KandulaSrinivasa Reddy Memorial College of Engineering (Autonomous)
Kadapa 516003 AP

(Affiliated to JNTUA, Anantapur, Accredited By NBA, Accredited By NAAC) (An ISO 9001-2000 Certified Institute)

Regulationsfor UG Programs in Engineering (R15UG)

(Effective from 2015-16)

KSRM College of Engineering (Autonomuos), Kadapa-516003, AP

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1.0 Nomenclature

1.1 *Academic Year*: Period of academic instruction of, approximately, one year duration that usually starts in June/July and ends in April/May next

1.2 *Semester*: Either of two divisions of an academic year

1.3 *Major*: A specific fieldof study. Example: Civil Engineering

1.4 *Minor*: An area outside of, or complementary to, a Major. Example: For Civil Engineering major, Computer Science is a minor and vice versa

1.5 *Subject*: An area of knowledge that is studied as part of a Course

1.6 *Core*: A subject that is mandatory for a Major course of study

1.7 *Elective*: A subject that is selected for study to suit one's individual needs

1.8 *Audit Subject*: A subject that is studied to meet certain requirements but has no credits assigned to it

1.9 *Self-Study Subject*: A subject that is learnt by a student on own under the guidance of a Faculty member

1.10 *Humanities*: Subjects that describe and interpret human achievements, problems and historical changes at individual and societal levels covering the disciplines of literature, history, and philosophy

1.11 *Social Sciences*: Subjects that describe the mental and behavioural activities of individuals, groups, organizations, institutions, and nations covering the disciplines of anthropology, economics, linguistics, political science, and psychology

1.12 *Exam*: A test to measure one's progress, knowledge, or ability in a subject

1.13 *Credit*: A numerical weight given to a subject

1.14 *Grade*: A numerical or alphabetic designation measuring the level of achievement in an exam

1.15 *Attendance*: Physical presence of oneself in a classroom/laboratory for purpose of a scheduled academic instruction

1.16 *Course*: A series of subjects that constitute a Major field of study

1.17 *Branch*: Same as Course

1.18 *Program*: Same as Course

1.19 *Degree*: An academic title conferred to honour distinguished achievement

2.0 Short Title and Application

2.1 These rules and regulations may be called as R15UG and come into force from Academic Year 2015-16 and exist until superseded by new regulations. These rules are applicable for students who join the institute from academic year 2015-16 onwards. Students who have joined in earlier regulations will continue in their respective regulations

2.2 These rules and regulations are applicable to all under graduate courses in engineering and technology leading to Bachelor's Degree in Technology (B. Tech)

2.3 The Majorcourses offered, at present, are:

2.3.1 Civil Engineering

2.3.2 Electrical and Electronics Engineering

2.3.3 Mechanical Engineering

2.3.4 Electronics and Communications Engineering

2.3.5 Computer Science and Engineering

2.4 The Institute may offer new Majors in future to which these rules and regulations will be applicable

3.0 Suspension and Amendment of Rules

3.1 Academic Council has the authority to suspend a rule temporarily

3.2 Academic Council has the authority to amend a rule

3.3 For affirmative action on any suspension or amendment of a rule, an affirmative vote of three-fifths of the members present and voting shall be required in Academic Council

4.0 Requirements for Admission

4.1 At present, admissions into first-year class of various Majors are governed by Government and the Affiliating University. The eligibility criteria and procedure for admission are prescribed by Government and Affiliating University

4.2 A student is not allowed change of Major after admission into first-year

4.3 A student must fulfil medical standards required for admission

4.4 The selected students are admitted into first-year class after payment of the prescribed fees

5.0 Structure of the B. Tech course

5.1 Duration: The duration of B. Tech degree course is eight semesters spread over four academic years. Semesters are named sequentially from First Semester to Eighth Semester

5.2 Working Days: Calendar for any semester shall be announced at least four weeks before its commencement. Minimum number of working days are 90 for a semester

5.3 Curriculum: Each Major shall havecore, elective and audit subjects drawn from five categories of subject areas - i) Basic Sciences (BS), ii) Humanities

and Social Sciences (HS), iii) Basic Engineering and Design (ED), iv) Professional Major (PJ), and v) Professional Minor (PN). The curriculum for each Major shall be approved by its corresponding Board of Studies and then by the Academic Council

5.4 Credits: All subjects that are assessed for marks have credits assigned to them. The credits assigned to subjects shall be given in curriculum. The total number of credits for entire course is 180 forallMajors. The distribution of total credits semester-wise is given in Table 1

Table 1Semester-wise Total Credits

Semester	Total Credits
First Semester	22
Second Semester	22
Third Semester	22
Fourth Semester	22
Fifth Semester	22
Sixth Semester	22
Seventh Semester	22
Eighth Semester	26
Total for entire course	180

5.5 The curriculum and syllabus for first and second semesters is given in Annexure-1 and Annexure-2 respectively

5.6 Responsibility and Advising: It is the responsibility of the student to understand and know the regulations and requirements to earn the degree. Each student admitted in to the degree programs is assigned to a Faculty Advisor who assists the student in designing an effective program of study. Students should consult their Faculty Advisors for selection of electives and for general advice on academic program

6.0 Registration and Enrolment

6.1 Prior to start of each semester, every student shall register for all the credit-bearing and audit subjects listed in curriculum of the semester. Excepting first semester, the registration for asemestershall be done during a specified week after end examinations of previous semester. In first semester, the registration shall be done within six working days from date of joining. Recommendation of Faculty Advisor is needed for registration

6.2 A student can also register optionally for one self-study subject per semester that does not carry any credits. A student can take any subject of any Major as self-study subject, satisfying the prerequisites if any, on the recommendation of concerned Faculty Advisor

6.3 Late registration will be permitted with a fine, decided from time to time, up to six working days from the last date specified for registration

6.4 A student will be eligible for registration for a semester if she or he i) is promoted to that semester, ii) has cleared all fees to the Institute, library and hostel of previous semester, and iii) is not disqualified for registration by a disciplinary action of the Institute

6.5 A student will be enrolled and allowed to attend the classes on successful registration and payment of necessary fees to Institution, library, and hostel

6.6 Registration and enrolment will be controlled by the Office of the Controller of Examinations

7.0 Assessment Procedure – Internal Tests and End Examinations

7.1 Performance of students in all subjects is assessed continuously through internal assessment tests and an End examination

7.2 Allocation of internal assessment and End examination marks

7.2.1 For theory subjects, the allocation is 30 marks for internal assessment and 70 marks for End examination totalling 100 marks

7.2.2 For laboratory/drawing/project work subjects, the allocation is 50 marksfor internal assessment and 50 marks for End examination totalling 100 marks

7.2.3 For seminar/viva voce/industrial training subjects, the allocation is 100 marks for internal assessment.There is no end examination for these subjects

7.2.4 For audit subjects the allocation is 30 marks for internal assessment and no allocation for End examination. These marks are specified for purpose of clause 9.3, and do not account for any credits

7.3 Internal Assessment Examinations

7.3.1 Internal assessment means performance evaluation of students by faculty members who teach the subjects

7.3.2 For theory subjects, including audit subjects, the internal assessment shall be done bytwo midterm tests. The faculty member of the concerned subject will assess the marks in midterm tests

Each midterm test will be of one and half hour duration and evaluated for 30 marks. Internal assessment marks in a subject will be calculated as weighted sum of the two midterm test marks in that subject.The weights are: 20% for the minimum midterm marks and 80% for the maximum midterm marks. Any fractional mark after adding all contributions is rounded up to next integer mark

If any student abstains for any midterm test, she or he will be awarded zero marks for that midterm test

7.3.3 For laboratory/practical/drawing subjects, the internal assessment will be based on regular laboratory work over full semester. The assessment

will be done by the faculty concerned. The students shall be informed sufficiently early of the procedure to be followed for internal assessment

7.3.4 For self-study subjects, the assessment is through assignments, quizzes, seminars and/or viva-voce. The students shall be informed sufficiently early of the procedure to be followed for assessment

7.3.5 For subjects like seminar, project-work, industrial training, and comprehensive viva-voce, the internal assessment will be done by a Department Committee consisting of two senior faculty members and faculty guide of concerned student. The assessment procedure will be informed sufficiently early to the students

7.4 End examinations

7.4.1 End examinations shall be conducted after completion of coursework in each semester

7.4.2 The question papers for theory subjects shall be set by faculty members outside of the Institute. The external faculty members for question paper setting shallbe appointed by the Principal

7.4.3 Evaluation of answer scripts shall be done by examinersappointed by the Principal

7.4.4 For laboratory subjects, end examination shall be conducted by a committee consisting of twointernal examiners. One examiner shall be appointed by Head of Department of concerned Major, and the other examiner shall be appointed by the Principal

7.4.5 For project work viva-voce, end examination shall be conducted by a committee consisting of one internal examiner, one external examiner, and the concerned guide of the student. Internal examiner shall be appointed by Head of Department of concerned Major, and the external examiner shall be appointed by the Principal

7.4.6 If a student abstains from End examination of any subject, for any reason, she or he shall be awarded zero marks in that subject

7.4.7 There is no end examination for self-study and audit subjects

8.0 Method of Assigning Letter Grades and Grade Points

8.1 For all credit-bearing subjects, performance of a student in a subject is indicated by a letter grade that corresponds to absolute marks earned in that subject. Each letter grade is assigned a numeric Grade Point that is used to compute Grade Point Average on a scale of 0 to 10

8.2 Performance of a student in both internal assessment and End examination will be considered for awarding grades for credit bearing subjects. Total marks earned in a subject is the sum of marks obtained in internal and End examinations in that subject

8.3 Pass grade A+ to D- is assigned to a subject based on total marks earned in that subject provided that a student earns at least i) 35% of marks in End examination marks and ii) 40% of marks in internal and End examination marks put together; otherwise fail grade F will be assigned to that subject

8.4 Grade I will be assigned to a subject if a disciplinary action is pending and is not resolved before publication of results. Office of Controller of Examinations shall resolve the pending disciplinary action within six working days from the date of publication of results and change the grade to any of A+ to D- or F

8.5 Grade X will be assigned to a subject if a student abstains for End examination of that subject

8.6 The absolute marks and corresponding letter grade and grade points are given in Table2

Table 2 Letter Grades and Grade Points

Absolute Marks	Letter Grade	Grade Points	Remark
95-100	A+	10.0	Pass
90-94	A	9.5	Pass
85-89	A-	9.0	Pass
80-84	B+	8.5	Pass
75-79	B	8.0	Pass
70-74	B-	7.5	Pass
65-69	C+	7.0	Pass
60-64	C	6.5	Pass
55-59	C-	6.0	Pass
50-54	D+	5.5	Pass
45-49	D	5.0	Pass
40-44	D-	4.5	Pass
0-39	F	0.0	Fail
-	I	0.0	Result Withheld
-	X	0.0	Absent for End Exam

8.7 SGPA: Semester Grade Point Average indicates the performance of a student in all credit-bearing subjects of a semester. SGPA is calculated as the weighted average of Grade Points of allsubjects of the semester with corresponding credits of subjects as weights. Audit and self-study subjects are not considered for SGPA calculation

8.8 CGPA: Cumulative Grade Point Average indicates the performance of a student in all semesters up to and including the current semester under consideration. CGPA is calculated as the weighted average of SGPAs with total credits in each semester as the weights

8.9 Grade Card: All students shall be issued Grade Cards after the publication of results of a semester. Grade Card is a statement of performance of a student

in a semester. It contains information about each registered subject: type of subject, allocated credits, and letter grade earned.SGPA and CGPA will also be indicated

9.0 Requirements for Completing Subjects

9.1 A student shall complete all credit-bearing and audit subjects successfully to be eligible for award of degree

9.2 Credit-bearing subjects: A student is considered to have completed a credit-bearing subject successfully and earned credits if she or he obtains a pass grade from A+ to D- in that subject. If a student receives fail grade F or X in any subject, she or he must register for supplementary End examination for that subject as and when opportunity arises and improve grade to pass grade

9.3 Audit subjects: A student is considered to have successfully completed an audit subject if she or he earns at least 40% of marks in internal assessment marks. A student may request for makeup tests to satisfy this requirement by paying requisite fee

9.4 Self-study subjects: Based on internal assessment, the faculty guide concerned will certify whether a student has successfully completed the subject or not. Grade card will list successfully completed self-study subjects

10.0 Requirements for taking End Examinations and Promotion

10.1 A student is eligible to take regular End Examinations of current semester if she or he full fills the attendance requirement

10.2 A student shall be promoted from current semester to succeeding semester on satisfying the attendance and total credits-earned requirements

10.3 Attendance Requirement

10.3.1 Attendance of students shall be recorded for credit-bearing and audit subjects as per the workload indicated in curriculum

10.3.2 Total class-periods conducted shall be reckoned from beginning to end of a semesteras published in academic calendar

10.3.3 Aggregate Percentage of Attendance is calculated using total number of class-periods attended as numerator and total number of class-periods conducted for the concerned class as the denominator

10.3.4 A minimum aggregate attendance of 75% is required for promotion to succeeding semesterand be eligible to take End examinations of current semester

10.3.5 A student can appeal to the Principal for condoning deficiency in aggregate attendance if she or he gets 65% or more aggregate attendance presenting a valid reason for deficiency. Such a student will be granted promotion if the Principal pardons the deficiency. Principal has the right to reject the appeal if he/she is not satisfied with the performance of the student or the reason cited for deficiency of the attendance

10.3.6 A student earning less than 65% aggregate attendance will be denied promotion. A student who is not promoted on basis of attendance shall be removed from the rolls and shall register for the same semesterwhen opportunity arises. The current semesterrecord of the student is cancelled automatically

10.4 Credits-Earned Requirement

10.4.1 This rule is applicable for promotion of a student from fourth semester to fifth semester, and from sixth semester to seventh semester

10.4.2 A student who is denied promotion for want of requisite credits shall take supplementary examinations, as and when offered, and earn credits to be eligible for promotion

10.4.3 For promotion from fourth semester to fifth semester, a student must earnat least 26 credits from first semester to third semester subjects

10.4.4 For promotion from sixth semester to seventh semester, a student must earn at least 44 credits from firstsemester to fifth semester subjects

10.5 A student can forego promotion and opt to repeat the currentsemester on written request. Recommendation of the concerned Faculty Advisor is required for cancellation of promotion. This option shall be exercised before the commencement of the End examinations of the current semester

11.0 Revaluation of End Examination Scripts

11.1 Revaluation of End Examination scripts is allowed for theory subjects only by paying requisite fee

11.2 Procedure for Revaluation: The script will be revaluated by an examiner appointed by the Principal. The maximum of revaluation and regular end examination marks will be awarded for that subject

11.3 A student can apply for revaluation in a subject only once

12.0 SupplementaryEnd Examinations

12.1 Students are eligible to take Supplementary examinations in subjects with fail grade F or X only

12.2 Supplementary examinations for even semester subjects will be conducted along with regular examinations of odd semester subjects

12.3 Supplementary examinations for odd semester subjects will be conducted along with regular examinations of even semester subjects

12.4 For eighth semester, special supplementary examinations will be conducted in second week following the results publication date of regular examination of eighth semester

12.5 A student will be allowed to improve grade in any theory subject provided she or he has completed coursework of all semesters but before award of provisional/final degree

13.0 Requirements for Award of B. Tech degree

13.1 Time Limit for completion of requirements for award of degree is eight academic years from the date of admission. A student who could not complete all the requirements in this time limit shall forego admission and will be removed from the rolls of the Institute

13.2 A student shall be eligible for award of B. Tech degree provided she or he has:

13.2.1 Registered and successfully completed all requiredcredit-bearing and audit subjects with a total of 180 credits

13.2.2 Secured a CGPA of 4.5 or more

13.2.3 Cleared all dues to the Institute, library and hostel

13.2.4 No disciplinary action is pending against her or him

13.2.5 Satisfied any other stipulation of the affiliating University

13.3 Award of Class: Each student will be given class in degree based on CGPA as follows:

Table 3 Class of Degree

Class of Degree	Range of CGPA
Pass Class	>= 4.5 but <5.5
Second Class	>= 5.5 but <6.5
First Class	>= 6.5 but <7.5
First Class with Distinction	>= 7.5

13.4 Degree will issued under the seal of affiliating University

14.0 Transitory Regulations

14.1 A student who initially joins the Institute in a previous Regulation and has to re-join in a semester of the present Regulations, due to any reason, shall be bound by the rules of the current Regulations. Board of Studies of the concerned Major will specify, extra or otherwise, academic coursework to be undertaken by such students who re-join the current Regulations

For B. Tech (Computer Science and Engineering)

I SEM

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1521101	BS	Mathematics-1	3	1	0	30	70	3
1521102	BS	Mathematics-2	3	1	0	30	70	3
1503103	ED	Engineering Graphics	4	0	0	30	70	3
1524104	HS	English-1	1	0	3	30	70	3
1505105	ED	Programming in C	3	1	0	30	70	3
1501106	HS	Environmental Studies	4	0	0	30	70	3
1505107	ED	Programming in C Lab	0	0	3	50	50	2
1599108	ED	Engineering Workshop	0	0	3	50	50	2
		Total	18	3	9	280	520	22

II SEM

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1522201	BS	Engineering Physics	3	1	0	30	70	3
1521202	BS	Mathematics-3	3	1	0	30	70	3
1523203	BS	Engineering Chemistry	3	1	0	30	70	3
1524204	HS	English-2	4	0	0	30	70	3
1505205	PJ	Introduction to Data Structures	3	1	3	30	70	3
1525206	HS	Human Values and Professional Ethics	4	0	0	30	70	3
1524207	HS	English Language and Communication Skills Lab	0	0	3	50	50	2
1599208	BS	Physics and Chemistry Lab	0	0	3	50	50	2
		Total	18	3	9	280	520	22

III SEM

S.No.	Subject Code	SUBJECT	SC	L	T	P	IM	EM	CR
1.	1599301	Electrical & Electronics Engineering	PN	3	1	0	30	70	3
2.	1505302	Advanced Data Structures	PJ	3	1	0	30	70	3
3.	1505303	Digital Logic Design	PJ	3	1	0	30	70	3
4.	1505304	Discrete Mathematics	PJ	4	0	0	30	70	3
5.	1525305	Managerial Economics & Financial Analysis	PN	3	1	0	30	70	3
6.	1505306	Object Oriented Programming through C++	PJ	3	1	0	30	70	3
7.	1505307	Object Oriented Programming & Data Structures Lab	PJ	0	0	3	50	50	2
8.	1599308	Electrical & Electronics Engineering Lab	PN	0	0	3	50	50	2
		Total:		19	5	6	280	520	22

IV SEM

S.No.	Subject Code	SUBJECT	SC	L	T	P	IM	EM	CR
1.	1521401	Probability & Statistics	HS	3	1	0	30	70	3
	1505402	Operating Systems	HS	4	0	0	30	70	3
2.	1505403	Database Management Systems	PJ	3	1	0	30	70	3
3.	1505404	Formal Languages & Automata Theory	PJ	3	1	0	30	70	3
4.	1505405	Java Programming	PJ	3	1	0	30	70	3
5.	1505406	Computer Organization	PJ	4	0	0	30	70	3
6.	1525407	Database Management Systems Lab	PJ	0	0	3	50	50	2
7.	1505408	Java Programming Lab	PJ	0	0	3	50	50	2
		Total:		20	4	6	280	520	22

V SEM

S.No.	Subject Code	SUBJECT	SC	L	T	P	IM	EM	CR
1.	1505501	Operating Systems	PJ	3	1	0	30	70	3
2.	1505502	Computer Networks	PJ	4	0	0	30	70	3
3.	1505503	Software Engineering	PJ	4	0	0	30	70	3
4.	1505504	Compiler Design	PJ	3	1	0	30	70	3
5.	 1505505 1505506 1505507	CBCC Mobile Application Development Multimedia Application Development Middleware Technologies	PJ	3	1	0	30	70	3
6.	1504508	Micro Processors	PN	4	0	0	30	70	3
7.	1505509	Software Lab	PJ	0	0	3	50	50	2
8.	1524510	Advanced English and Communication Skills Lab	HS	0	0	3	50	50	2
		Total:		21	3	6	280	520	22

VI SEM

S.No.	Subject Code	SUBJECT	SC	L	T	P	IM	EM	CR
1..	1505601	Object Oriented Analysis & Design	PJ	4	0	0	30	70	3
2.	1505602	Design & Analysis of Algorithms	PJ	3	1	0	30	70	3
3.	1505603	Web Technologies	PJ	4	0	0	30	70	3
4.	1505604	Computer Graphics	PJ	3	1	0	30	70	3
5.	1503605	Artificial Intelligence	PJ	3	1	0	30	70	3
6.	 1505606 1505607 1505608	CBCC Principles of TCP/IP Mobile Adhoc & Wireless Sensor Networks High Speed Networks	PJ	4	0	0	30	70	3
7.	1504609	Microprocessors Lab	PN	0	0	3	50	50	2
8.	1505610	Web Technologies & UML Lab	PJ	0	0	3	50	50	2
		Total:		21	3	6	280	520	22

VII SEM

S.No.	Subject Code	SUBJECT	SC	L	T	P	IM	EM	CR
1.	1525701	Managerial Economics & Financial Analysis	HS	4	0	0	30	70	3
2.	1505702	Data Warehousing & Data Mining	PJ	4	0	0	30	70	3
3.	1505703	Cloud Computing	PJ	3	1	0	30	70	3
4.	1505704	Software Testing	PJ	4	0	0	30	70	3
5.	 1505705 1505706 1505707	CBCC Software Project Management Digital Image Processing Advanced Computer Architecture	PJ	4	0	0	30	70	3
6.	1505708	Big Data	PJ	4	0	0	30	70	3
7.	1505709	Soft Testing and Case tools lab	PJ	0	0	3	50	50	2
8.	1505710	Data Warehousing & Data Mining Lab	PJ	0	0	3	50	50	2
		Total:		23	1	6	280	520	22

VIII SEM

S.No.	Subject Code	SUBJECT	SC	L	T	P	IM	EM	CR
1.	1525801	Management Science	HS	4	0	0	30	70	3
2.	1505802	Cryptography & Network Security	PJ	4	0	0	30	70	3
3.	1505803	Software Architecture & Design Patterns	PJ	4	0	0	30	70	3
4.	 1505804 1505805 1505806	CBCC/MOOC Information Retrieval System Soft Computing Human Computer Interaction	PJ	4	0	0	30	70	3
5.	1505807	Seminar & Comprehensive Viva Voce	PJ	-	-	-	100	--	4
6.	1505808	Project Work	PJ	-	-	-	50	50	10
		Total:		16	0	0	270	330	26

Annexure-1 Syllabus

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1521101	BS	Mathematics-1	3	1	0	30	70	3

Objectives:

* To make the students to understand differential equations and to make use these equations not only in mathematics but also in solving engineering problems.

* To make the students to understand the importance of differential calculus double integrals and triple integrals.

Unit I: Differential equations of first order and first degree: Exact, Non exact, Linear and Bernoulli equations. Applications: Orthogonal trajectories, Newton's law of cooling, Law of natural growth and decay.

Unit II: Linear differential equations of second and higher order with constant coefficients and R.H.S term of the type e^{ax}, sin ax, cosax, polynomials in x ,e^{ax} V(x), xV(x) - Method of variation of parameters.

Unit III: Simple examples of Taylor's and Maclaurin's series – Functions of two or more variables Jacobians – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

Unit IV: Curvature: Curvature of a curve – Curvature of a circle – Radius of a curvature – Centre of Curvature – Equation to the circle of curvature. Curve tracing – Cartesian, polar and parametric curves.

Unit V: Multiple Integrals: Evaluation of double integrals in Cartesian coordinates, and polar coordinates - Change of variables in double integrals - Change the order of integration in double integrals - Evaluation of triple integrals in Cartesian and polar coordinates - Change of variables in triple integrals.

Text Books:

1. Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-42 edition.
2. Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd

Reference Books:

1. Advanced Engineering Mathematics, Erwin Kreyszig, Willey Publications, 9th edition- 2013
2. Engineering Mathematics Volume-1, Dr.D.S Chandra Sekharaiah, Prism Books Pvt. Ltd.
3. Advanced Engineering Mathematics by N. Bali, M Goyal, Firewall Media 7th edition.
4. Engineering Mathematics, Volume – I & II, E. Rukmangadachari& E. Keshava Reddy, Pearson Publisher Ist Edition (2010).

Outcomes:

Students are able to understand and apply differential equations in solving hydro dynamics and fluid mechanics problems

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1521102	BS	Mathematics-2	3	1	0	30	70	3

Objectives:

* To make the students to understand Fourier series and apply them in solving problems.

* To inculcate the concept of partial differential equations and its application to solve wave equation and heat equations.

* To make the students to understand Laplace transforms and inverse Laplace transforms.

* The students gain the knowledge about vector differentiation and vector integration.

Unit I: Vector calculus - Vector differentiation: Scalar point function - Vector point function -Vector operator Del – Gradient – Divergence - Curl . Vector integration: Line, Surface and Volume integrals .Green's theorem in a plane, Stoke's theorem and Gauss-divergence theorems (Statements only). Applications of Green's ,Stoke's and Gauss divergence theorems.

Unit II: Laplace transforms of standard functions – Properties of Laplace Transforms - Transforms of derivatives and integrals- Evaluation of integrals by Laplace transforms – Unit step function – Second shifting theorem – Dirac's delta function. Laplace transform of periodic functions.

Unit III: Convolution theorem. Inverse Laplace Transforms – Applications of Laplace transforms to ordinary differential equations.

Unit IV: Fourier series: Determination of Fourier coefficients - Fourier series - Even and odd functions - Fourier series in an arbitrary interval - Functions having points of discontinuity- Half range Fourier sine and cosine expansions.

Unit V: Partial Differential Equations: Formation of partial differential equations by eliminating arbitrary constants and arbitrary functions - Method of separation of variables. Solution of one dimensional wave equation - Solution of one dimensional heat equation.

Text Books:

1..Higher Engineering Mathematics, Dr.B.SGrewal, Khanna Publishers-42 edition.

2.Higher Engineering Mathematics, B.V.Ramana, Mc. Graw Hill Education (India) Pvt. Ltd.

Reference Books:

5. Advanced Engineering Mathematics, Erwin Kreyszig, Willey Publications, 9th edition- 2013
6. Engineering Mathematics Volume -1, Dr.D.S Chandra Sekharaiah, Prism Books Pvt. Ltd.
7. Advanced Engineering Mathematics by N. Bali, M Goyal, Firewall Media 7th edition.
8. Engineering Mathematics, Volume – I &II , E. Rukmangadachari& E. Keshava Reddy, Pearson Publisher Ist Edition (2010).
9. Fourier Series and Integral Transforms by Prof. S. Sreenadh, S. Ranganatham, Dr.M.V.S.S.N. Prasad, Dr. V. Ramesh Babu – S. Chand & Company Pvt. Ltd.

Outcomes:

- Students are able to apply Fourier series in harmonic analysis.
- Students are able to understand wave equation and heat equations and solve them by the method of separation of variables.
- Students are able to understand Laplace transforms and vector calculus concepts and their applications.

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1503103	ED	Engineering Graphics	1	0	3	30	70	3

COURSE OBJECTIVE:

By studying the engineering drawing, a student becomes aware of how industry communicates technical information. Engineering drawing teaches the principles of accuracy and clarity in presenting the information necessary about objects.

- This course develops the engineering imagination i.e., so essential to a successful design. Learning techniques of engineering drawing changes the way one thinks about technical images.
- It is ideal to master the fundamentals of engineering drawing first and to later use these fundamentals for a particular application, such as computer aided drafting. Engineering Drawing is the language of engineers and by studying this course, engineering students will eventually be able to prepare drawings of various objects being used in technology.

UNIT-1:

INTRODUCTION TO ENGINEERING DRAWING

Principles of Engineering Graphics and their significance- Drawing instruments and their use- Conventions in Drawing- Lettering- BIS Conventions.

Curves used in Engineering Practice: (a) Conic sections –General methods only
(b) Cycloid, Epicycloids and Hypocycloid
(c) Involutes

UNIT- II: PROJECTION OF POINTS AND LINES: Principles of orthographic projection-conventions-First and Third angle projections. Projections of points, Lines inclined to one or both planes, Problems on projections, Finding True lengths & traces.

UNIT- III: PROJECTION OF PLANES: Projections of regular plane surfaces/figures, Projection of planes using auxiliary planes.

PROJECTIONS OF SOLIDS: Projections of regular solids inclined to one or both planes..

UNIT- IVSECTIONS OF SOLIDS: Section planes and sectional views of right regular solids- Prism, Cylinder, Pyramid and Cone. True shape of sections

UNIT- VORTHOGRAPHIC PROJECTIONS: Conversion of isometric projections/views to Orthographic Views- Conventions.

TEXT BOOKS:

1. Engineering Drawing, N.D.Bhat, Charotar Publishers
2. Engineering Drawing, K.L. Narayana,P.Khanniah, Scitech Pub.
3. Engineering Drawing, BasantAgrawal,C.M.Agrawal, Tata McGraw-Hill

REFERENCES:

1. Engineering Drawing, Shah and Rana, 2/e,Pearson Education
2. Engineering Drawing,B.V.R. Guptha,J.K.Publishers
3. Engineering Drawing and Graphics, Venugopal, New age Publishers
4. Engineering Drawing, Johle, Tata McGraw-Hill

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1524104	HS	English-1	4	0	0	30	70	3

Objectives:

- To improve the language, proficiency of the students in English with an emphasis on LSRW Skills.
- To develop an awareness in the students about the significance of silent reading and comprehension.
- To equip the students to study academic subjects with greater facility through theoretical and practical components of the syllabus.
- To develop study skills as well as communication in formal and informal situations.
- To enable students to express themselves fluently and appropriately in social and professional contexts.
- To develop an awareness in the students about writing as an exact and formal skill.

UNIT – I

An Astrologer's day – R.K. Narayan
My struggle for an education – Booker T. Washington
Grammar – Identification and Interchange of parts of speech.

UNIT – II

Building A New State – Dr.A.P.J. Abdul Kalam
The Happy Prince – Oscar Wilde
Grammar – Reading comprehension

UNIT – III

The woodrose – AbburiChayadevi

MokshagundamVisveswaraiah – A Biography

Grammar – Vocabulary

UNIT – IV

HomiJehangir Baba – A Biography

If – Rudyard Kipling

Grammar – Transformation sentences

UNIT – V

Remedial Grammar

Reference Books

1. Glossary of Grammatical Terms – Geogrey Leech
2. Practical English Usage – Michal Swan
3. English Grammar and Composition - Wren and Martin
4. Advanced English Grammar & Composition – M.P. Bhatia
5. English Improvement Course – Dhillon

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1505105	ED	Programming in C	3	1	0	30	70	3

Course Objectives:

- To understand the syntax and semantics of C programming language and other features of the language
- To learn logical skills for solving problems, implement them using C language

UNIT I

Introduction to Computers: Computer Systems, Computing Environment, Computer Languages, Creating and Running Programs, System Developments, Algorithms, Flowcharts.

Introduction to the C Language: Introduction, C programs, Identifiers, Types, Variables, Constants, Input and Output, Programming Examples.

UNIT II

Structure of C program: Expressions, Precedence and Associativity, Evaluating Expressions, Type Conversion, Statements, Sample Programs.

Selections and Making Decisions: Logical Data and Operators, Two-way Selection, Multiway Selection.

UNIT III

Repetition: Concept of Loop, Pretest and Post-test Loops, Initialization and Updation, Event and Counter Controller Loop, Loops in C, Looping Applications

Functions: Introduction, User Defined Functions, Inter-Function Communication, Standard Functions, Scope, Programming Examples.

UNIT IV

Arrays: Introduction, Two Dimensional Arrays, Multi-Dimensional Arrays, Inter Function Communication, Array Applications, Exchange(Bubble) Sort, Binary Search, Linear Search.

Strings: String Concepts, C Strings, Sting Input/output Functions, Arrays of Strings, String Manipulation Functions, String/Data Conversion.

UNIT V

Enumerated, Structure, and Union Types: The Type Definition, Enumerated Types, Structure, Unions, Programming Applications.

Bitwise Operators: Exact Size Integer Types, Logical Bitwise Operators, Shift Operators, Mask, Introduction to Pointers and File management.

TEXT BOOKS:

1. Computer Science, A Structured Programming Approach Using C, Behrouz A. Forouzan& Richard F. Gilberg, Third Edition, Cengage Learning
2. Programming in ANSI C, E. Balagurusamy, Fifth Edition, McGraw Hill.

REFERENCE BOOKS:

1. How to solve it by Computer by R.G. Dromey, Pearson
2. Computer Fundamentals and C Programming, Second Edition, Dr. P. Chenna Reddy.

3. Programming in C: A Practical Approach, Ajay Mittal, Pearson.
4. The C programming Language, B. W. Kernighan and Dennis M. Ritchi, Pearson Education.
5. Problem Solving and Programming Designs in C, J. R. Hanly and E.B. Koffman.,
6. Programming with C RemaTheraja, Oxford
7. Problem Solving with C, M.T.Somashekara, PHI
8. C Programming with problem solving, J.A. Jones & K. Harrow,Dreamtech Press
9. Programming with C, R.S.Bickar, Universities Press

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1501106	HS	Environmental Studies	4	0	0	30	70	3

Unit I

Multidisciplinary nature of environmental studies: Definition, scope and importance – Need for public awareness; Natural Resources: Renewable and non-renewable resources – Natural resources and associated problems; (a) Forest resources – Use and over-exploitation, deforestation, case studies – Timber extraction, mining, dams and their effects on forest and tribal people; (b) Water resources – Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems;

(c) Mineral resources – Use and exploitation, environmental effects of extracting and using mineral resources, case studies; (d) Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies; (e) Energy resources –Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies; (f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification; Role of an individual in conservation of natural resources; equitable use of resources for sustainable lifestyles

Unit II

Ecosystems: Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids; Introduction, types, characteristic features, structure and function of the following ecosystems (a) Forest ecosystem, (b) Grassland ecosystem, (c) Desert ecosystem, (d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit III

Biodiversity and its conservation: Introduction – Definition : genetic, species and ecosystem diversity; Bio-geographical classification of India; Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values; Biodiversity at global, National and local levels; India as a mega-diversity nation; Hot-sports of biodiversity; Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts; Endangered and endemic species of India; Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity

Unit IV

Environmental Pollution: Definition – 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; Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution – Pollution case studies; Disaster management: floods, earthquake, cyclone and landslides

Unit V

Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns; • Environmental ethics : Issues and possible solutions; Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies; Wasteland reclamation; Consumerism and waste products; Environment Protection Act; Air (Prevention and Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act; Issues involved in enforcement of environmental legislation; Public awareness

Human Population and the Environment: Population growth, variation among nations – Population explosion – Family Welfare Programme; Environment and human health; Human Rights; Value Education; HIV/AIDS; Women and Child Welfare; Role of Information Technology in Environment and human health, case studies; Field work: Visit to a local area to document environmental assets

river/forest/grassland/hill/mountain - Visit to a local polluted site-Urban/Rural/Industrial/Agricultural; Study of common plants, insects, birds; Study of simple ecosystems-pond, river, hill slopes, etc.

TEXTBOOKS:

1. Text book of Environmental Studies for Undergraduate Coursesby ErachBharucha for University Grants Commission,Universities Press.
2. Environmental Studies by Benny Joseph,Mc.Graw HillPublications.
3. Principles and a basic course of Environmental science for under graduate course by Kousic, KouShic.
4. Text book of Environmental Sciences and Technology by M.AnjiReddy, BS Publication.

REFERENCES:

1. Environmental sciences and engineering – J. Glynn Henry and Gary W. Heinke – Printice hall of India Private limited.
2. Environmental Studies by AninditaBasak – Pearson education
3. Introduction to Environmental engineering and science by Gilbert M. Masters and Wendell P. Ela - Printice hall of India Private limited

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1505107	ED	Programming in C Lab	0	0	3	50	50	2

Objectives:

- To make the student lear n C Programming language.
- To make the students sol ve problems, implement them using C language.

The Student is expected to solve at least 12 assignments from different concepts (every year 12 different experiments).

SAMPLE LIST OF EXPERIME NTS:

1. Practice DOS/LINUX co mmands necessary for design of C programs.
2. Write, edit, debug, compile and execute sample C programs to understa nd the programming environment.
3. a) Write a C program to find the sum of the individual digits of a given num ber.

   b) Write a C program to c heck whether a given number is a palindrome or n ot.
4. a) Write a C program to g enerate & print first n terms of the Fibonacci sequence.

   b) Write a C program to find the roots of a quadratic equation.
5. a) Write a C program to c ompute the factorial of a given number.

   b) Write a C program to g enerate all the prime numbers within a given range
6. a) Write a C program to g enerate PASCAL triangle.

   b) Write a C program to find the GCD of two integers.
7. a) Write a C program to e valuate the function Sin(x) as defined by the infinite series expression.

   $$\text{Sin}(x) = \frac{x}{1!} - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \cdots .$$

   b) Write a C program to find the square root of a given number.
8. a) Write a C program to find both smallest and largest number in a list of integers.

   b) Write a C program to perform multiplication of two matrices.
9. Write a C program to read a matrix and perform the following operations.

   i) Print transpose of a matrix.

   ii) Removal of duplicates from an ordered array.
10. a) Write a C program to p erform arithmetic operations using functions.

    b) Write a C program to find the factorial of a given number using recursive function.
11. a) Write a C program to count the number of vowels, constants, blank spac es, digits and special characters in a given string.

    b) Write a C program to c heck whether a given string is palindrome or not.
12. Write a C program to read two strings and perform the following operations without using built-in string library functions.

    i) String length det ermination.

ii) Comparison of two strings.

iii) Concentration of two strings.

iv) String reversing.

12. Write a C program to define a structure with the following members.

    Roll No., Name, marks in Sub1, Sub2, Sub3. Read the n students records and find the total marks of each student and print the result in the following format.

Roll No.	Name	Sub1	Sub2	Sub3	Total Marks	Result
1234	XXX	40	50	90	180	Distinction

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1599108	ED	Engineering Workshop	0	0	3	50	50	2

PART A – Engineering Workshop

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.

1. TRADES FOR EXERCISES:

a. Carpentry shop– Two joints (exercises) involving tenon and mortising, groove and tongue: Making middle lap T joint, cross lap joint, mortise and tenon T joint, Bridle T joint from out of 300 x 40 x 25 mm soft wood stock

b. Fitting shop– Two joints (exercises) from: square joint, V joint, half round joint or dove tail joint out of 100 x 50 x 5 mm M.S. stock

c. Sheet metal shop– Two jobs (exercises) from: Tray, cylinder, hopper or funnel from out of 22 or 20 guageG.I. sheet

d. House-wiring– Two jobs (exercises) from: wiring for ceiling rose and two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp, wiring for a water pump with single phase starter.

e. Foundry– Preparation of two moulds (exercises): for a single pattern and a double pattern.

f. Welding – Preparation of two welds (exercises): single V butt joint, lap joint, double V butt joint or T fillet joint

REFERENCE BOOKS:

1. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers.
2. Engineering Practices Lab Manual, Jeyapoovan, SaravanaPandian, 4/e Vikas
3. Dictionary of Mechanical Engineering, GHFNayler, Jaico Publishing House

PART B – IT Workshop

Course Objectives:

- To provide Technical training to the students on Productivity tools like Word processors, Spreadsheets, Presentations.
- To make the students know about the internal parts of a computer, assembling a computer from the parts, preparing a computer for use by installing the operating system.
- To learn about Networking of computers.

Task 1: Learn about Computer: Identify the internal parts of a computer, and its peripherals.

Represent the same in the form of diagrams including Block diagram of a computer. Write specifications for each part of a computer including peripherals and specification of Desktop computer. Submit it in the form of a report.

Task 2: Assembling a Computer: Disassemble and assemble the PC back to working condition. Students should be able to trouble shoot the computer and identify working and non-working parts. Student should identify the problem correctly by various methods available (eg: beeps). Students should record the process of assembling and trouble shooting a computer.

Task 3:Install Operating System: Student should install Linux on the computer. Student may install another operating system (including proprietary software) and make the system dual boot or multi boot. Students should record the entire installation process. Students should record the various features that are supported by the operating system(s) installed. They have to submit a report on it. Students should be able to access CD/DVD drives, write CD/DVDs, access pen drives, print files, etc. Students should install new application software and record the installation process.

Task 4: Networking: Students should connect two computers directly using a cable or wireless connectivity and share information. Students should connect two or more computers using switch/hub and share information. Crimpling activity, logical configuration etc should be done by the student. The entire process has to be documented.

Task 5:Word Processor: Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, Inserting header and Footer, changing the font, changing the color, including images and tables in the word file, making page setup, copy and paste block of text, images, tables, linking the images which are present in other directory, formatting paragraphs, spell checking, etc. Students should be able to prepare project cover pages, content sheet and chapter pages at the end of the task using the features studied. Students should submit a user manual of the word processor considered.

Task 6:Presentations: creating, opening, saving and running the presentations, Selecting the style for slides, formatting the slides with different fonts, colors, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyperlinking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.

REFERENCE BOOKS:

1. 1. Introduction to Computers, Peter Norton, McGraw Hill.
2. MOS study guide for word, Excel, Powerpoint& Outlook Exams", Joan Lambert, Joyce Cox, PHI.
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. Networking your computers and devices, Rusen, PHI.

Trouble shooting, Maintaining& Repairing PCs", Bigelows, TMH

ubject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1522201	BS	Engineering Physics	3	1	0	30	70	3

CourseObjective:

- Toevokeinterestonapplicationsofsuperpositioneffectslikeinterferenceanddiffraction,themechanismsofemissionoflight,achievingamplificationofelectromagneticradiationthroughstimulatedemission,studyofpropagationoflightthroughtransparentdielectricwaveguidesalongwithengineeringapplications.
- Toenlightentheperiodicarrangementofatomsincrystals,directionofBraggplanes,crystalstructuredeterminationbyX-raysandalso to know the role of ultrasonic's in non-destructive testing..
- Togetaninsightintothemicroscopicmeaningofconductivity,classicalandquantumfreeelectronmodel,theeffectofperiodicpotentialonelectronmotion,evolutionofbandtheorytodistinguishmaterialsandtounderstandelectrontransportmechanisminsolids.
- Toopennewavenuesofknowledgeandunderstandingonsemiconductorbasedelectronicdevices,basicconceptsandapplicationsofsemiconductorandmagneticmaterialshavebeenintroducedwhichfindpotentialintheemergingmicrodeviceapplications.
- Togiveanimpetusonthesubtlemechanismofsuperconductorsintermsofconductionofelectronpairs usingBCStheory,differentpropertiesexhibitedbythemandtheirfascinatingapplications.Considering thesignificanceofminiaturizationofelectronicdevicesandsignificanceoflowdimensionalmaterials,thebasicconceptsofnanomaterials,theirsynthesis,propertiesandapplicationsinmodernemerging technologiesareelicited.

UNIT – 1: PHYSICAL OPTICS, LASERS AND FIBRE OPTICS

PHYSICAL OPTICS :- Interference, Interference in thin films by reflection – Newton's Rings- Fraunhofer diffraction due to single slit, double slit and diffraction grating.

LASERS:- Introduction –characteristics of laser-Spontaneous and stimulated emission of radiation-Einstein's coefficients-population inversion – Excitation mechanisms and optical resonator-NDYAG laser – He-Ne laser- Application of lasers.

FIBER OPTICS:- Introduction-Construction and working principle of optical fiber-Numerical aperture and acceptance angle- Types of optical fibers- Black diagram of Optical fiber communication system-Applications of optical fibers.

UNIT – 2: CRYSTALLOGRAPHY AND ULTRASONICS

CRYSTALLOGRAPHY:- Introduction –Space lattice –unit Cell lattice parameters- Bravis lattice – Crystal systems- Packing fractions of SC, BCC and FCC – Directions and planes in Crystals – Miller indices – InterPlanar spacing in cubic crystal – X-ray diffraction – Bragg's law powder method.

ULTRASONICS:- introduction- production of ultrasonic's by piezoelectric method- properties and detection- applications in non –destructive testing.

UNIT-3: QUANTUM MECHANICS AND ELECTRON THEORY

QUANTUM MECHANICS: Introduction to matter waves – de'Broglie hypothesis – Schrodinger's time independent wave equation – Physical Significance of wave function – Particle in one dimensional infinite potential well .

ELECTRON THEORY: Classical free electron theory – Sources of electrical resistance – Equation for electrical conductivity – Quantum free electron theory – Fermi-Dirac distribution -Kronig-Penny model

(qualitative) – Origin of bands in solids – Classification of solids in to conductors, semiconductors and insulators .

UNIT- 4: ENGINEERING MATERIALS

MAGNETIC MATERIALS:- Introduction and basic definitions- Origin of Magnetic moments- Bohr magneton- Classification of magnetic materials into dia, para, ferro, antiferro and ferri magnetic materials-Hysteresis- Soft and hard magnetic materials and applications of magnetic materials.

SUPERCONDUCTORS: Introduction- effect of magnetic field-Meissner effect- Type I and Type II Superconductors- Flux quantization- London penetration depth- ac and dc Josephson effects- BCS theory(Qualitative)- Applications of superconductors.

UNIT- 5: PHYSICS OF SEMICONDUCTORS AND NANO MATERIALS

SEMICONDUCTOR PHYSICS: Introduction- Intrinsic and extrinsic semiconductors- Drift and diffusion currents and Einstein's equation- Hall effect- Direct and Indirect band gap semiconductors- Formation of P-n junction.

PHYSICS OF NANO-MATERIALS:- Introduction- Significance of Nano-scale and types of nano-materials- physical properties: optical, thermal, mechanical and magnetic properties- Synthesis of nano-materials: ball mill, chemical vapour deposition and sol-gel-Applications of nano-materials.

Text Books:

1. Engineering Physics by K. Thygarajan, Mac Graw – Hill Publishing Co. New Delhi.
2. Engineering Physics by P.K. Palanisamy, Scitech Publications.
3. Engineering Physics by S. Mani Naidu, Pearson edition.

ReferenceBooks:

1. EngineeringPhysics-SanjayD.Jain,D.SahasrambudheandGirishUniversityPress,IEdition,2009.
2. EngineeringPhysics–DKPandey,S.Chaturvedi,CengageLearning,IEdition,2012
3. Engineeringphysics–M.N.AvadhanuluandP.G.KshirSagar,ChandandCo,RevisedEdition,2013.
4. SolidStatePhysics–A.J.Dekkar,McMillanPublishers,Latestedition,2012.
5. EngineeringPhysics–GaurandGuptaDhanapati,RaiPublishers,7th Edition,1992.
6. TextbookofNanoscienceandNanotechnology:BSMurthy,P.Shankar,BaldevRajBBRath,JamesMurday,UniversityPress,IEdition,2012.

Outcome:

- The different realms of physics and their applications in both scientific and technological systems are achieved through the study of physical optics, lasers and fibre optics.
- The important properties of crystals like the presence of long-range order and periodicity, structure determination using X-ray diffraction are focused along with ultrasonic non-destructive technique.
- The discrepancies between the classical estimates and laboratory observations of physical properties exhibited by materials would be lifted through the understanding of quantum picture of subatomic world.
- The electronic and magnetic properties of materials were successfully explained by free electron theory and focused on the basis for the band theory.
- The properties and device applications of semiconducting and magnetic materials are illustrated.
- The importance of superconducting materials and nanomaterials along with their engineering applications are well elucidated.

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1521202	BS	Mathematics-3	3	1	0	30	70	3

Objectives:

* This course aims at providing the students with the concepts of matrices and basics of linear algebra which will be useful in solving simultaneous linear equations.

* Our emphasis will be more on logical and problem solving development in Numerical methods and their applications in solving Engineering problems when analytical methods fails.

Unit I : Matrices: – Rank – Echelon form – Normal form – Solution of linear system of equations:Consistency and inconsistency - Gauss elimination method – Eigen values, eigen vectors for real matrices – Cayley- Hamilton theorem – Inverse and powers of a matrix. Linear transformations – Orthogonal transformations.

Unit II: Solution of algebraic and transcendental equations – Bisection method - False - position method - Newton - Raphson method. Solution of System of equations: Crout's method- Gauss Seidel iteration method.

Unit III: Interpolation – Finite differences - Forward differences - Backward differences - Newton's forward and backward difference formulae for interpolation - Lagrange's formula for unequal intervals- Inverse interpolation. Curve fitting: Method of least squares- Fitting of a straight line, second degree and exponential curves.

Unit IV: Numerical differentiation: Finding first and second order derivatives using Newton's formulae. Numerical integration: Newton - Cote's quadrature formulae - 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 modified method - Runge - Kutta methods of second and fourth order – Milne's predictor - corrector method.

Textbooks:

1. Higher Engineering Mathematics, Dr.B.S.Grewal, Khanna Publishers-42 edition.
2. Introductory methods of Numerical Analysis, S.SSastry, 5th edition.

References:

1. Engineering Mathematics – III B, Dr.M.KVenkata Raman, 13th edition.
2. Higher Engineering Mathematics, B.VRamana, Mc. Graw Hill Education(India) Pvt. Limited.
3. Numerical Methods, S. Arumugam, A.Thangapandi Isaac, A. Soma Sundaram, Second edition, Scitech Publications (India) Pvt. Limited.
4. Advanced Engineering Mathematics, Erwin Kreyszig, Willey Publications, 9th edition- 2013.

Outcomes:

- Students are able to understand and Applied Matrix theory in solving Engineering Problems.
- Students are able to understand and applied numerical methods in solving simultaneous equations and transcendental equations

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1523203	BS	Engineering Chemistry	3	1	0	30	70	3

Objectives:

- Knowledge in Chemistry serves as basic nutrient for the understanding and thereby design of materials of importance in life. Thus the advancement in Engineering depend on the outcome of basic sciences.
- The Engineering Chemistry course for undergraduate students is framed to strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial! Engineering applications.
- The course main aim is to impart in-depth knowledge of the subject and highlight the role of chemistry principles (or) applications in the field of engineering.
- An attempt has been made to logically correlate the topic with its application.

UNIT-I:

Water: Sources of water, types of impurities in water. Hardness of water: Causes, expression of hardness - units - Types of hardness-Temporary & permanent hardness of water. Disadvantages of hard water, Methods of treatment of water for domestic purpose Analysis of water : Hardness of water by EDTA method, Estimation of Dissolved oxygen by Winkler's method Numerical problems.

Boiler troubles - Scale &Sludge formation, caustic embrittlement, Boiler corrosion, priming &foaming.

Softening of water -Internal Treatment: phosphate,colloidal,calgon,carbonate and sodium aluminate treatment,External treatment : Zeolite, Ion exchange process. Reverse osmosis, electro dialysis.

UNIT -II:

Polymers: Introduction, Types of Polymerization, Mechanism (chain growth & Step growth). Plastics: Thermoplastic resins &Thermo set resins. Compounding of plastics, Preparation, properties, engineering applications of polyethylene, Bakelite, Nylon, Teflon. Elastomers-Natural rubber, vulcanization, Compounding of rubber,

Synthetic Rubbers :Buna-S, Butyl rubber and Thiokol Rubbers.

Inorganic Polymers : Basic introduction, Preparation, properties and engineering applications of Silicones, Polyphospazins(-(R)2-P=N-)

UNIT-III:

Electrochemistry: Basic concepts for construction of Electrochemical cells, Types of cells: Concentration cells, Galvanic cells. Electrochemical Series. Batteries- Primary (Laclanche cell) and Secondary Batteries (Lead acid cell) .Fuel cells-H_2-0_2fuel cell and methanol- oxygen fuel cells.

Corrosion- Introduction, Types and Mechanism of Corrosion(Wet and Dry corrosion), factors influence corrosion, Control of Corrosion- Cathodic Protection(Sacrificial anodic protection & impressed current cathodic protection). Basic principles of Electroplating, Electroless plating.

UNIT-IV:

Fuel technology:

Fuels: Classification, Characteristics of good fuel. Solid fuels: Manufacture of Metallurgical coke by Otto Hoffmann's by product oven process. Liquid fuels – petroleum crude - refining of petroleum. Synthetic petrol: Bergius and Fischer Tropsech's process, Calorific value of fuels: HCV, LCV, determination of Calorific value of solid fuels(Bomb calorimetry).

Lubricants: Functions of lubricant, mechanism of lubrication(thick film, thin film& extreme pressure lubrication). Properties of lubricants: Viscosity, Flash &fire point,Cloud and pour point, Aniline point.

UNIT- V:

Advanced Chemistry:

Green Chemistry: Introduction , Significance of green chemistry, 12 principles of Green chemistry. . Photo Chemistry: Introduction, Fluorescence, Phosphorescence, Luminiscent compounds, Solar cells Catalysis: Introduction, Types of Catalysis(Homogenous&Heterogenous catalysis) Action of catalyst (Catalytic promoters,Catalytic inhibitor and catalytic poisons) and applications of catalyst.

TEXTBOOKS

1 Text Book of Engineering Chemistry, Jain and Jain, DhanapathRai Publishing Company, New Delhi, 15th Edition, 2010.

2 Engineering Chemistry by Jayaveera, G.V. Subba Reddy, Tata McGraHill Publications, Edition 2013.

3 Text Book of Engineering Chemistry, Shashichawla, DhanapathRai Publications, New Delhi, 4th Edition, 2011.

4 Text Book of Engineering Chemistry by S.S. Dara&Mukkati S. Chand & Co Publishers, New Delhi, 2006.

REFERENCES

1. Text Book of Engineering Chemistry - C. Parameswara Murthy, C.V. Agarwal and Andra Naidu, BS Publications, Hyderabad, 3rd Edition, 2008.
2. Engineering Chemistry by K.B. Chandra Sekhar, UN. Das and Sujatha Mishra, SCITECH, Publications India Pvt. Limited, Chennai, 2nd Edition, 2012.
3. Chemistry of Engineering Materials by C.V. Agarwal, A. Naidu, BS publications.

EXPECTED OUTCOMES(EO) : The Student is expected to :

- Differentiate between hard and soft water.Understand the disadvantages of using hard water domestically and industrially. Select and apply suitable treatments domestically and industrially.
- Understand the electrochemical sources of energy
- Understand industrially based polymers,various engineering materials.

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1523204	HS	English-2	4	0	0	30	70	3

Objectives:

- To improve the language, proficiency of the students in English with an emphasis on LSRW Skills.
- To develop an awareness in the students about the significance of silent reading and comprehension.
- To equip the students to study academic subjects with greater facility through theoretical and practical components of the syllabus.
- To develop study skills as well as communication in formal and informal situations.
- To enable students to express themselves fluently and appropriately in social and professional contexts.
- To develop an awareness in the students about writing as an exact and formal skill.

UNIT – I

Phonetics & Transcription
Resume & Emails

UNIT – II

Dialogue Writing
Speech Making

UNIT – III

Paragraph Writing
Precis Writing

UNIT – IV

Group Discussion
Interviews

UNIT – V

Letter Writing
Technical Report Writing

Reference Books

1. Effective Technical Communication – M. Ashraf Rizvi, Tata McGraw-Hill
2. Speaking English Effectively – Krishna Mohan &N.P. Sing, Macmillan Publication
3. A Text Book of English Phonetics for Indian Students – T. Bala Subramanian, Trinity Press.
4. Communication with Confidence – Puspalatha, Oxford Publication
5. An approach to Communication Skills – DhanRajan
6. Business Correspondence and Report Writing – R.C. Sharma &Krishnamohan

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1505205	PJ	Introduction to Data Structures	3	1	0	30	70	3

Course Objectives:

- To understand the concept of pointers and files
- To understand dynamic memory allocation concepts
- To implement operations on linked lists
- To understand and implement various sorting and searching methods

UNIT-I

Pointers: Introduction, Understanding pointers, Accessing the address of a variable, Declaring pointer variable, Initialization of pointer variables, Accessing a variable through its pointer, Chain of pointers, Pointer Expressions, Pointers and Arrays, Array of pointers, Pointers to functions.

UNIT-II

File Management in C: Introduction, Defining and opening a file, Closing a file, Input/Output operations on files, Random access to files, Dynamic Memory Allocation: Introduction, Dynamic memory allocation, Memory allocation process, Allocating a block of memory: malloc, Allocating multiple blocks of memory: calloc, Releasing the used space: free, Altering the size of a block: realloc

UNIT-III

Concepts of ADTs: Data structures, Storage structures & File structures, Primitive & Non-primitive data structures, Linear &Non-linear data structures Linear Lists: ADT, Array & Linked representations, simulated pointers

UNIT-IV

Arrays : ADT, Mappings, Representations, Sparse Matrices, Linked Lists: : Single Linked Lists- Insertion, Deletion, Double Linked Lists- Insertion, Deletion, Circular Linked List, Garbage collection.

UNIT-V

Sorting: Selection, Insertion, Bubble, Merge, Quick, RadixSearching: Sequential & Binary Search.

TEXT BOOKS:

1. Programming ANSI C, E. Balaguruswamy, Fifth Edition, McGraw Hill (for Units I & II)
2. Fundamentals of Data Structures, Horowitz and Sahani, Galgotia publication
3. An Introduction to Data Structures with applications, Jean Paul Trembley and Paul G. Sorenson, McGraw Hill.

REFERENCE BOOKS:

1. C Programming & Data Structures, B.A. Fourouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. Data Structures using C, A.M.Tanenbaum, Y. Langsam and M.J. Augenstein, Pearson Education/PHI, Eigth Edition.
3. Data Structures Through C, G.S. Baluja, DhanpatRai& Co.
4. Programming in C and Data Structures, J.R. Hanly, Ashok N. Kamathane and A. AnandaRao, Pearson Education.
5. Data Structures and Program Design in C, R. Kruse etal, Pearson Education

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1525206	HS	Human Values and Professional Ethics	4	0	0	30	70	3

Course Objective:

• This course deals with professional ethics which includes moral issues and virtues, social responsibilities of an engineer, right qualities of moral leadership

UNIT - I : ENGINEERING ETHICS

Senses of Engineering Ethics – Variety of Moral issues – Types of inquiry – Moral Dilemmas – Moral Autonomy – Kohlberg's Theory – Consensus and Controversy – Professions and Professionalism – Professional ideals and virtues

UNIT – II : ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as experimentation – Engineers as Responsible Experimenters – Research Ethics – Codes of Ethics – Industrial Standards – A Balanced Outlook on Law – The Challenger Case Study

UNIT – III : ENGINEER'S RESPONSIBILITY FOR SAFETY

Safety and Risk – Assessment of Safety and Risk – Risk benefit Analysis – Reducing Risk – The Government Regulator's Approach to Risk – Chernobyl Case and Bhopal Case studies.

UNIT – IV : RESPONSIBILITIES AND RIGHTS

Collegiality and Loyalty – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property (IPR) – Discrimination.

UNIT – V : GLOBAL ISSUES

Multinational Corporations – Business Ethics – Environmental Ethics – Computer Ethics – Role in Technological Development – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Honesty – Leadership – Sample Code of conduct.

TEXT BOOKS :

1. Mike martin and Roland Schinzinger. " Ethics in Engineering '', McGrow Hill, New York 2005
2. Charles E Harris. Michael S Pritchard and Michael J Rabins." Engineering Ethics – Concepts and Cases ", Thompson Learning 2000.

REFERENCE BOOKS :

1. Charles D Fleddermann, " Engineering Ethics", Prentice Hall, New Mexico, 1999.
2. John R Baatright. "Ethics and the Conduct of Business", Pearson Education 2003.
3. Edmund G Seeabauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University press 2001.
4. Prof. (Col) P S Bajaj and Dr. Raj Agrawal, " Business Ethics – An Indian Perspective", Biztantra, New Delhi, 2004.
5. David Ermann and Michele S Shauf, " Computers, Ethics and Society", Oxford University Press, 2003

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1525207	HS	English Language and Communication Skills Lab	0	0	3	50	50	2

Objectives:

- To improve the language, proficiency of the students in English with an emphasis on LSRW Skills.
- To develop an awareness in the students about the significance of silent reading and comprehension.
- To equip the students to study academic subjects with greater facility through theoretical and practical components of the syllabus.
- To develop study skills as well as communication in formal and informal situations.
- To enable students to express themselves fluently and appropriately in social and professional contexts.
- To develop an awareness in the students about writing as an exact and formal skill.

LANGUAGE LAB

1. Phonetics
2. Situational Dialogues
3. Telephonic Skills
4. Describing Objects / Situation / People and Places
5. Information Transfer
6. Idioms

COMMUNICATION LAB

1. Introducing oneself
2. JAM Session
3. Extempore / Elocution
4. Role-play
5. Debate
6. Group Discussion

Suggested Software: Walden & K-Van Solutions

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1599208	BS	Physics and Chemistry Lab	0	0	3	50	50	2

PART A – ENGINEERING PHYSICS LAB

Objectives:-

- To explore the application of interference and diffraction by doing concerned experiments.
- To understand the role of laser in various applications.
- To know the significance of fiber parameters in communication application.
- To understand the concept of energy gap, Hall effect, B-H curve, X-ray diffraction and synthesis of nano material by performing the experiments.

LIST OF EXPERIMENTS

Any 7 of the following experiments has to be performed in a semester:

1. Determination of wavelengths of various colours of mercury spectrum using diffraction grating in normal incidence method.
2. Determination of dispersive power of the prism.
3. Determination of thickness of thin object by wedge method.
4. Determination of radius of curvature of lens by Newton's Rings.
5. Laser : Determination of wavelength using diffraction grating.
6. Determination of Numerical aperture and acceptance angle of an optical fiber.
7. Energy gap of a semiconductor using p-n junction diode.
8. Hall effect: Determination of mobility of charge carriers in semiconductor
9. Hysteresis: B-H curve
10. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
11. Determination of crystallite size using X-ray pattern (powder) by using Debye-Scherer method.
12. Synthesis of nanomaterials by any convenient method.

Outcomes:-

- Students can aware of the application of interference, diffraction phenomena along with laser.

The basic concept of fiber parameters, energy gap, Hall effect, B-H curve, X ray diffraction technique, along with synthesis of nano-materils can be elucidated by the students

PART B – ENGINEERING CHEMISTRY LAB

OBJECTIVES

- The objective of the course is that the student will have exposure to various experimental skills which is very essential for an Engineering student.
- The experiments are selected from various areas of Chemistry like Conductometry, Polymers, Energy sources and water.
- Also the student is exposed to various tools like Analytical Balance, pH meter, Viscometer, Bomb calorimeter, etc.

LIST OF EXPERIMENTS

Introduction to Lab - Analytical Balance, Molarity, Normality, Calculations, Glass wares. 1 Determination of total hardness of water by EDTA method.

2 Estimation of Dissolved Oxygen present in given water sample by Winkler's method
3 Determination of viscosity of oils by Redwood viscometer I.
4 Determination of viscosity of oils by Redwood viscometer II.
5 Determination of calorific value of fuel sample using Bomb Calorimetry.
6 Estimation of Iron by Diphenyl amine indicator.
7 Determination of Copper by EDT A method.
8 Conductometric titrations of Strong acid Vs Strong base((NaOH).
9. Colorimetric estimation of Manganese.
10. pHmeter calibration and measurement of pH of water and various other samples.

REFERENCES

1. Vogel's Text book of Quantitative Chemical Analysis, J. Mendham et.al., Pearson Education, Sixth Edition, 2012.
2. Laboratory manual on Engineering Chemistry, Anupama Rajput, DhanpatRai& Co Publications.
3. Essentials of Experimental Engineering Chemistry, Shashichawla, DhanpatRai& Co Publications.

OUTCOME

The student is expected to learn from this laboratory course the concept of error and its analysis. It also allows the student to develop experimental skills to design new experiments in Engineering. With the exposure to these experiments the student can compare the theory and correlate with experiment

III Sem

(1599301) ELECTRICAL AND ELECTRONICS ENGINEERING

L	T	C
4	0	3

Course Objectives:

- To understand electronic devices, including diodes, bipolar junction transistors and FET
- To study various Op-Amp applications

PART-A: ELECTRICAL ENGINEERING

UNIT I

Electrical Circuits: Basic concepts, Classification of elements, Kirchhoff's Laws, R-L-C Series, Parallel Circuits and Star – delta transformations.

UNIT II

DC Machines: Principle & Construction of DC Generator – EMF equation – Types. Principle of Operation of DC motor- Types – Torque Equation – Losses and Efficiency, Swinburne's Test and Load Test on D.C. Shunt Motor.

Transformers: Principle & Construction of single phase transformer –Types- EMF Equation- Equivalent circuit– Losses, Efficiency and Regulation (Definitions Only). OC and SC tests.

UNIT: III

AC Machines: Principle & Construction of Three Phase Induction Motor –Types, Slip – Torque Characteristics – Applications. Principle & Construction of Alternator –EMF equation- Regulation by synchronous impedance method.

TEXT BOOKS:

1. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiah, TMH Publication.
2. Basic Electrical Engineering by Kothari and Nagarath, TMH Publications, 2nd Edition.
3. Principles of Electrical and Electronics Engineering by V. K. Mehta, S. Chand & Co.

REFERENCE BOOKS:

1. Fundamentals of Electrical and Electronics Engineering by T. Thyagarajan, 5th Edition SCITECH Publications, 2007.

2. Fundamentals of Electrical Engineering and Technology by William D. Stanley, John R. Hackworth, Richard L Jones – Thomson Learning.

PART-B: ELECTRONICS ENGINEERING

UNIT-IV

Diode and its Characteristics: PN Junction diode, Symbol, V-I characteristics, Diode Applications, Rectifiers-Half Wave, Full Wave and Bridge Rectifiers (Simple Problems).

UNIT-V

Transistors: PNP and NPN Junction Transistor, Transistor as an Amplifier, Single Stage CE Amplifier, Frequency Response of CE Amplifier, Concepts of Feedback Amplifier, Necessary conditions for Oscillators, SCR Characteristics and Applications.

UNIT-V

Operational Amplifier: Ideal op-amp characteristics, Block diagram of Commercial IC Op-Amp, inverting and non-inverting modes of operation, voltage follower, summer, Subtractor.

TEXT BOOKS:

1. R.L.Boylestad and Louis Nashelsky, "Electronic devices and circuits", 9th Edition, 2006, PEI/PHI.
2. G.K.Mittal, "Industrial Electronics".
3. Albert D.Helfrick, Willam D.Cooper, "Modern Electronic Instrumentation and Measurement Techniques".PHI.
4. Morris Mano, "Digital Design", PHI.

REFERENCE BOOKS

1. Jacob Millman and C. Halkias, "Electronic devices and circuits", McGraw Hill.
   K. Lal Kishore, "Electronic Devices and Circuits", BSP. 2nd Edition, 2005

III Sem

(1505302) ADVANCED DATA STRUCTURES

L	T	C
3	1	3

Course Objectives:

- To develop skills to design and analyze linear and non linear data structures
- To develop algorithms for manipulating linked lists, stacks, queues, trees and graphs
- To develop recursive algorithms as they apply to trees and graphs.

UNIT-I

Overview of Data Structures, Stacks: Definition, ADT, Array & Linked representations, Operations & Applications, Queues: Definition, ADT, Array & Linked representations, Operations, Circular Queues, Dequeues.

UNIT-II

Trees: Basic terminology, **Binary Trees:** Definition, Properties, Representation, ADT, Complete Binary Tree, Full Binary Tree, **Tree Traversal Algorithm:** Inorder, Preorder and Postorder.

Priority Queues: Definition, ADT, Heaps – Introduction, Min-heap and Max-heap, Operations on heap, Heap sort.

UNIT-III

Binary Search Trees (BST): Definitions, ADT, Operations and Implementations, BST with Duplicates, Indexed BST, Balanced Search Trees: AVL, Red-Black & Splay Trees, **Graphs:** Terminology, Representations, **Graph Traversal:** Depth First Search (DFS) & Breadth First Search (BFS), Minimum Spanning Trees.

UNIT-IV

Directories, Linear List Representations, Skip List Representation, **Hashing:** Introduction, Hash Table, Hash Functions, **Collisions:** Introduction, Separate Chaining, Open Addressing.

UNIT-V

Multiway Search Trees and B-Trees: m-Way search Trees and its operations, B-Trees, Operations on B-Trees, B+-Trees.

TEXT BOOKS:

1. Data Structures and Algorithms in C++, S.Sahni, University Press (India) Private Limited, Second Edition.
2. An Introduction to Data Structures with applications, Jean Paul Trembley and Paul G.Sorenson, McGraw Hill.
3. Data Structures using C++, Varsha H.Patil, Oxfort University Press.

REFERENCE BOOKS:

1. Data Structures, Algorithms and Applications in C++, Ananda Rao Akepogu and Radhika Raju Palagiri, Pearson Education.
2. Data Structures, Seymour Lipschutz, Schaum's Outlines, McGraw Hill.
3. Data Structures and Algorithms, G.A.V.Pai, Tata McGraw Hill.
4. Data Structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
5. Data Structures and algorithms in C++, Mark Allen Weiss, Pearson Education Limited, Second Edition.

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III Sem

(1505303) DIGITAL LOGIC DESIGN

L	T	C
3	1	3

Course Objectives:

- Acquire the skills to manipulate and examine Boolean algebraic expressions,
- To understand the fundamental principles of digital design
- To acquaint with classical hardware design for both combinational and sequential logic
  circuits.

UNIT I

BINARY SYSTEMS: Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Binary codes, Binary Storage and Registers.

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, integrated circuits.

UNITII

OPTIMIZED IMPLEMENTATION OF LOGIC FUNCTION: The Karnaugh map method, minimization of Product of Sum forms, incompletely specified functions, Multi level NAND and NOR circuits, Exclusive – Or and Equivalence functions ,A tabular method for minimization.

UNIT III

COMBINATIONAL LOGIC: Combinational Circuits, Design procedure, Code converters, Binary parallel adder, Decimal Adder, Binary multiplier, Magnitude comparator, Decoders, demultiplexers, Encoders, Multiplexers, Read Only Memory (ROM), PLA.

UNIT IV

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

.**UNIT V**

REGISTERS AND COUNTERS: Registers, shift Registers, Ripple counters synchronous counters, Johnson counter

ASYNCHRONOUS SEQUENTIAL LOGIC: Introduction, Analysis of asynchronous sequential circuits, Synthesis of asynchronous sequential circuits, State Reduction , Hazards.

TEXT BOOKS:

1. Digital Design – Third edition, M.Morris Mano, Pearson Education/PHI.
2. Fundamentals of digital logic design with VHDL By Stephen Brown and I Zvonko Vranesic, second edition, The McGraw-Hill.
3. Fundamentals of logic design, Roth, 5th edition,Thomson.

REFERENCES:

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

III Sem

(1505304) DISCRETE MATHEMATICS

L	T	C
3	1	3

Course Objectives:

- To make the students learn logical thinking and be able to apply enumerating techniques.
- To develop an understanding of functions and relations.
- To enable the students understand graph theoretic techniques.

UNIT-I

Mathematical Logic: Introduction, Statements and notations, Connectives: Negation, Conjunction, Disjunction, Statement Formulas and Truth Tables, Conditional and Biconditional, Well formed formulas, Tautologies, Equivalence of Formulas, Tautological Implications.

Normal Forms: Disjunctive Normal Forms, Conjunctive Normal Forms, Principal Disjunctive Normal Forms, Principal Conjunctive Normal Forms, Ordering and Uniqueness of Normal Forms.

UNIT-II

Relations and Ordering: Relations, Properties of Binary Relations in a Set, Equivalence Relations, Compatibility Relations, Composition of Binary Relations, Partial Ordering, Partially Ordered Set: Representation and Associated Terminology.

Functions: Definition and Introduction, Composition of Function, Inverse Functions.

Recursion: Recursive Function, Sets, and Predicates.

Lattices as Partially Ordered Sets: Definition and Examples, Some Properties of Lattices.

UNIT-III

Algebraic Structures: Algebraic Systems: Examples and General Properties – Definition and Examples, Some Simple Algebraic Systems and General Properties.

Semi Groups and Monoids: Definition and Examples, Homomorphism of Semi groups and Monoids, Subsemigroups and Submonoids.

Groups: Definitions and Examples, Subgroups and Homomorphisms, Cosets and Lagrange's Theorem.

UNIT-IV

Elementary Combinatorics: Basis of counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations & Permutations, with repetitions, Enumerating Permutations with Constrained repetitions, Binomial Coefficients, The Binomial and Multinomial theorems, the principles of Inclusion – Exclusion.

UNIT-V

Graphs: Basic Concepts, Isomorphism and Sugraphs, Trees and their Properties, Spanning Trees, Directed Trees, Binary Trees, Planar Grpahs, Euler's Formula, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers, The Four-Colour Problem.

TEXT BOOKS:

1. Discrete mathematical stru ctures with applications to computer science - J P Tremblay and Manohar Mc Graw Hill
2. Discrete Mathematics for Computer Scientists & Mathematicians, 2/e, J.L.Mott, A. Kandel, T.P. Baker, PHI

REFERENCE BOOKS:

1. Elements of Discrete Mathematics- A Computer Oriented Approach,C.L.Liu, D.P. Mohapatra, 3/e,TMH.

2. Discrete and Combinatorial Mathematics- An Applied Introduction, Ralph. P.Grimaldi,
   5/e,Pearson Education.
3. Discrete Mathematics and its applications, 6th edition, K.H.Rosen, TMH.
4. Discrete Mathematical Structures, Mallik and Sen, Cengage Learning.
5. Discrete Mathematical Structures, Bernand Kolman, Robert C. Busby, Sharon Cutler Ross, PHI/ Pearson Education.
6. Discrete Mathematics with Applications,Thomas Koshy,Elsevier.
7. Discrete Mathematics, Lovasz, Springer.

III SEM

(1525305) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

L	T	C
4	0	3

Course Objectives:

1. To equip the budding engineering student with an understanding of concepts and tools of economic analysis.
2. Provide knowledge of managerial economics through differential economics concepts, accounting concepts are necessary to analyze and solve complex problems relating financial related matters in big industries.
3. An understanding of professional and ethical responsibility and ability to communicate effectively.
4. The broad education necessary to understand the impact of engineering solutions in a global and societal context.
5. Recognition of the need for, and an ability to engage in life-long learning and to meet contemporary issues.

UNIT I

MANAGERIAL ECONOMICS AND DEMAND ANALYSIS:

Definition, Nature and Scope of Managerial Economics- relation with other disciplines. Demand analysis – Determinants, Law of Demand and its exceptions – Elasticity of Demand – Types and Measurement of Elasticity of Demand – Methods of Demand Forecasting.

UNIT II

THEORY OF PRODUCTION AND COST ANALYSIS:

Production Function – Isoquants and Isocost, MRTS, least cost combination of inputs, Cobb- Douglas production function, laws of returns, internal and external economies of scale.

Cost Analysis: Cost concepts and classification. Break-Even Analysis (BEA), determination of Break Even Point – Managerial significance and limitation of BEA.

UNIT III

INTRODUCTION TO MARKET AND PRICING POLICIES:

Markets Structures: Types of competition, features of perfect competition, Monopoly, Monopolistic competition. Price- Output determination under perfect competition and monopoly – Methods of pricing – cost plus pricing, marginal cost, limit pricing, skimming pricing, bundling pricing, sealed bid pricing and peak load pricing.

UNIT – IV

BUSINESS ORGINATIONS AND CAPITAL BUDGETING:

Characteristic features of business, features of Sole Proprietorship, Partnership, Joint Stock Company and Public Enterprises. Changing business environment in post- liberalization scenario.

Capital: Significance, Types, Method and Sources and raising finance – Capital Budgeting Methods – Pay back Method, Accounting Rate of return (ARR) and Net Present Value Method (simple problems).

UNIT – V

FINANCIAL ACCOUNTING AND ANALYSIS:

Double Entry Book keeping, Journal, Ledger, Trail Balance – Final Accounts (Trading, Profit and loss Account and Balance sheet with simple adjustments) – Analysis and interpretation of financial statements through Liquidity, Profitability and Capital structure Ratios.

TEXT BOOKS:

1. Aryasri: Managerial Economics and Financial Analysis, 4/e, TMH, 2009.
2. Varshney & Maheswari: Managerial Economics, sultan chand, 2009.

REFERENCE BOOKS:

1. Premchand babu, Madan Mohan : Financial Accounting and Analysis, Himalaya,2009
2. Joseph G. Nellis and David parker: Principles of Business Economics, Pearson, 2/e, New Delhi.
3. M.Sugunatha Reddy: Managerial Economics and Financial Analysis, Research India Publication, New Delhi, 2013.

III Sem

(1505306) OBJECT ORIENTED PROGRAMMING THROUGH C++

L	T	C
3	1	3

Course Objectives:

- To make the students understand the features of object-oriented design and familiarize them with virtual functions, templates and exception handling.
- To enable the students solve various engineering problems in C++ programming language.

UNIT I

Principles of Object-Oriented Programming: Object-Oriented Programming Paradigm, Basic Concepts of Object-Oriented Programming, Benefits of OOP, Applications of OOP.

Beginning with C++: Comments, Output Operator, The iostream File, Variables, Input Operator, Cascading of I/O Operators, Structure of C++ program.

UNIT II

Tokens, Expressions and Control Structures: Tokens, Keywords, Identifiers and Constants, Basic Data Types, Declaration of variables, Dynamic initialization of variables, Reference variables, Operators in C++, Scope resolution operator, Memory management operators, Manipulators, Control Structures,

Functions in C++: Function Prototyping, Call by reference, Return by reference, Inline Functions, Function Overloading.

UNIT III

Classes and Objects: Specifying a Class, Defining Member Functions, Memory allocation for objects, Static data members, Static member functions, Arrays of objects, Friendly functions, **Constructors and Destructors:** Constructors, Parameterized constructors, Multiple constructors in a class, Constructors with default arguments, Copy constructor, Dynamic constructor, Destructors.

UNIT IV

Operator Overloading: Defining operator overloading, Overloading Unary operators, Overloading Binary operators, Overloading Binary operators using Friends.

Inheritance: Introduction, Single Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual base classes, Abstract classes.

UNIT V

Pointers, Virtual Functions and Polymorphism: this Pointer, Virtual Functions, Pure virtual functions.

Managing Console I/O Operations: Unformatted I/O operations, Formatted console I/O operations.

Templates: Class Templates, Function Templates, Overloading Template functions, Member function Templates.

Exception Handling: Basics of Exception handling, Exception handling mechanism.

TEXT BOOK:

1. The Complete Reference C++, Herbert Schildt, TMH 4th Edition.
2. Object Oriented Programming With C++, E. Balagurusamy, TMH 6th edition.
3.

REFERENCE BOOKS:

1. Object oriented programming with ANSI and TURBO C++, Ashok N Kamathane, Pearson education.
2. Object oriented programming with C++, Saurav Sahay, Oxford.
3. Learning C++ Programming :From Problem Analysis To Program Design, Malik, Thomson
4. Learning - Computer Science :A Structured Approach Using C++,2nd Ed., Forouzan, Thomson

III Sem

(1505307) OBJECT ORIENTED PROGRAMMING & DATA STRUCTURES LAB

L	P	C
0	3	2

Course Objective:

- To make the students learn the implementation of insertion, deletion and display operations on various linear and non-linear data structures.

The Student is expected to solve at least 10 experiments from covering 5 experiments from Object Oriented Programming and Data Structures courses each (every year 10 different experiments).

Sample List of Experiments from Objected Oriented Programming Course

1. Simple Programs without using Classes.
2. Programs using classes.
3. Programs using Constructor and Destructor.
4. Program illustrating Operator Overloading.
5. Program illustrating function overloading.
6. Program that the concepts of different forms of inheritance
7. Program that uses file concept.
9. Program that uses the concept of friend functions.
10. Program that uses concept of polymorphism.

Sample List of Experiments from Data Structure Course

1. Write a program to implement stack operation by using arrays.
2. Write a program to implement stack operation by using linked lists.
3. Write a program that uses stack operations to convert a given infix to postfix conversion.
4. Write a program that uses stack operations to evaluate postfix expression.
5. Write a program to implement queues operations by using arrays.
6. Write a program to implement queues operations by using linked lists.
7. Write a program to implement operations on circular queues by using arrays.
8. Write a program to implement operations on circular queues by using linked lists.
9. Write a program to implement operations on single linked list.
10. Write a program to implement operation on double linked list.
11. Write a program to implement insertion, deletion, and traversal operations on trees.
12. Write a program to implement the following graph traversal algorithms.
    (i) Depth first traversal (ii) Breadth first traversal
13. Write programs to sort list of elements using

(i) Selection sort (ii) Bubble soft (iii) Merge sort (iv) Quick sort

14. Write programs to implement the following searching techniques.
    (i) Linear search (ii) Binary search.

III Sem

(1599308) ELECTRICAL & ELECTRONICS ENGINEERING LAB

L	P	C
0	3	2

Course Objectives:

- To get exposed to the basic laws in circuit analysis
- To understand the operation of electrical machines
- To introduce the basic design concepts and conduct experiments on CRO, CDS, FG, half and full wave, transistor characteristics, shift registers, Summing and difference amplifiers.

PART – A ELECTRICAL LAB:

1. Verification of KCL and KVL.
2. Verification of Superposition theorem.
3. Verification of Thevenin's theorem.
4. Verification of Maximum power Transfer Theorem.
5. Load test on DC shunt motor.
6. OC & S.C Test on 1-Ø Transformer (Predetermination of efficiency and regulation at given power Factor)

PART – B- ELECTRICAL LAB:

1. V-I Characteristics of a PN – Junction diode.
2. V-I Characteristics of a Zener diode.
3. Input – output Characteristics of a BJT in CB Configuration.
4. Frequency response of CE amplifier.
5. Load Characteristics of Half wave rectifier with and without filter.
6. Op-amp non-inverting amplifier.

IV Sem

(1521401) PROBABILITY AND STATISTICS

L	T	C
4	0	3

Course Objective:

- 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

UNIT I

Random variables - Discrete random variables - Continuous random variables –Probability distribution function – Discrete and continuous probability distribution – Mathematical Expectation, Variance and standard deviation of probability distribution. Binomial , Poisson and Geometric distributions - Related properties.

UNIT II

Continuous distributions: Uniform – Exponential- Gamma – Normal – Log normal- Weibull distributions and 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 - Tests based on normal distribution –z -test for means and proportions. Small samples - t-test for one sample, two sample problem and paired t-test - F-test - Chi-square test (testing of goodness of fit and independence).

UNIT IV

Correlation and regression – Correlation – Co-efficient of correlation – lines of Regression- Relation between correlation and Regression co-efficients- rank correlation – Fitting of a straight line using the method of least squares - Multiple linear regression and its applications.

UNIT V

Statistical quality control: Concept of quality of a manufactured product - defect and defectives - Causes of variation - Random and assignable causes -The principle of Shewhart control chart – Charts for attributes and variable quality characteristics - Construction and operation of p-chart, c-chart, X-bar chart and R-chart.

TEXT BOOKS:

1. Higher Engineering Mathematics, Dr. B.SGrewal, Khanna Publishers-42 edition.

2. Walpole and Myrs, Probability & Statistics for Engineers & Scientists, Seventh edition, Pearson Education Asia, 2002,
3. Johnson, Probability & Statistics for Engineers, Fifth edition, Prentice Hall of India.

REFERENCE BOOKS:

1. Probability & Statistics by E. Rukmangadachari& E. Keshava Reddy Pearson Publisher
2. Statistical Methods by S.PGuptha, S Chand Publications.

IV Sem

(1505402) OPERATING SYSTEMS

L	T	C
4	0	3

Course Objectives:

- To have an overview of functions of operating systems.
- To know the components of an operating system.
- To have a thorough knowledge of process management.
- To have a thorough knowledge of storage management.
- To know the concepts of file systems

UNIT I

Operating Systems Basics: Operating systems functions, Overview of computer operating systems, distributed systems, operating system services and systems calls, system programs, operating system structure.

UNIT II

Process Management: Process concepts, scheduling-criteria, algorithms, their evaluation.

Concurrency: Process synchronization, the critical-section problem, Peterson's Solution, semaphores, classic problems of synchronization, monitors.

UNIT III

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement, algorithms, Allocation of frames.

UNIT IV

Deadlocks: system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock.

Files: The concept of a file, Access Methods, Directory structure, File system mounting, File sharing, protection.

UNIT V

Protection: Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix.

Security: The Security problem, program threats, user authentication.

TEXT BOOKS:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley.
2. Operating Systems, A Concept based Approach-D.M.Dhamdhere, Second Edition, TMH.

REFERENCE BOOKS:

1. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition–2009, Pearson Education.
2. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
3. Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.
4. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
5. Operating Systems, A.S.Godbole, Second Edition, TMH.
6. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
7. Operating Systems, G.Nutt, N.Chaki and S.Neogy, Third Edition, Pearson Education.
8. Operating Systems, R.Elmasri, A,G.Carrick and D.Levine, Mc Graw Hill

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IV Sem

(1505403) DATA BASE MANAGEMENT SYSTEMS

L	T	C
3	1	3

Course Objectives:

- To make the students confident in maintaining huge amounts of data by creating tables and accessing them.
- To apply concurrency control and recovery techniques during transaction execution.

UNIT I

Introduction - Database-System Applications, Purpose of Database Systems, View of Data, Database languages, Database Users and Administrators, History of Database Systems.

Introduction to the Relational Model - Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations.

Database Design and the E-R Model - Overview of the Design Process, The Entity-Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity-Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues, Extended E-R Features, Alternative Notations for Modeling Data.

UNIT II

Introduction to SQL - Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Sub queries, Modification of the Database .

Intermediate SQL - Transactions, Integrity Constraints, SQL Data Types and Schemas, Authorization

Advanced SQL - Functions and Procedures, Triggers.

Formal Relational Query Languages - The Relational Algebra, the Tuple Relational Calculus, the Domain Relational Calculus.

UNIT III

Schema Refinement and Normal Forms - Schema Refinement – Problems Caused by Redundancy, Decompositions, Problems related to decomposition. Reasoning about Functional Dependencies, First, Second, Third Normal forms, BCNF. Lossless join Decomposition, Dependency- preserving Decomposition. Schema refinement in Data base Design, Multi valued Dependencies, Fourth Normal Form, Join Dependencies, Fifth Normal Form, Inclusion Dependencies.

UNIT IV

Query Processing - Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation, Other Operations, Evaluation of Expressions

Query Optimization - Overview, Transformation of Relational Expressions, Estimating Statistics of Expression Results, Choice of Evaluation Plans.

Transactions - 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 .

UNIT V

Concurrency Control - Lock-Based Protocols, Deadlock Handling, Multiple Granularity, Timestamp-Based Protocols, Validation-Based Protocols, Multi version Schemes, Snapshot Isolation, Insert Operations, Delete Operations, and Predicate Reads, Weak Levels of Consistency in Practice.

Recovery System - Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Nonvolatile Storage, Early Lock Release and Logical Undo Operations, Remote Backup Systems.

TEXT BOOKS:

1. Silberschatz, Korth, *Database system Concepts*. 5th Edition, McGrawhill.
2. Raghurama Krishnan, Johannes Gehrke, *Data base Management Systems. 3rd Edition,* Tata McGrawHill.

REFERENCE BOOKS:

1. Elmasri, Navathe, *Fundamentals of Database Systems,* Pearson Education.
2. Peter Rob, Ananda Rao and Carlos Corone, *Database Management Systems,* Cengage Learning.
3. C.J.Date, *Introduction to Database Systems*, Pearson Education.

IV Sem

(1505404) FORMAL LANGUAGES AND AUTOMATA THEORY

L	T	C
3	1	3

Course Objectives:

- To be able to construct finite state machines and the equivalent regular expressions and prove the equivalence of languages described by finite state machines and regular expressions.
- To be able to construct pushdown automata and the equivalent context free grammars, Turing machines and Post machines.

UNIT I

Fundamentals: Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.

Finite Automata: NFA with Є transitions - Significance, acceptance of languages. Conversions and Equivalence : Equivalence between NFA with and without Є transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Mealy machines.

UNIT II

Regular Languages: Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets **(proofs not required).**

UNIT III

Grammar Formalism: Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms. Right most and leftmost derivation of strings.

Context Free Grammars: Ambiguity in context free grammars. Minimisation of Context Free Grammars. Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL **(proofs omitted).**

UNIT IV

Push Down Automata: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. **(Proofs not required)**. Introduction to DCFL and DPDA.

UNIT V

Turing Machine: Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required).

Computability Theory: Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of problems, Universal Turing Machine, undesirability of post's Correspondence problem, Turing reducibility, **Definition of P and NP problems, NP complete and NP hard problems.**

TEXT BOOKS:

1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J. D. Pearson Education.

2. Introduction to Theory of Computation - Sipser 2nd edition Thomson

REFERENCE BOOKS:

1. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.

2. Introduction to languages and the Theory of Computation ,John C Martin, TMH

3. "Elements of Theory of Computation", Lewis H.P. & Papadimition C.H. Pearson /PHI.

4 Theory of Computer Science and Automata languages and computation -Mishra and Chandrashekaran, 2nd edition, PHI.

5. Theory of Computation, By K.V.N. Sunitha and N.Kalyani

IV Sem

(1505405) JAVA PROGRAMMING

L	T	C
3	1	3

Course Objectives:

- To give the students a firm foundation on Java concepts like Primitive data types, Java control flow, Methods, Object-oriented programming, Core Java classes, packages and interfaces, multithreading.
- To provide the students with an understanding of Java applets, Abstract Window Toolkit and exception handling.

UNIT I

Object Oriented Programming basics: Need for OOP paradigm, summary of OOP concepts,

Java Basics: History of Java, Java buzzwords, Simple java program, classes and objects – concepts of classes, objects, constructors, methods, Introducing access control**, this** keyword, overloading methods and constructors.

UNIT II

Inheritance : Hierarchical abstractions, Base class object, subclass, subtype, benefits of inheritance, **supe**r uses, using **final** with inheritance, **polymorphis**m- method overriding, abstract classes.

Packages and Interfaces: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing

interface, applying interfaces, variables in interface and extending interfaces.

UNIT III

Exception handling and multithreading: Concepts of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, creating own exception sub classes. Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads.

UNIT IV

Event Handling : Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, The AWT class hierarchy, user interface components- labels, button, scrollbars, text components, check box, check box groups, choices, graphics, layout manager types – boarder, grid, flow, card and grid bag.

UNIT V

Applets : Concepts of Applets, differences between applets and applications, life cycle of an applet, creating applets, passing parameters to applets.

Swings : Introduction, JApplet, JFrame and JComponent, Icons and Labels, text fields, JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, and Tables.

TEXT BOOKS :

1. Java; the complete reference, 7th editon, Herbert schildt, TMH.

2. Understanding OOP with Java, updated edition, T. Budd, Pearson Education.

REFERENCE BOOKS:

1. An Introduction to programming and OO design using Java, J.Nino and F.A.Hosch, John wiley & sons.
2. An introduction to Java programming and object oriented application development, R.A. Johnson- Thomson.
3. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, eighth Edition, Pearson Education.
4. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, eighth Edition, Pearson Education
5. Object Oriented Programming through Java, P. Radha Krishna, University Press.
6. Java and Object Orientation, an introduction, John Hunt, second edition, Springer.

IV Sem

(1505406) COMPUTER ORGANIZATION

L	T	C
4	0	3

Course Objectives:

- To make the students understand the structure of computers and internal organization of
  different units like memory, I/O devices, registers.
- To study in detail the operation of arithmetic unit including the algorithms and implementation of fixed and floating point addition, subtraction, multiplication and division operations.

UNIT I

Basic concepts of computers: Computer Types, Functional units, Basic operational concepts, Bus Structures, Performance, Multiprocessors and multi computers, Data Representation- Fixed Point Representation, Floating – Point Representation.

UNIT II

Register Transfer: Register Transfer language, Register Transfer, Bus and memory transfers,

Micro operations : Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit, instruction codes, Computer instructions, memory – reference instructions , Input – Output and Interrupt, Addressing modes.

UNIT III

Micro programmed control: Control memory, Address sequencing, micro program example, design of control unit, Hard wired control, Micro programmed control.

Computer Arithmetic: Addition and subtraction, multiplication Algorithms, Division Algorithms.

UNIT IV:

Memory: Basic concepts, Cache memory, performance considerations, Virtual memory

Input-Output Organization: Peripheral Devices, Input- Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt, Direct memory Access.

UNIT V

Pipeline: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline.

Multiprocessors: Characteristics of Multiprocessors, Interconnection Structures, Interprocessor Arbitration, Inter Processor Communication and Synchronization.

TEXT BOOKS:

1. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.
2. Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson/PHI.

REFERENCE BOOKS:

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition, PHI/Pearson.
3. Fundamentals of Computer Organization and Design, - Sivaraama Dandamudi, Springer Int. Edition.
4. Computer Architecture a quantitative approach, John L. Hennessy and David A. Patterson, Fourth Edition, Elsevier.
5. Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.

IV Sem

(1505407) DATABASE MANAGEMENT SYSTEMS LAB

L	P	C
0	3	2

Course Objectives:

- To create database and query it using SQL queries and design forms using forms designer.
- To understand the significance of integrity constraints, referential integrity constraints, triggers, assertions.

Student is expected to implement at least 10 experiments from Database Management System Course covering various concepts (Every year 10 different experiments).

List of Sample Experiments:

1. Practicing DDL Commands

2. Practicing DML Commands.

3. Implementation of Aggregate operations

4. Implementation of special operators such as LIKE, BETWEEN, IN, EXISTS etc.

5. Implementation of SET operations (UNION, INTERSECTION, MINUS, JOIN etc)

6. Implementation of Oracle Functions

7. Creating Views, Updatable views

8. Creation of Triggers

9. Creation of Cursors

10. Writing sample programs in PL/SQL

IV Sem

(1505408) JAVA PROGRAMMING LAB

L	P	C
0	3	2

Course Objective:

- To be able to understand and implement Java applications and applets, Primitive data types, Java control flow, Methods, classes, packages, multithreading and exception handling.

Student is expected to implement at least 10 experiments from Java Programming Course covering various concepts (Every year 10 different experiments).

List of Sample Experiments:

1. Write a Java program that prints all real solutions to the quadratic equation . Read in a, b, c and use the quadratic formula. If the discriminant is negative, display a message stating that there are no real solutions.
2. Write a Java program that prints the Fibonacci series.
3. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
4. Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers
5. Write a Java program to multiply two given matrices.
6. Write a Java program that checks whether a given string is a palindrome or not.
7. Write a Java program for sorting a given list of names in ascending order.
8. Write a Java program to make frequency count of words in a given text.
9. Write a Java program to find the factorial of a given number using recursion
10. Write a Java program that reads a 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.
11. Write a Java program that implements stack ADT
12. Write a Java program that evaluates the postfix expression
13. Write a Java program to implement packages
14. Write a Java program to implement interfaces
15. Write a Java program to implement exception handling
16. Write a Java program to implement multithreading
17. Write a Java program to implement abstract methods and abstract classes
18. Write a Java program to develop an applet that displays a simple message

19. Write a Java program to 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.

20. Write a Java program for handling mouse events.

21. Write a Java program for handling keyboard events.

22. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.