with meaning of its name, is as follow: Tolerance of imprecision and uncertainty as the main attributes of soft computing theories. Neural networks. Fuzzy logic.

#### **OUTCOMES:**

The student will be able to acquire knowledge of soft computing theories fundamentals and so they will be able to design program systems using approaches of these theories for solving various real-world problems.

#### UNIT I

**Introduction to Intelligent Systems and Soft Computing:** Introduction, Intelligent systems, Knowledge-based systems, Knowledge representation and processing, Soft computing

#### UNIT II

**Fundamentals of Fuzzy Logic Systems & Fuzzy Logic Control:** Fuzzy sets, Fuzzy logic operations, Generalized fuzzy logic operations, Implication (if-then), Some definitions, Fuzziness and fuzzy solutions, Fuzzy relations, Composition and inference, Considerations of fuzzy decision-making. Basics of fuzzy control, Fuzzy control architectures.

#### UNIT III

**Fundamentals of artificial neural networks:** Learning and acquisition of knowledge, Features of artificial neural networks, fundamentals of connectionist modeling.

#### UNIT IV

**Neuro-fuzzy Systems:** Architecture of neuro-fuzzy systems, Construction of neuro-fuzzy systems

#### UNIT V

**Evolution Computing:** Overview of evolution computing, Genetic algorithms and Optimization, The schema theorem: the fundamental theorem of genetic algorithms, Genetic algorithm operators, Integration of genetic algorithms with neural networks, Integration of genetic algorithms with fuzzy logic, Known issues of GAs.

#### UNIT VI

Applications from PR, IP, IRS, Share Market Analysis, Soft Computing forCalorRecipe Prediction case studies.

#### **TEXT BOOK:**

1. Soft computing and intelligent systems design, by Fakhreddine O. Karray and Clarence De Silva, Pearson Education, 2009

#### **REFERENCE BOOK:**

1. Neuro-Fuzzy and Soft Computing, J.S.R Jan, C.-T. Sun and E. Mizutani, PHI, 2005

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# (A1240158) G 4.4 PRINCIPLES OF COMPILER DESIGN (Elective-4)

## **OBJECTIVE:**

The goal of the course is to provide an introduction to the system software like assemblers, compilers, and macros. It provides the complete description about inner working of a compiler. The main focus is on the design of compilers and optimization techniques. It also focuses on the design of Compiler writing tools. The course also aims to convey the language specifications, use of regular expressions and context free grammars behind the design of compiler.

#### **OUTCOME:**

The student will be able to have an understanding, based on knowledge of the underlying machine architecture, the limitations and efficiency of various design techniques of compilers implementation. Students will also be exposed to understand different parsers, optimization etc., It also covers programming in various tools like LEX and YACC for scanning and parsing etc.

#### UNIT I

**Introduction to compilers:** Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens. **Unit II** 

**Syntax Analysis:** Role of the parser –Writing Grammars –Context-Free Grammars – Top Down parsing – Recursive Descent Parsing – Predictive Parsing – Bottom-up parsing – Shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser – Canonical LR Parser – LALR Parser.

### UNIT III

**Intermediate Code Generation:** Intermediate languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – Procedure calls.

### UNIT IV

**Type Checking and Runtime Environments:** Syntax directed definitions – Construction of syntax trees – Type systems – Specification of a simple type checker - Equivalence of type expressions – Type conversions – Attribute grammar for a simple type checking system – Runtime Environments: Source language issues – Storage organization – Storage allocation strategies – Parameter passing.

#### UNIT V

**Code generation:** Issues in the design of a code generator – The target machine – Runtime storage management – Basic blocks and flow graphs – Next-use information – A simple code generator – Register allocation and assignment – The DAG representation of basic blocks – Generating code from DAG – Dynamic programming code generation algorithm – Code-generator generators.

#### UNIT VI

**Code optimization:** Principal sources of optimization – Peephole optimization – Optimization of basic blocks – Loops in flow graphs – Introduction to global data flow analysis – Iterative solution of data flow equations – Code improving transformations – Dealing with aliases.

## TEXT BOOKS

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman. "Compilers Principles, Techniques and Tools". Pearson Education

# **REFERENCE BOOKS:**

- 1. Steven S. Muchnick, "Advanced Compiler Design Implementation", Morgan Koffman, 1997.
- 2. Charles N. Fischer, Richard J. Leblanc, "Crafting a Compiler with C", Benjamin Cummings, 1991.
- 3. Allen Holub, "Compiler Design in C", Prentice Hall of India, 1990.

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#### (A1241158) G5.1 DATA SCIENCE AND BIG DATA ANALYTICS (Elective-5/MOOC)

## **OBJECTIVES:**

To provide:

- ✤ A practical foundation level training that enables immediate and effective participation in big data and other analytics projects.
- ✤ A baseline of skills that can be further enhanced with additional training and realworld experience.
- ✤ An introduction to big data and a Data Analytics Lifecycle Process to address business challenges that leverage big data.
- ✤ A grounding in basic and advanced analytic methods and an introduction to big data analytics technology and tools, including Map Reduce and Hadoop.
- Practical opportunities to apply these methods and tools to real-world business challenges and includes.

#### **OUTCOMES:**

- Learns relation between data mining, data science and big data.
- Learns the "technologies", i.e., the tools/algorithms that are available for a variety of "analytics".
- Students will possess the skills necessary for utilizing tools (including deploying them on Hadoop/MapReduce) to handle a variety of big data analytics, and to be able to apply the analytics techniques on a variety of applications.

## UNIT I

**Introduction to Big Data Analytics:** Big Data overview, state of the practice of Analytics, Big Data Analytics in industry verticals. Overview of Data Analytics lifecycle, discovery, data preparation, model planning, model building, communicating results and findings, operationalizing.

### UNIT II

**Using R for Initial Analysis of the Data:** Introduction to using RInitial exploration, analysis of the Data using RBasic, data visualization using R. Use of R package as a tool to perform basic data analytics, reporting, and apply basic data visualization techniques to data. Application of basic analytics methods such as distributions, statistical tests and summary operations, and differentiate between results that are statistically sound vs. statistically significant. Identifying a model for data and define the null and alternative hypothesis.

#### UNIT III

Advanced Analytics and Statistical Modeling for Big Data – Theory and Methods: Examining analytic needs and selects an appropriate technique based on business objectives, initial hypotheses, the data's structure and volume. Application of some of the more commonly used methods in Analytics solutions. Algorithms and the technical foundations for the commonly used methods. Environment (use case) in which each technique can provide the most value. Appropriate diagnostic methods to validate the models created.

#### UNIT IV

**Advanced Analytics and Statistical Modeling for Big Data – Technology & Tools:** Various tools to Perform Analytics on unstructured data using MapReduce Programming paradigm. Use Hadoop, HDFS, HIVE, PIG and other products in the Hadoop ecosystem for unstructured data analytics.

# UNIT V

**In-Database Analytics:** Use R and in-database analytical functions to fit score and evaluate models. Effectively use advanced SQL functions and Greenplum extensions for in-database analytics. Use MADlib to solve analytics problems in-database

## UNIT VI

**Endgame - Operationalizing an Analytics Project:** This unit focuses on- Articulate three tasks needed to operationalize an analytics project. Explain how the four common deliverables of an analytics lifecycle project meet the needs of key stakeholders. Use a framework for creating final presentations for sponsors and analysts. Evaluate a data visualization and identify ways to improve it. Apply these concepts to a big data analytics problem in the final lab.

# **REFERENCE BOOKS:-**

- 1) **Analytics in Practice**, Author: Soumendra Mohanty, Publisher: Tata Mcgraw Hill Education (2011), ISBN-13:-9780070707061
- 2) Agile Analytics: A Value-Driven Approach to Business Intelligence and Data Warehousing, Author: Ken W. Collier Publisher: Pearson Education (2012), ISBN-13:- 9788131786826
- 3) **MapReduce Design Patterns**, Author: Donald Miner, Publisher: O'Reilly (2012), ISBN-13:- 9789350239810.

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# (A1242158) G 5.2 FORENSICS AND INCIDENT RESPONSE (Elective-5/MOOC)

# PURPOSE

Any organization with a presence will be the victim of computer incident and learning how to respond to such incidents is critical. The main purpose of this course is to learn the secrets and strategies for recovering from computer crime incidents and to respond to security breaches and hacker attacks.

### **OBJECTIVES:**

To understand

- To plan and prepare for all stages of an investigation detection, initial response and management
- $\bullet$  interaction
- ✤ To investigate web server attacks, DNS attacks and router attacks
- To learn the importance of evidence handling and storage
- To perform "Trap and Trace" and learn network protocols
- ✤ To monitor network traffic and detect illicit servers and covert channels

### **OUTCOMES:**

- To be able to provide computer, cell phone, mobile & email forensic solutions using computer forensic technologies and tools
- Will be able to provide computer, cell phone, mobile & email forensic solutions using computer forensic technologies and tools

## UNIT –I

**INTRODUCTION TO COMPUTER FORENSIC TECHNOLOGY:** Types of CF techniques -Incident and incident response methodology - Forensic duplication and investigation, Network monitoring. Preparation for IR: Preparing individual ports and establishing policies and procedures - Creating response tool kit and IR team.

### UNIT –II

**INVESTIGATIVE GUIDELINES:** Initial assessment –Checklist. Investigating the incident – Formulation of response strategy - The computer forensic process - Handling evidence - Performing forensic duplication and analysis. Network protocols and performing trap, trace.

### UNIT –III

**PERFORMING NETWORK SURVEILLANCE:** Network forensics-Setting up the system-Advanced network surveillance. Attackers goals-ICMP covert channeling - TCP covert channelling - HTTP.

### $\mathbf{UNIT} - \mathbf{IV}$

**CYBERSPACE:** Establishing identity in cyberspace: Investigating IP address-MACaddress-Tracing E-mails-E-mail address-Usernames-Nicknames and host names.

### UNIT – V

**INITIAL RESPONSE TO WIN NT/2000 SYSTEM:** Investigating systems-Windows NT/2000. IR Unix systems and investigating Unix.

### $\mathbf{UNIT} - \mathbf{VI}$

**HACKER TOOLS:** Investigating nonplatform - Specific technology. Routers -Web attacks - Application servers – Investigating hacker tools.

#### TEXT BOOKS

1. Kevin Mandia, Chris Prosise, *Incident Response-Investigating computer crime*, Tata McGraw Hill, 2001.

### **REFERENCE BOOKS**

- 1. Eoghan Casey, Handbook Computer crime Investigation's Forensic tools and technology, Academic Press, 1st Edition, 2001.
- 2. Norbert Zaenglein, *Disk Detective: Secret you must know to recover information from a computer*, Paladin press, 2000.
- 3. John R.Vacca, Micheal Erbschloe, *Computer Forensics*, Charles River Media, Book and CD-ROM edition , 2000.
- 4. Tonny Summers, Brian Jenkinson and A.J.Sammers, *Forensic computing: A Practitioners guide*, Springer Verlag, 1st Edition, 2000.
- 5. Peter Stephenson, Investigating computer crime: A Handbook for corporate investigations, Sept 1999.

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# (A1243158) G 5.3 GAME PROGRAMMING (Elective-5/MOOC)

# PURPOSE:

The main purpose of this course is to provide the student with sound programming skills to learn tile based games, board games and strategy based games. Integrate technologies such as multimedia, artificial intelligence and physics modelling into a cohesive interactive game application.

### **OBJECTIVES:**

- ✤ To understand the evolution of games throughout history and development
- To implement games programming principles and algorithms using industrial strength.
- ✤ To understand all aspects of game technologies and implement 2D and 3D programming using direct draw.

### **OUTCOMES:**

- Will write clear and efficient code in the programming languages relevant to professional game development, following appropriate coding standards and industry practices.
- Build systems that employ common approaches to game AI, game physics, game networking, game graphics (2D and 3D), operating systems, and file formats.
- Solve complex problems by using appropriate mathematical tools including those developed through Algebra, Geometry/Trigonometry, Calculus, Linear Algebra, Discrete Mathematics, and Physics.
- Use appropriate resources to research, develop, and contribute to advances and trends within the field of game development.

### UNIT –I

**INTRODUCTION:** Introduction: History of games, features & requirement of games, the role of game programming in game industry. Game genres: Deterministic games and Non-deterministic games, tile based games, Board games and strategy based games, collective action games, competitive games.

### UNIT –II

**OPTIMIZATION OF GAME PROGRAMMING:** Optimization of game programming: Review of data structure & algorithm, various methods of information, code optimization in games, control in games, user interfaces, keyboard input in games, games platform ( PC/MAC, ARCADE, Console in games, OS )

### UNIT –III

**STRATEGY IN GAMES & GAME THEORY:** Strategy in games & game theory: Basic strategic & principles, fundamentals of games theory, games with simultaneous moves, mixed Strategies, probability & expected utility, search algorithm, path finding algorithm, shortest path algorithm, A\* algorithm, application of Artificial Intelligence in computer games.

### UNIT –IV

**2 D PROGRAMMING:** 2D&3D Programming: Introduction to direct draw, graphic modes available in direct draw, creating 2D using Direct draw,

# UNIT – V

**3 D PROGRAMMING:** creating 3D using Direct Draw, interfacing with 3D graphic cards. Direct-X: Analysis of Direct-X, features of Direct\_X, APIs in the Direct-X, examples of Direct-X, games, details on each library with Direct-X, introduction to Direct input, utilitizing Direct input for Hardware interfacing, introduction to Direct sound.

## UNIT- VI

**ISSUES IN GAME PROGRAMMING:** Issues in game programming: Speed in games, data storage consideration, level design, playability, choice of game implementation, Game appreciation: Difference in games skills, development of skills, appreciation of games, determining the quality of the game, future gaming technologies and style.

## **TEXT BOOKS:-**

- 1. Jonathan S. Harbour "Beginning Game Programming", Wiley publication, 2006.
- 2. Dutta, Prajit K., "Strategies &games: Theory & Practice", MIT Press, 1999.
- 3. Andre La Mothe "2D/3D Game programming" Waite Group Press, 1996.
- 4. Rohan Coelho "DirectX, RDX and MMX Technology", API, 1998.

# **REFERENCE BOOKS:-**

- 1. Todd Barron "Strategy Game Programming" Published by Wordware, 2005.
- 2. Andrew Lamothe "Tricks of the windows Game Programming" SAMS, 2005.

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# (A1244158) G 5.4 GREEN IT (Elective-5/MOOC)

#### **OBJECTIVES:**

- Assess enterprise wide and personal computing and computing related energy consumption.
- ✤ Acquire expertise for improving the energy efficiency of personal computers by reducing the power consumption requirements.
- Choose the best sustainable hardware for their applications.
- ✤ Evaluate the regulatory and governance issues surrounding IT.
- Recognize the necessity for long-term sustainability in IT.
- Formulate plans for reducing IT heating and cooling requirements.
- Execute a virtualization plan

# **OUTCOMES:**

- Students know that how to minimize the power usage and procure sustainable hardware
- ✤ To get the awareness about design green data centers
- ✤ To get the awareness about reducing the number of servers by virtualization

#### UNIT-1

Trends and Reasons to Go Green: Overview and Issues, Current Initiatives and standards, minimizing power usage

#### UNIT-2

Cooling: Cooling costs, Reducing cooling costs, Optimizing air flow, adding cooling, Datacenter Design.

#### UNIT-3

Changing the way we work, Going Paper less, Recycling

# UNIT-4

Hardware considerations: Certification Programs, Energy star, servers, hardware considerations, remote desktops, In practice

#### UNIT-5

The Greening Process-1: Data center design and redesign: energy consumption , design, Upgrading to energy-efficient servers, server consolidation, Cabling considerations

#### UNIT-6

The Greening Process-2:

Server Virtualization, Server Virtualization solutions, Implementation, Storage Virtualization, Virtualization Types, storage virtualization solutions, Greening your information systems

### **TEXT BOOKS:**

1. Green IT, Toby J. Velte, Anthony T. Velte, Robert Elsenpeter, 2008, McGraw Hill

#### **REFERENCES:**

- 1. Green IT for dummies, David Tebbutt, Martin Atherton, Tony lock, HP Limited Edition
- 2. The Greening of IT-How companies can make a difference for the environment, John Lamp, 2009, IBM Press
- 3. Foundations of Green IT, Marty Poniatowski , 2009, Prentice Hall

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# (A1238158) DATA ANALYSIS AND VISUALIZATION [Skill Development Course]

#### **OBJECTIVES:**

- It describes some of the key concepts and methods of data analysis and how they can be implemented in MATLAB.
- Exploratory data analysis is an area of statistics and data analysis.
- The idea is to first explore the data set, often using methods from descriptive statistics, scientific visualization.

#### **OUTCOMES:**

After this course Students are familiar with the following

- ✤ Data, data analysis.
- Dimensionality reduction.
- Data Clusters, Visualization clusters.
- Distribution Shapes (Histograms, Boxplots, Quantile Plots, Bag Plots, Glyph Plots).

#### UNIT-1

**Introduction to MATLAB:** What is MATLAB, File and Workspace Management, Punctuation in MATLAB, Arithmetic Operations, Data Constructions in MATLAB, Script Files and Functions, Control Flow, Simple Plotting.

**Introduction to Exploratory Data Analysis:** Overview Of The Text, A Few Words About Notation, Dat Sets Used in the Book, Transforming Data.

#### UNIT-2

**Dimensionality Reduction-Linear Methods:** Introduction, Principal Component Analysis-PCA, Singular Value Decomposition-SVD, Factor Analysis, Intrinsic Dimensionality.

**Dimensionality Reduction-Nonlinear Methods:** Multidimensional Scaling-MDS, Manifold Learning, Artificial Neural Network Approaches.

#### UNIT-3

**Finding Clusters:** Introduction, Hierarchical Methods, Optimization Methods, Evaluating the Clusters.

**Model Based Clustering:** Overview of Model-Based Clustering, Finite Mixtures, Expectation-Minimization Algorithm, Hierarchical Agglomerative Model Based Clustering, Model-Based Clustering, Generating Random Numbers from a Mixture Model.

#### UNIT-4

**Smoothing Scatterplots:** Introduction, Loess, Robust Loess, Residuals Diagnostics, Bivariate Distribution Smooths, Curve Fitting Toolbox.

Visualizing Clusters: Dendrogram, Treemaps, Rectangle Plots, ReClus Plots, Data Image.

#### UNIT-5

Distribution Shapes: Histograms, Boxplots, Quantile Plots, Bagplots.

#### UNIT-6

**Multivariate Visualization:** Glyph Plots, Scatterplots, Dynamic Graphics, Coplots, Dot Charts, Plotting Points as Curves, Data Tours Revisited.

#### **TEXTBOOK:**

1. Exploratory Data Analysis with MATLAB, Wendy L.Martin, Angle R.Martin, Jeffey L. Sol, CRC Press.

#### **REFERENCE BOOKS:**

- 1. MATLAB Programming for Enginners, Stephen J.Chapman, Third Edition, THOMSON LEARNING.
- 2. Mastering MATLAB, Duane Hanselman, Bruce Littlefield, PEARSON Education.
- 3. Applied Numerical Methods with MATLAB for engineers and Scientists, STEVEN C. CHAPRA McGRAW-HILL INTERNATIONAL EDITION.