Academic Regulations
Programme Structure
&
Detailed Syllabus

Bachelor of Technology
(B. Tech)
(Four Year Regular Programme)
(Applicable for Batches admitted from 2017-18)

Department of Computer Science and Engineering

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
Bachupally, Kukatpally, Hyderabad, Telangana, India
500 090

Academic Regulations
GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY, HYDERABAD
DEPARTMENT OF COMPUTER SCIENCEAND ENGINEERING (B. Tech)
GR17 REGULATIONS

Gokaraju Rangaraju Institute of Engineering and Technology 2017 Regulations (GR17 Regulations) are given hereunder. These regulations govern the programmes offered by the Department of Computer Science and Engineering with effect from the students admitted to the programmes in 2017-18 academic year.

1. **Programme Offered:** The programme offered by the Department is B.Tech in Computer Science and Engineering, a four-year regular programme.

2. **Medium of Instruction:** The medium of instruction (including examinations and reports) is English.

3. **Admissions:** Admission to the B.Tech in Computer Science and Engineering Programme shall be made subject to the eligibility, qualifications and specialization prescribed by the State Government/University from time to time. Admissions shall be made either on the basis of the merit rank obtained by the student in the common entrance examination conducted by the Government/University or on the basis of any other order of merit approved by the Government/University, subject to reservations as prescribed by the Government/University from time to time.

4. **Programme Pattern:**
a) Each Academic year of study is divided into two semesters.
b) Minimum number of instruction days in each semester is 90.
c) **Student is introduced to "Choice Based Credit System (CBCS)"**
d) **Grade points, based on percentage of marks awarded for each course will form the basis for calculation of SGPA (Semester Grade Point Average) and CGPA (Cumulative Grade Point Average).**
e) The total credits for the Programme is 192. Typically each semester has 24 credits.
f) **A student has a choice of registering for credits from the courses offered in the programme ensuring the total credits in a semester are between 20 and 28.**
g) **All the registered credits will be considered for the calculation of final CGPA.**
h) Each semester has - 'Continuous Internal Evaluation (CIE)' and 'Semester End Examination (SEE)'. Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) as indicated by UGC and course structure as suggested by AICTE are followed.
i) **Subject Course Classification** All subjects/ courses offered for the under graduate programme in E&T (B.Tech. degree programmes) are broadly classified as follows.

S. No.	Broad Course Classification	Course Group/ Category	Course Description
1	Foundation Courses (FnC)	BS – Basic Sciences	Includes mathematics, physics and chemistry subjects
2		ES - Engineering Sciences	Includes fundamental Engineering subjects
3		HS – Humanities and Social sciences	Includes subjects related to humanities, social sciences and management

4	Core Courses (CoC)	PC – Professional Core	Includes core subjects related to the parent discipline/ department/ branch of Engineering.
5	Elective Courses (EℓC)	PE – Professional Electives	Includes elective subjects related to the parent discipline/ department/ branch of Engineering.
6		OE – Open Electives	Elective subjects which include interdisciplinary subjects or subjects in an area outside the parent discipline/ department/ branch of Engineering.
7	Core Courses	Project Work	B.Tech. project or UG project or UG major project
8		Industrial training/ Mini- project	Industrial training/ Internship/ UG Mini-project/ Mini-project
9		Seminar	Seminar/ Colloquium based on core contents related to parent discipline/ department/ branch of Engineering.
10	Minor courses	-	1 or 2 Credit courses (subset of HS)
11	Mandatory Courses (MC)	-	Mandatory courses Credits/Marks are not counted for grading/pass percentage

5. **Award of B.Tech Degree:** A student will be declared eligible for the award of B. Tech Degree if he/she fulfills the following academic requirements:

a) He/She pursues the course of study and completes it successfully in not less than four academic years and not more than eight academic years.

b) A student has to register for all the 192 credits and secure all credits.

c) A student, who fails to fulfill all the academic requirements for the award of the degree within eight academic years from the date of admission, shall forfeit his/her seat in B.Tech course.

d) The Degree of B.Tech in Computer Science and Engineering shall be conferred by Jawaharlal Nehru Technological University Hyderabad (JNTUH), Hyderabad, on the students who are admitted to the programme and fulfill all the requirements for the award of the degree.

6. **Attendance Requirements**

a) A student shall be eligible to appear for the semester-end examinations if he/she puts in a minimum of 75% of attendance in aggregate in all the courses concerned in the semester.

b) Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in a semester may be granted. A committee headed by Dean (Academic Affairs) shall be the deciding authority for granting the condonation.

c) Students who have been granted condonation shall pay a fee as decided by the Academic Council.

d) Shortage of Attendance more than 10% (attendance less than 65% in aggregate) shall in no case be condoned.

e) Students whose shortage of attendance is not condoned in any semester are attained and are not eligible to take their end examinations of that semester. They may seek re-registration for that semester when offered next with the academic regulations of the batch into which he/she gets re-registered.

7. **Paper Setting, Evaluation of Answer Scripts, Marks and Assessment**

a) Paper setting and evaluation of the answer scripts shall be done as per the procedures laid down by the Academic Council from time to time.

b) Distribution and Weightage of marks

S. No	Components	Internal	External	Total
1	Theory	30	70	100
2	Practical	25	50	75
3	Engineering Graphics	30	70	100
4	Industry Oriented Mini Project	25	50	75
5	Comprehensive Viva	-	100	100
6	Seminar	50	-	50
7	Major Project	50	150	200

c) **Continuous Internal Evaluation and Semester End Examinations:** The assessment of the student's performance in each course will be based on Continuous Internal Evaluation (CIE) and Semester-End Examination (SEE). The marks for each of the component of assessment are fixed as shown in the following Table.

Assessment Procedure:

S.No	Component of Assessment	Marks Allotted	Type of Assessment	Scheme of Examinations
1	Theory	30	Internal Exams & Continuous Evaluation	1) Two mid semester examinations shall be conducted for 20 marks each for a duration of 2 hours. Average of the two mid exams shall be considered **i) Subjective - 15 marks** **ii) Objective - 5 marks** **2) Tutorials - 5 marks** **3) Continuous Assessment – 5 marks**
		70	Semester-end examination	The semester-end examination is for a duration of 3 hours
2	Practical	25	Internal Exams & Continuous Evaluation	**i) Internal Exam-10 marks** **ii) Record - 5 marks** **iii) Continuous Assessment - 10 marks**
		50	Semester-end examination	The semester-end examination is for a duration of 3 hours

d) **Industry Oriented Mini Project:** The Mini Project is to be taken up with relevance to Industry and is evaluated for 75 marks. Out of 75 marks, 25 marks are for internal evaluation and 50 marks are for external evaluation. The supervisor continuously assesses the students for 15 marks (Continuous Assessment –10

marks, Report – 5 marks). At the end of the semester, Mini Project shall be displayed in the road show at the department level for the benefit of all students and staff and the same is to be evaluated by Mini Project Review Committee for 10 marks. The mini project report shall be presented before Project Review Committee in the presence of External Examiner and the same is evaluated for 50 marks. Mini Project Review Committee consists of HOD, Mini Project Coordinator and Supervisor.

e) **Comprehensive Viva:** The comprehensive viva shall be conducted by a Committee consisting of HOD and two senior faculty members of the department. The student shall be assessed for his/her understanding of various courses studied during the programme of study. The Viva-voce shall be evaluated for 100 marks.

f) Seminar: For the seminar, the student shall collect information on a specialized topic and prepare a technical report and present the same to a Committee consisting of HOD and two senior faculty and the seminar coordinator of the department. The student shall be assessed for his/her understanding of the topic, its application and its relation with various courses studied during the programme of studyfor**50 marks.**

g) **Major Project:** The project work is evaluated for 200 marks. Out of 200, 50 marks shall be for internal evaluation and 150 marks for the external evaluation. The supervisor assesses the student for 25 marks (Continuous Assessment – 15 marks, Report – 10 marks). At the end of the semester, projects shall be displayed in the road show at the department level for the benefit of all students and staff and the same is to be evaluated by the Project Review Committee for 25 marks. The external evaluation for Project Work is a Viva-Voce Examination which is conducted by the Project Review Committee in the presence of external examiner and is evaluated for 150 marks, Project Review Committee consists of HOD, Project Coordinator and Supervisor.

h) Engineering Graphics:

- Two internal examinations, each is of 10 marks .The average of the two internal tests shall be considered for the award of marks.

- Submission of day to day work - 15 marks.

- Continuous Assessment - 5 marks.

8. **Recounting of Marks in the End Examination Answer Books:** A student can request for re-counting of his/her answer book on payment of a prescribed fee.

9. **Re-evaluation of the End Examination Answer Books:** A student can request for re-evaluation of his/her answer book on payment of a prescribed fee.

10. **Supplementary Examinations:** A student who has failed to secure the required credits can appear for a supplementary examination, as per the schedule announced by the College.

11. **Malpractices in Examinations:** Disciplinary action shall be taken in case of malpractices during Mid/ End-examinations as per the rules framed by the Academic Council.

12. Academic Requirements and Promotion Rules:

a) A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or laboratories if he / she secures not less than 35% of marks in the Semester-end Examination and a minimum of 40% of the sum total of the Internal Evaluation and Semester-end examination taken together.

b) A student shall be promoted to the next semester only when he/she satisfies the requirements of all the previous semesters.

S. No.	Promotion	Conditions to be fulfilled	
1	**First year first semester to first year second semester**	**Regular course of study of first year first semester.**	
2	**First year second semester to second year first semester**	**(i)**	**Regular course of study of first year second semester.**
		(ii)	**Must have secured at least 24 credits**

		out of 48 credits i.e., 50% credits up to first year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3	**Second year first semester to second year second semester**	**Regular course of study of second year first semester.**
4	**Second year second semester to third year first semester**	**(i) Regular course of study of second year second semester.** **(ii) Must have secured at least 58 credits out of 96 credits i.e., 60% credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.**
5	**Third year first semester to third year second semester**	**Regular course of study of third year first semester.**
6	**Third year second semester to fourth year first semester**	**(i) Regular course of study of third year second semester.** **(ii) Must have secured at least 86 credits out of 144 credits i.e., 60% credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.**
7	**Fourth year first semester to fourth year second semester**	**Regular course of study of fourth year first semester.**

13. **Grade Points: A 10- point grading system with corresponding letter grades and percentage of marks, as given below, is followed**

Letter Grade	Grade Point	Percentage of marks
O (Outstanding)	10	Marks>=90
A+ (Excellent)	9	Marks>=80 and Marks < 90
A (Very Good)	8	Marks>=70 and Marks < 80
B+ (Good)	7	Marks>=60and Marks < 70
B (Average)	6	Marks>=50 and Marks < 60
C (Pass)	5	Marks>=40and Marks < 50
F (Fail)	0	Marks < 40
Ab (Absent)	0	-

Earning of Credit:

A student shall be considered to have completed a course successfully and earned the credits if he/she secures an acceptable letter grade in the range O-P. Letter grade 'F' in any Course implies failure of the student in that course and no credits earned.

Computation of SGPA and CGPA:

The UGC recommends the following procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

i) S_k the SGPA of kth semester(1 to 8)is the ratio of sum of the product of the number of credits and grade points to the total credits of all courses registered by a student, i.e.,

$$\text{SGPA } (S_k) = \sum_{i=1}^{n} (C_i * G_i) / \sum_{i=1}^{n} C_i$$

Where C_i is the number of credits of the ith course and G_i is the grade point scored by the student in the ith course and n is the number of courses registered in that semester.

ii) The CGPA is calculated in the same manner taking into account all the courses m, registered by student over all the semesters of a programme, i.e., upto and inclusive of S_k, where $k \geq 2$.

$$\text{CGPA} = \sum_{i=1}^{m} (*G_i) / \sum_{i=1}^{m} C_i$$

iii) The SGPA and CGPA shall be rounded off to 2 decimal points.

14. **Award of Class:** After a student satisfies all the requirements prescribed for the completion of the Degree and becomes eligible for the award of B. Tech Degree by JNTUH, he/she shall be placed in one of the following four classes based on CGPA secured from the 192 credits.

	Class Awarded	CGPA Secured
14.1	First Class With Distinction	CGPA $\geq$ 8.00 with no F or below grade/ detention anytime during the programme
14.2	First Class	CGPA $\geq$ 8.00 with rest of the clauses of 13.1 not satisfied
14.3	First Class	CGPA $\geq$ 6.50 and CGPA < 8.00
14.4	Second Class	CGPA $\geq$ 5.50 and CGPA < 6.50
14.5	Pass Class	CGPA $\geq$ 5.00 and CGPA < 5.50

15. **Withholding of Results:** If the student has not paid dues to the Institute/ University, or if any case of indiscipline is pending against the student, the result of the student (for that Semester) may be withheld and the student will not be allowed to go into the next semester. The award or issue of the Degree may also be withheld in such cases

16. **Transfer of students from the Constituent Colleges of JNTUH or from other Colleges/ Universities:** Transfer of students from the Constituent Colleges of JNTUH or from other Colleges/ Universities shall be considered only on case-to-case basis by the Academic Council of the Institute.

17. **Transitory Regulations:** Students who have discontinued or have been detained for want of attendance, or who have failed after having undergone the Degree Programme, may be considered eligible for readmission/re-registration to the same or equivalent subjects as and when they are offered.

18. **General Rules**

a) The academic regulations should be read as a whole for the purpose of any interpretation.

b) In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the

Academic Council is final.

c) In case of any error in the above rules and regulations, the decision of the Academic Council is final.

d) The college may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the college.

Academic Regulations for B.Tech (Lateral Entry) under GR17
(Applicable for Batches Admitted from 2018-19)

1. **All regulations as applicable for B.Tech Four year degree programme (Regular) will hold good for B.Tech (Lateral Entry Scheme) except for the following rules**
   a) Pursued programme of study for not less than three academic years and not more than six academic years.
   b) A student should register for all 144 credits and secure all credits. The marks obtained in all 144 credits shall be considered for the calculation of the final CGPA.
   c) Students who fail to fulfil all the academic requirements for the award of the degree within six academic years from the year of their admission, shall forfeit their seat in B.Tech programme.

2. Academic Requirements and Promotion Rules:

a) A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or laboratories if he / she secures not less than 35% of marks in the Semester-end Examination and a minimum of 40% of the sum total of the Internal Evaluation and Semester-end examination taken together.

b) A student shall be promoted to the next semester only when he/she satisfies the requirements of all the previous semesters.

S. No.	Promotion	Conditions to be fulfilled
1	**Second year first semester to second year second semester.**	**Regular course of study of second year first semester.**
2	**Second year second semester to third year first semester.**	**(i) Regular course of study of second year second semester.** **(ii) Must have secured at least 29 credits out of 48 credits i.e., 60% credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.**
3	**Third year first semester to third year second semester.**	**Regular course of study of third year first semester.**
4	**Third year second semester to fourth year first semester.**	**(i) Regular course of study of third year second semester.** **(ii) Must have secured at least 58 credits out of 96 credits i.e., 60% credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.**

5	Fourth year first semester to fourth year second semester.	Regular course of study of fourth year first semester.

3. Award of Class: After a student satisfies all the requirements prescribed for the completion of the Degree and becomes eligible for the award of B. Tech Degree by JNTUH, he/she shall be placed in one of the following four classes based on CGPA secured from the 144 credits.

	Class Awarded	CGPA Secured
3.1	First Class With Distinction	CGPA $\geq$ 8.00 with no F or below grade/ detention anytime during the programme
3.2	First Class	CGPA $\geq$ 8.00 with rest of the clauses of 3.1 not satisfied
3.3	First Class	CGPA $\geq$ 6.50 and CGPA < 8.00
3.4	Second Class	CGPA $\geq$ 5.50 and CGPA < 6.50
3.5	Pass Class	CGPA $\geq$ 5.00 and CGPA < 5.50

CSE I B.Tech   I semester

Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Internal Marks	External Marks	Total Marks
			L	T	P					
BS	GR17A1001	Linear Algebra and Single Variable Calculus	2	1		3	4	30	70	100
BS	GR17A1002	Advanced Calculus	2	1		3	4	30	70	100
BS	GR17A1007	Engineering Physics	2	1		3	4	30	70	100
ES	GR17A1009	Computer Programming	2	1		3	4	30	70	100
HS	GR17A1005	English	2	1		3	4	30	70	100
ES	GR17A1019	Fundamentals of Electronics Engineering	2	1		3	4	30	70	100
ES	GR17A1025	Engineering Workshop			2	2	4	25	50	75
ES	GR17A1027	Computer Programming lab			2	2	4	25	50	75
BS	GR17A1029	Engineering Physics lab			2	2	4	25	50	75
		TOTAL	**12**	**6**	**6**	**24**	**36**	**255**	**570**	**825**

Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Internal Marks	External Marks	Total Marks
			L	T	P					
BS	GR17A1003	Transform Calculus and Fourier Series	2	1		3	4	30	70	100
BS	GR17A1004	Numerical Methods	2	1		3	4	30	70	100
BS	GR17A1008	Engineering Chemistry	2	1		3	4	30	70	100
ES	GR17A1010	Data Structures	2	1		3	4	30	70	100
ES	GR17A1023	Engineering Graphics	1		2	3	5	30	70	100
ES	GR17A1018	Basic Electrical Engineering	2	1		3	4	30	70	100
HS	GR17A1024	Business Communication and Soft Skills			2	2	4	25	50	75
ES	GR17A1026	IT Workshop			2	2	4	25	50	75
BS	GR17A1030	Engineering Chemistry lab			2	2	4	25	50	75
		TOTAL	**11**	**5**	**8**	**24**	**37**	**255**	**570**	**825**

CSE   II. B.Tech   **I-SEMESTER**

Group	Subject code	Name of subject	Credits			Total credits	Hours			Total Hours	Total Marks
			L	T	P		L	T	P		
BS	GR17A2011	Probability and Statistics	2	1		3	2	2		4	100
PC	GR17A2062	Mathematical Foundation of Computer Science	2	1		3	2	2		4	100
PC	GR17A2063	Database Management Systems	3	1		4	3	2		5	100
PC	GR17A2064	Advanced Datastructures through C++	3	1		4	3	2		5	100
PC	GR17A2065	Digital Logic Design	3	1		4	3	2		5	100
PC	GR17A2066	Advanced Datastructures through C++ Lab			2	2			4	4	75
PC	GR17A2067	Databases Lab			2	2			4	4	75
PC	GR17A2068	Digital Logic Design Lab			2	2			4	4	75
		Total credits/Hours/Marks	**13**	**5**	**6**	**24**	**13**	**10**	**12**	**35**	**725**
MC	GR17A2001	Environmental Science			2	2			4	4	100

CSE   II. B.Tech   **II-SEMESTER**

Group	Subject code	Name of subject	Credits			Total credits	Hours			Total Hours	Total Marks
			L	T	P		L	T	P		
HS	GR17A2104	Managerial Economics and Financial Analysis	2	1		3	2	2		4	100
PC	GR17A2069	Operating Systems	3	1		4	3	2		5	100
PC	GR17A2070	Object Oriented Programming through Java	3	1		4	3	2		5	100
PC	GR17A2071	Formal Languages and Automata Theory	3	1		4	3	2		5	100
PC	GR17A2076	Computer Organization	2	1		3	2	2		4	100
PC	GR17A2072	Object Oriented Programming through Java Lab			2	2			4	4	75
PC	GR17A2073	Operating Systems Lab			2	2			4	4	75
PC	GR17A2074	Advanced Databases Lab			2	2			4	4	75
		Total credits/Hours/Marks	**13**	**5**	**6**	**24**	**13**	**10**	**12**	**35**	**725**
MC	GR17A2002	Value Education and Ethics			2	2			2	2	100
MC	GR17A2106	Gender sensitization Lab			2	2			2	2	75

I YEAR I SEMESTER

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
LINEAR ALGEBRA AND SINGLE VARIABLE CALCULUS

Course Code: GR17A1001   **L: 2 T: 1 P: 0 C: 3**
 Prerequisites: Vector algebra, Matrix algebra and Pre-calculus

Unit-I

Linear Algebra and Matrix eigen value problem: Rank of a matrix, Normal form, Consistency of a system of linear equations-Rank-Nullitytheorem, Pseudo inverse of a matrix-Condition number of a matrix-Norm of matrix,Approximate solution of an over determined system of linear equations using the pseudoinverse-Moore penrose method, -Solution of a system of homogeneous linear equations.
Vector norms, Linear dependence and independence of vectors, Gram-Schmidt Orthogonalization of vectors, Matrix norms, Cayley Hamilton theorem determination of Eigen values and Eigen vectors of a square matrix-Properties of Eigen values and Eigen vectors of real and complex matrices
Unit-II

Matrix factorization and Quadratic Forms: Diagonalization of a matrix- Orthogonal diagonalization of symmetric matrices-Computation of matrix powers- -Singular value decomposition - QR factorization Quadratic forms-Definiteness of a quadratic form-Rank, index and signature of a quadratic form- Reduction of a quadratic form into a canonical form by an orthogonal transformation
Unit-III

Differential Calculus of functions of a single variable: Mean value theorems (Rolles', Lagrange's, Cauchy's, Taylor's and Maclaurin's theorems Geometrical Interpretation without proof) –L – Hospital rule , Hessian matrix . Approximation of functions by Taylor's and Maclaurin's theorems-Series expansion of functions, Power series representation total derivative; Tangent plane and normal line
Unit-IV

Linear differential equations of the first order and their applications: Formation of ODE-Methods to solve first order LDE (exact, reducible to exact, linear and Bernoulli equations)Applications-Growth and decay models-Newton's law of cooling- Applications to electrical circuits (LR and RC circuits)-Geometrical applications-Orthogonal trajectoriessolvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

Unit-V

Linear differential equations of the higher order and applications: Equations with constant coefficients-Particular integrals for functions of the type - - Exponential shift - Method of variation of parameters. CauchyEuler equation; Power series solutions; Legendre polynomials, Bessel functions of the first kind and their properties
Applications-Deflection of beams, Simple harmonic motion (simple pendulum, spring-masssystems) and RLC circuits

Text Books
1. Advanced Engineering Mathematics: R.K.Jain and S.R.K.Iyengar- Narosa Publishing House
2. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.
3. Higher Engineering Mathematics: B.S.Grewal-Khanna Publications.

References Books
1. Introduction to Linear Algebra-Gilbert Strang
2. Schaum's outline series on Linear Algebra
3. GRIET reference manual

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
ADVANCED CALCULUS

Course Code: GR17A1002   **L:2 T:1 P:0 C:3**

Prerequisites: Analytical 2-D and 3-D geometry, differential and integral calculus

Unit-I

Differential Calculus of functions of several variables and Function Optimization:
Partial differentiation – Visualization of partial derivatives - Hessian matrix-Total
differentiation-Jacobian and its utility

Optimization of functions of several variables without constraints- Constrained
optimization of functions of several variables with one or more equality constraints-The
Lagrange's multiplier method

Unit-II

Curve tracing principles and Applications of integration: Basic principles of tracing
Cartesian, polar and parametric curves -Applications of the definite integral to evaluate arc
lengths, surface areas of revolution and volumes of revolution

Unit-III

Multiple integrals and applications: Evaluation of Double integrals in Cartesian and
polar coordinates-Changing the order of integration- Change of variables - Evaluation of
triple integrals in Cartesian, cylindrical and spherical polar coordinates

Application of multiple integrals to evaluate plane areas and volumes of solids

Unit-IV

Vector Calculus: Vector differentiation in Cartesian coordinates-Gradient, Divergence and
Curl and their physical interpretation-Directional derivatives-Angle between surfaces,
Vector Identities, Irrotational fields and scalar potentials
Vector integration-Evaluation of line integrals-Work done by conservative fields-Surface
integrals

Unit-V

Vector Field theorems: Green's theorem in the plane-Divergence theorem of Gauss-
Stoke's theorem (Without Proofs)

Text Books
1. Advanced Engineering Mathematics: R.K.Jain and S.R.K.IyengarNarosa Publishing House
2. Schaum's outline series on Vector Analysis

3. Higher Engineering Mathematics: B.S.Grewal-Khanna Publications

Reference Books
1. Advanced Engineering Mathematics: Erwin Kreyszig-Wiley

2. Calculus and Analytical Geometry-Thomas & Finney-Narosa

3. GRIET Reference Manual.

ENGINEERING PHYSICS

Course Code: GR17A1007   **L:2 T:1 P:0 C:3**
Prerequisites: Fundamentals in Physics and Mathematics.

UNIT-I
Crystal Structures: Lattice points, Space lattice, Basis, Bravais lattice, unit cell and lattice parameters, Seven Crystal Systems with 14 Bravais lattices , Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC, Miller Indices, Inter planer spacing of Cubic crystal system.
Defects in Crystals: Classification of defects, Point Defects: Vacancies, Substitution, Interstitial, Concentration of Vacancies, Frenkel and Schottky Defects, Edge and Screw Dislocations (Qualitative treatment), Burger's Vector, Overview of Surface and Volume defects.
Principles of Quantum Mechanics: Waves and Particles, de Broglie Hypothesis, Matter Waves, Davisson and Germer's Experiment, Heisenberg's Uncertainty Principle, Schrodinger's Time Independent Wave Equation-Physical Significance of the wave Function-Particle in One Dimensional Potential Box.

UNIT –II
Electron Theory of Metals: Classical free electron theory, Derivation of Ohm's law, Mean free path, Relaxation time and Drift velocity, Failures of Classical free electron theory, Quantum free electron theory, Fermi-Dirac distribution, Fermi energy, Failures of Quantum free electron theory.
Band Theory of Solids: Electron in a periodic potential, Bloch Theorem, Kronig-Penny Model(Qualitative Treatment), origin of Energy Band Formation in Solids, Classification of Materials into Conductors, Semi-Conductors & Insulators, Effective mass of an Electron.
Semiconductor Physics: Intrinsic Semiconductors and Carrier Concentration, Extrinsic Semiconductors and Carrier Concentration, Fermi Level in Intrinsic and Extrinsic Semiconductors, Hall Effect and Applications.

UNIT – III
Dielectric Properties: Electric Dipole, Dipole Moment, Dielectric Constant, Polarizability, Electric Susceptibility, Displacement Vector, Types of polarization: Electronic, Ionic and Orientation Polarizations and Calculation of Polarizabilities (Electronic & Ionic) -Internal Fields in Solids, Clausius -Mossotti Equation, Piezo-electricity, Pyro-electricity and Ferro- electricity.
Magnetic Properties: Magnetic Permeability, Magnetic Field Intensity, Magnetic Field Induction, Intensity of Magnetization, Magnetic Susceptibility, Magnetic Flux, Origin of Magnetic Moment, Bohr Magnetron, Classification of Dia, Para and Ferro Magnetic Materials on the basis of Magnetic Moment, Hysteresis Curve on the basis of Domain Theory of Ferro Magnetism, Soft and Hard Magnetic Materials,   Anti-Ferro, Ferrites and their Applications.

UNIT – IV
Lasers: Characteristics of Lasers, Spontaneous and Stimulated Emission of Radiation, Meta-stable State, Population Inversion, Pumping mechanisms, Optical Feedback, Resonator, Characteristics of Laser, Einstein's Coefficients and Relation between them, Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers.
Fiber Optics: Structure and Principle of Optical Fiber, Acceptance Angle, Numerical Aperture, Types of Optical Fibers (SMSI, MMSI, MMGI), Skew rays and Meridional rays, Attenuation in Optical Fibers: Scattering losses, absorption losses and bending losses, Application of Optical Fibers, Optical fiber Communication Link with block diagram.

UNIT –V
Nanotechnology: Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Bottom-up Fabrication: Sol-gel Process, Electrodeposition, Top-down Fabrication: Ball milling, Chemical Vapor Deposition, Physical, Chemical and Optical properties of Nano materials, Characterization (SEM, EDAX), Applications.

Text Books

1. **Engineering Physics:** P. K. Palanisamy, Scitech Publishers.
2. **Engineering Physics:** S. O. Pillai, New age International.
3. **Applied Physics:** T. Bhima Sankaram, G Prasad, BS Publications

Reference Books

1. **Solid State Physics:** Charles Kittel, Wiley & Sons (Asia) Pte Ltd.
2. **Fundamentals of physics:** Halliday, Resnick, Walker.
3. **Optical Electronics:** A.J Ghatak and K.Thyagarajan, Cambridge University Press.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
COMPUTER PROGRAMMING

Course Code: GR17A1009   **L:2 T:1 P:0 C:3**

Prerequisites: Knowledge of Mathematics required

Unit-I
Introduction to Computers: Computer Hardware and Software, System Software, Programming Languages, Program Development steps, Algorithms, Flowcharts.

Introduction to C: History of C, Structure of C-Program, Keywords, Identifiers, Data types, Constants, Variables, Operators, Expressions, Precedence and order of evaluation, Type Conversion and Type Casting .

Unit-II
Managing I/O: Input-Output statements, Formatted I/O.
Decision making statements: if, if-else, if-else-if, nested if, switch
Iterative Statements: while, do- while, for**.**
Unconditional statements: break, continue, goto.

Unit-III
Arrays: Introduction, One-Dimensional arrays, Declaring and Initializing arrays, Multi-dimensional arrays
Strings: Introduction to Strings, String operations with and without using String Handling functions, Array of strings.

Unit-IV
Functions: Introduction, Function definition, Function declaration, Function Calls, Return values and their types, Categories of Functions, Nested Functions, Recursion, Storage Classes, Passing arrays to Functions.
Pointers: Pointers and addresses, Pointer expressions and Pointer arithmetic, Pointers and Functions, void pointer, Pointers and Arrays, Pointers and Strings, Array of pointers, Pointers to Pointers.
Dynamic memory allocation: malloc, calloc, realloc, free.

Unit-V
Structures: Basics of Structures, Nested Structures, Arrays of Structures, Arrays within Structures, Structures and Functions, Pointers and Structures, Self-referential Structures, Unions.
Files: Introduction, Types of Files, File Access Functions, I/O on Files, Random Access to Files, Error Handling, Command Line Arguments.

Text Books
1. The C Programming Language, BRIAN W. KERNIGHAN Dennis M.Ritchie, Second Edition, PHI.
2. Computer Programming and Data structures by E Balaguruswamy, published by McGrawHill.

3. Programming in C, Ashok N Kamthane, 2nd edition, Pearson Publication.

Reference Books

1. Programming in C, PradipDey, Manas Ghosh, Second Edition, Oxford University Press.
2. Let Us C, Yashwanth Kanetkar, 10th Edition, BPB Publications.
3. C& Data structures, P.Padmanabham, B.S. Publications.
4. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
5. Programming with problem solving, J.A.Jones & K.Harrow, Dreamtech Press.
6. Programming in C, Stephen G.Kochan, III Edition, Pearson Education.
7. Problem solving and program design in C, Jeri. R. Hanly, Elliot B.Koffman, Pearson Publication.

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GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
ENGLISH

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Course Code: GR17A1005   **L: 2 T: 1 P: 0 C: 3**

Prerequisites: Familiarity with basic language and communication skills.
Unit I

Sir C.V. Raman- Enjoying Every Day English & **Mother Teresa**- Inspiring Speeches and Lives

Unit II
i) Grammar : Types of Articles and their usages; Tense and Aspect; Subject verb Agreement; Prepositions; Redunduncies and clichés; Correction of Sentences;

ii) Vocabulary Development : Synonyms and Antonyms; One-word substitutes; prefixes and suffixes; words often confused; idioms and phrases; Standard Abbreviations in English

iii) Speaking & Writing skills : Information transfer; Public Speaking; Paragraph Writing; Punctuation; Essay Writing;

Unit-III
Connoisseur - Enjoying Every day English & **Sam Pitroda**- Inspiring Speeches and Lives

Unit IV
Bubbling Well Road- Enjoying Every day English & **Amarthya Kumar Sen**- Inspiring Speeches and Lives

Unit V
Cuddalore Experience- Enjoying Every day English &**Martin Luther King Jr.** (I have a dream) - Inspiring Speeches and Lives

Text Books

1. Enjoying Every day English by A. Rama Krishna Rao- Sangam Books
2. Inspiring Speeches and Lives by Dr.B.YadavaRaju, Dr.C.Muralikrishna, Maruthi Publications.

Reference Books

1. Murphy's English Grammar with CD, Murphy, Cambridge University Press.
2. Effective Technical Communication, M. Ashraf Rizvi, Tata McGraw Hill.
3. Technical Communication, Meenakshi Raman, Sangeeta Sharma, Oxford higher Education.
4. English for Engineers Made Easy, AedaAbidi, Ritu Chaudhry, CengageLearning.
5. Communicate or Collapse, PushpLatha, Sanjay Kumar, PHI Learning Pvt.Ltd.
6. Communication Skills, Sanjay Kumar, PushpLatha, Oxford Higher Education.
7.A Hand Book for Engineers, Dr. P. Eliah, BS Publication

Course Code: GR17A1019   **L: 2 T: 1 P: 0 C: 3**

Prerequisites
  - o   Fundamentals of Modern Physics
  - o   Fundamentals of Electrical Networks

Unit-I
Semiconductors and pn Junction Diode: Semiconductor Physics: n and p type semiconductors, Mass Action Law, Continuity Equation, Hall Effect, Fermi level in intrinsic and extrinsic semiconductors, Open- circuited p-n junction, Energy band diagram of PN diode, forward bias and reverse bias, Current components in p-n diode, Law of junction, Diode equation, Volt-ampere characteristics of p-n diode, Temperature dependence of V-I characteristic, Transition and Diffusion capacitances, Breakdown Mechanisms in Semiconductor Diodes (Avalanche and Zener breakdown), Zener diode characteristics.

Unit-II
Diode Applications, Special Diodes: Half wave rectifier, ripple factor, full wave rectifier, Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L- section filter, Π-section filter, and comparison of various filter circuits in terms of ripple factors, Simple circuit of a regulator using zener diode, Series and Shunt voltage regulators
Special Diodes: Characteristics of Tunnel Diode, Varactor Diode, LED, LCD.

Unit-III
Bipolar Junction Transistor: Junction transistor, Transistor current components, Transistor as an amplifier, Transistor construction, Detailed study of currents in a transistor, Input and Output characteristics of transistor in Common Base, Common Emitter, and Common collector configurations, Relation between Alpha and Beta and Gamma, typical transistor junction voltage values,

Junction Field Effect Transistors (JFET): JFET characteristics (n and p channels), Small signal model of JFET, MOSFET characteristics (Enhancement and depletion mode), Introduction to SCR and UJT.

Unit-IV
Biasing and stabilization : BJT biasing, DC equivalent model, criteria for fixing operating point, Fixed bias, Collector to base bias, Self-bias techniques for stabilization, Stabilization factors, Compensation techniques, Compensation against variation in VBE and Ico, Thermal run away, Thermal stability.

Unit-V
Amplifiers: Small signal low frequency transistor amplifier circuits: h-parameter representation of transistor, Analysis of single stage transistor amplifier using h-parameters: voltage gain, current gain, Input impedance and Output impedance. Comparison of transistor configurations in terms of Ai, Ri, Av, Ro.

Text Books

1. David A. Bell; Electronic Devices and Circuits, Oxford University Press, 5th edition, 2008.
2. R.L. Boylestad and Louis Nashelsky; Electronic Devices and Circuits, Pearson/Prentices Hall, 9th Edition, 2006.

Reference Books

1. T.F. Bogart JrJ.S.Beasley and G.Rico; Electronic Devices and Circuits – Pearson Education, 6th edition, 2004.

ENGINEERING WORKSHOP

Course Code: GR17A1025   **L: 0 T: 0 P: 2 C: 2**
Prerequisites
Knowledge in dimensions and units, Usage of geometrical instruments and analytical ability

Unit-I
Carpentry Shop – 1:
Introduction to various types of wood such as Teak, Mango, Chesham, etc. (Demonstration and their identification).
Demonstration, function and use of commonly used hand tools. Care, maintenance of tools and safety measures to be observed. Job I Marking, sawing, planning and chiseling& their practice
Introduction to various types of wooden joints, their relative advantages and uses. Job II Preparation of half lap joint Job III Preparation of Mortise and Tenon Joint
Safety precautions in carpentry shop.

Unit-II
Fitting Shop – 2:
Introduction to fitting shop tools, common materials used in fitting shop.
Description and demonstration of simple operation of hack-sawing, demonstration and description of various types of blades and their specifications, uses and method of fitting the blade.
Job I Marking of job, use of marking tools and measuring instruments.
Job II Filing a dimensioned rectangular or square piece of an accuracy of + 0.5 mm Job III Filing practice (production of flat surfaces). Checking by straight edge.
Job IV Making a cutout from a square piece of MS Flat using hand hacksaw such as T-fit and V-fit
    Care and maintenance of measuring tools like calipers, steel rule, try square.

Unit-III
House wiring – 3:
Study, demonstration and identification of common electrical materials such as wires, cables, switches, fuses, PVC Conduits.
Study of electrical safety measures and demonstration about use of protective devices such as fuses, and relays including earthing.
Job I Identification of phase, neutral and earth of domestic appliances and their connection to two pin/three pin plugs.
Job II Preparation of a house wiring circuit on wooden board using fuse, switches, socket, holder, ceiling rose etc. in PVC conduit and PVC casing and capping wiring system.
Job III Two lamps in series and parallel connection with one way switch
Job IV Two lamps in series and one lamp in parallel connection with one way switch.
Job V Stair case lamp connection with two way switch.

Unit-IV
Tin- smithy – 4:
Introduction to tin -smithy shop, use of hand tools and accessories e.g. different types of hammers, hard and soft mallet, sheet and wire gauge, necessary allowance required during job fabrication, selection of material and specifications.
Introduction and demonstration of hand tools used in tin -smithy shop.

Introduction and demonstration of various raw materials used in sheet metal shop e.g. M.S. sheet, galvanized-iron plain sheet, galvanised corrugated sheet, aluminum sheets etc. Corrugated sheet, aluminum sheets etc.

4.4. Preparation of a rectangle tray and open scoop/ funnel.

Reference Books
1. Workshop Technology I, II, III, by S K Hajra, Choudhary and A K Choudhary. Media Promoters and Publishers Pvt. Ltd., Bombay
2. Workshop Technology by Manchanda Vol. I, II, III India Publishing House, Jalandhar.
3. Manual on Workshop Practice by K Venkata Reddy, KL Narayana et.al; MacMillan India Ltd.
4. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd. New Delhi
5. Workshop Technology by B.S. Raghuwanshi, DhanpatRai and Co., New Delhi.
6. Workshop Technology by HS Bawa, Tata McGraw Hill Publishers, New Delhi.

COMPUTER PROGRAMMING LAB

Course Code: GR17A1027   **L: 0 T: 0 P: 2 C: 2**

Prerequisite: Basic operations of computer and knowledge of mathematics

Task- 1

1. The heights of three students are 165, 148, 154 cm. respectively. Write a C program to sort the heights of the students in descending order.
2. Write a C program to find the roots of a quadratic equation using if-else.
3. The program should request the user to input two numbers and display one of the following as per the desire of user.
a. Sum of numbers
b. Difference of numbers
c. Product of the numbers
d. Division of the numbers.
4. Write a C program using switch statement to accomplish the above task.

5. In a mathematical number sequence let the first and second term in the Sequence are 0 and 1. Subsequent terms are formed by adding the preceding terms in the sequence. Write a C program to generate the first 10 terms of the sequence.

Task-2

1. Write a C program to construct pyramid of numbers.
2. The reliability of an electronic component is given by reliability $r=e^{-\lambda t}$ where λ is the component failure rate per hour and t is the time of operation in hours. Determine the reliability at various operating times from 0 to 3000 hours by plotting a graph using a C program. The failure rate λ is 0.001. Plot the graph with a special symbol.
3. Write a C program to accept the date of birth and the current date to find the age of the person. The output should specify the age of a person in terms of number of years, months and days.

Task- 3

1. Write a C program to calculate the following Sum: $Sum=1-x^2/2!+x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$
2. For a certain electrical circuit with an induction (L) and Resistance (R) , the damped natural frequency is given by $f=\sqrt{(1/LC - R^2/4C^2)}$. Write a C program to calculate the frequency for different values of C starting from 0.01 to 0.1.
3. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Task - 4

1. Write a C program to find both the largest and smallest number in a list of integers.
2. Write a C Program to search whether a given number is present in set of integers
3. Write a C Program to sort a given list of integers.

Task - 5

1. Write a C program to count the lines, words and characters in a given text.

2. Write a C program to sort the names of 5 students in the alphabetical order.
3. Ex: Rita, Sneha, Priti, Briya, kitti as Briya , Kitti, Priti, Rita, Sneha c) Write a C program to print all the rotations of a given string.
4. Ex: Rotations of the string "NEWS" are NEWS EWSNWSNESNEW

Task - 6

1.   Write a C program to perform the following operations:
a. To insert a sub-string in a given main string at a given position.
b. To delete n Characters from a given position in a given string.
6. Write a C program to determine if the given string is a palindrome or not?

Task - 7

1. Write a C program that uses functions to perform the following:
   a. Transpose of a matrix
   b. Addition of Two Matrices
   c. Multiplication of Two Matrices

Task - 8

1. Write C programs that use both recursive and non-recursive functions
a. To find the factorial of a given integer.
b. To print the Fibonacci sequence
   c. To find the GCD (greatest common divisor) of two given integers.

Task- 9

1. Using pointers, write a function that receives a character string and a character as argument and deletes all occurrences of this character in the string.
2. Write a function using pointer parameter that compares two integer arrays to see whether they are identical. The function returns 1 if they areidentical, 0 otherwise.

Task -10

1. Write a C program that uses functions to perform the following operations on two complex numbers
a) Addition
b) Subtraction
c) Multiplication
d) Division
   (Note: represent complex number using a structure.)

Task-11

1. Write a c program which accepts employee details like (outer structure: name, employee_id, salary and (inner structure: area, street number, houseno)).Display the employee names and id belonging to a particular area.
2. Let us suppose that a hotel consists of name, address, average room charge and number of rooms. Then write a function to print out hotels with room charges less than a given value. (structures and functions)

Task - 12

1. Write a C Program to display the contents of a file.
2. Write a C Program for merging of two files into a single file.
3. Write a C Program to append data into a file.

Task - 13

1. Write a C program which copies one file to another.
2. Write a C program to reverse the first n characters in a file.

   (Note: The file name and n are specified on the command line.)

Task-14

1. Write a C program to develop Tic Tac Toe game
2. Write a C program to solve Towers of Hanoi

Text Books

1. Programming in C, Ashok N Kamthane, 2nd edition, Pearson Publication.
   2. The C Programming Language, BRIANW. KERNIGHAN Dennis M.Ritchie, Second Edition, PHI.
   3. Computer Programming and Data structures by E Balaguruswamy, published by Mc GrawHill.

Reference Books

1. Programming in C, PradipDey, Manas Ghosh, Second Edition, Oxford University Press.
2. Let Us C, YashwanthKanetkar, 10th Edition, BPB Publications.
3. C& Data structures, P.Padmanabham, B.S. Publications.
4. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
5. Programming with problem solving, J.A.Jones & K.Harrow, Dreamtech Press.
6. Programming in C, Stephen G.Kochan, III Edition, Pearson Education.
7. Problem solving and program design in C, Jeri. R. Hanly, Elliot B. Koffman, Pearson Publication.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
ENGINEERING PHYSICS LAB

Course Code: GR17A1029   **L: 0 T: 0 P: 2 C: 2**

Prerequisites: Fundamentals of Physics and Mathematics.

List of Experiments:

Task-1
Determine the energy gap of a given semiconductor.

Task-2

Calculate the energy loss in a given Ferro magnetic material by plotting B-H curve.

Task-3
Calculate the Numerical Aperture of a given optical fiber.

Task-4
Determine the Dielectric constant and Curie temperature of PZT material.

Task-5
Calculate the Acceptance angle of a given optical fiber.

Task-6
Draw V-I & L-I Characteristics of LASER diode.

Task-7
Determine the bending losses in a given optical fibers.
Task-8
Determine the Air-gap losses in a given optical fibers.

Task-9
Determine the Hall Coefficient in Ge semiconductor by using Hall Experimental setup.

Task-10
Determine the carrier concentration, mobility of charge carrier in Ge semiconductor.

Task-11
Measure Ac voltage and frequency through CRO.

Task-12
Measure Resistance and Capacitance by using digital multimeter.

Task13:
   Determination of wave length of a source -Diffraction Grating.

Task14:
   Determination of Rigidity modulus of a given wire - Torsional Pendulum
Task15:

   Dispersive power of the material of a prism

Task16:
   Determination of wave length of a source using N

Task17:
    Draw V-I and L-I characteristics - LED

II SEMESTER

TRANSFORM CALCULUS AND FOURIER SERIES

Course Code: GR17A1003   **L: 2 T: 1 P: 0 C: 3**

Prerequisites: Differential and integral calculus, multiple integrals and linear   differential equations

Unit-I

Improper Integrals and Beta, Gamma Functions: Beta and Gamma functions – Their properties– Evaluation of improper integrals in terms of Beta and Gamma functions.
Improper integrals of the first Kind- Improper integrals of the second kind Convergence of Improper Integrals

Unit-II

Laplace Transform: Introduction Basic theory of Lalace Transforms-Definition and existence of the Laplace Transform-Elementary functions- Properties of the Laplace transform-Convolution integral - Convolution theorem-Heaviside's unit step-function-Dirac delta function.

The inverse Laplace transform-Properties-Method of partial fractions- Heaviside's inversion formula-Inversion by convolution theorem.
Application of the Laplace transform to solve initial value problems and boundary value problems in ODE.
Solution of a system of linear differential equations-Solution of problems in electrical circuits by Laplace transforms method.
Laplace Transform Method for the solution of some Partial Differential Equations

Unit-III

Z-Transform and Fourier series: Introduction- Basic Theory of Z transform - Definition-Z transform of elementary sequences-Properties- The inverse Z Transform, Z transform to solve difference equations -Application of Z transform to find the sum of series
Definition of orthogonal functions-The concept of Weight function-Fourier series of 2L periodic functions- Fourier expansion of 2π periodic functions-Half range Fourier series expansions.

Fourier Series Expansions of Even and Odd functions

Unit-IV

Fourier Transform: Exponential Fourier series-Introduction – Definition-Fourier integrals –Fourier sine and cosine integral. The continuous one dimensional Fouriertransform-Properties-Convolution-Parseval's identity- Fourier Sine and Cosine transforms.

Unit-V

Partial differential equations: Introduction- formulation of First and Second order Partial Differential Equations -Solution of Lagrange's linear equations-Method of separation of variables to solve IBVP like 1-D heat, 1-D wave and BVP like 2-D Laplace's equations.
Application of Fourier transform to the solution of partial differential equations

Text Books

1. Advanced Engineering Mathematics: R. K. Jain and S. R. K. IyengarNarosa Publishing House.
2. Advanced Engineering Mathematics: Erwin Kreyszig-Wiley
3. Schaum's outline series on Laplace transforms

Reference Books

1. Higher Engineering Mathematics: B. S. Grewal-Khanna Publications
2. Higher Engineering Mathematics: C. Das Chawla-Asian Publishers
3. GRIET reference manual

NUMERICAL METHODS

Course Code: GR17A1004   **L: 2 T: 1 P: 0 C: 3**

Prerequisites: Elementary calculus, Partial differentiation, Geometry and ordinary differential equations.

Unit-I

Root finding techniques and Numerical solution of linear algebraic systems: Bisection method-RegulaFalsi- Fixed point iteration method-Newton Raphson method, Ramanujan's Method, Secant Method, Muller's Method, Lin-Bairstow's methos.

LU decomposition method- -Jacobi and Gauss Seidel iteration methods-Matrix Eigenvalue Problem Householder's Method, Eigen values of a Symmetric Tridiagonal Matrix.

Unit-II

Interpolation and Cubic Splines: Finite differences - Forward, backward and central differences, Relationship between operators- Interpolation with uniform data-Newton's forward and backward difference interpolation formulas- Gauss forward, Gauss backward and Stirling's central interpolation , Bessel's, Everett's formulae- Lagrange, Hermite's and Newton's divided difference interpolation formulas for non-uniform data- Cubic spline interpolation, Inverse Interpolation, Double Interpolation.

Unit-III

Curve fitting and B-spline approximation: Fitting a straight line, and second degree parabola, exponential and power curves to data, method of Least Squares for Continuous functions-Orthogonal Polynomials, Chebyshev Polynomials.
Approximation of functions by Cubic B-Splines, Applications of B-splines

Unit-IV

Numerical differentiation and numerical integration: Numerical differentiation using the Newton's forward, backward and central difference formulas- Maximum and Minimum Values of a Tabulated Functions
Numerical integration by Trapezoidal rule, Simpson's 1/3rd and 3/8th rules, Boole's and Weddle's Rules, Romberg Integration, Newton- Cotes Integration Formulae.

Unit-V

Numerical solution of initial and boundary value problems in ODE: Initial Value Problems: Picard's method of successive approximation, Solution by Taylor series method, Euler method, Runge-Kutta methods of second and fourth orders. Predictor-corrector methods, Combinations of first and second order P-C methods. Boundary Value Problems in ODE: Finite difference methods for solving second order linear ODE.

Teaching Methodologies

- Tutorial sheets uploaded in website
- NPTEL video lectures
- MATLAB exercises for visualization

Text Books

1. Advanced Engineering Mathematics: R.K.Jain and S.R.K.Iyengar- Narosa Publishing House.
2. Advanced Engineering Mathematics: Erwin Kreyszig- Wiley.
3. Introductory methods of Numerical Analysis (5th edition)-S.S.Sastry- PHI.

Reference Books

1. Applied Numerical Methods using MATLAB- Yang, Cao, Chung & Morris – Wiley Interscience
2. Numerical methods in Engineering with MATLAB-Jaan Kiusalaas -Cambridge University Press.
3. GRIET Reference Manual.

ENGINEERING CHEMISTRY

Course Code: GR17A1008   **L: 2 T: 1 P: 0 C: 3**

Prerequisites: Fundamentals in Engineering Chemistry Theory Course

Unit-I

Water Technology: Sources of natural water, impurities, hardness: causes, types, expression, units, estimation of hardness of water using complexometric titration method, problems on hardness, Boiler feed water, boiler troubles (scale, sludge, carry over, Caustic Embrittlement, Boiler Corrosion). Internal treatment methods (carbonate, phosphate, Calgon), Softening of water – Lime Soda, Ion- Exchange and zeolite processes. Potable water- its characteristics and steps involved in Municipal Water Treatment, Chlorination- Break Point Chlorination, sterilization by ozonation. Desalination of Brackish water - Reverse Osmosis, Electrodialysis. Waste water-types of effluents, domestic and industrial effluents, sewage treatment-primary, secondary and tertiary .

Unit-II

Electrochemistry & Corrosion: Concept of Conductance -specific, equivalent, molar conductance and their inter relationships applications of conductance-conductometric titrations-(Strong acid Vs Strong Base and Weak Acid Vs Strong Base). EMF of a cell, Single Electrode Potential, Standard Electrode potential, potentiometric titrations(dichrometry), Electro chemical series and its applications, Electrochemical Cells-types, Galvanic cell: cell representation, Cell reactions, Cell EMF, Electrolytic cells, Concentration cell. Batteries-types, dry cell, Lithium Cells (liquid and solid cathode), Secondary cells: Pb-PbO2 cell, Fuel cells: H2-O2 fuel cells and their applications.
Corrosion: Causes and effects of corrosion-types of corrosion- chemical (Dry) corrosion-types and their mechanism, Electrochemical (Wet) corrosion and its mechanism, factors affecting the rate of corrosion – nature of metal and nature of environment. Corrosion Control Methods-Cathodic Protection: Sacrificial Anodic, Impressed Current Cathodic protection. Metallic Coatings –Anodic and Cathodic coatings, Methods of application of metallic coatings- Hot Dipping method (Galvanization and tinning), Electroplating (Cu coating), Electroless plating (Ni plating), Organic Coatings: Paints – its constituents and their functions.

Unit-III

Engineering Materials I: Cement-types-port land cement –composition, Setting & Hardening of Portland cement.
Ceramics-types-ceramic products - whitewares, Stone wares, preparation, properties and applications of ceramics.
Refractories-classification, properties (refractoriness, RUL, porosity, thermal spalling) and their application.
Lubricants: Classification with examples, mechanisms of lubrication (thick film, thin film, extreme pressure), solid lubricants, properties of lubricants- viscosity, flash point, fire point, cloud point, pour point (Definition and significance).

Unit-IV

Engineering Materials II: Electronic materials: Semiconductors, intrinsic & extrinsic semiconductors, Preparation of Pure Ge and Si by Zone Refining, Czochralski Crystal Pulling, Doping Techniques-Epitaxy, Diffusion & ion implantation.
Polymer Materials: Monomer, polymer, types of polymerization-addition and

condensation, Plastics-Thermoplastic resins, Thermo set resins. Compounding & fabrication of plastics (compression & Injection moulding), Preparation, Properties, Engineering applications of High Density Poly Ethylene (HDPE), differences between HDPE & LDPE, Poly Vinyl Chloride (PVC), Bakelite & Nylon 6,6. Organic Light Emitting Diodes (an Overview). Biodegradable polymers-their advantages and their applications. Elastomers – preparation, properties and applications of Butyl rubber, Styrene-Butadiene Rubber. Conducting polymers, classification with examples-mechanism of conduction in trans poly acetylene and their applications.

Unit-V

Energy sources: Fossil Fuels: Fossil Fuels: Coal –types, analysis of coal- proximate and ultimate analysis and their significance, Calorific value of fuel – HCV, LCV, Determination of Calorific Value using BOMB calorimeter, analysis of flue gas using Orsat apparatus, Theoretical calculation of Calorific Value by Dulong's formula, Numerical Problems. Petroleum-its composition-synthetic petrol – Bergius and Fischer Tropsch's processes, cracking -definition, its types and significance, knocking and its mechanism in Internal Combustion engines, Octane Rating of Gasoline, Composition, and applications of natural gas, LPG, CNG. Bio-fuels: preparation of Bio-diesel by trans esterification method, advantages of Bio-fuel.

Text Books
1. A text book of Engineering Chemistry by PC Jain and Monica Jain, DhanpatRai publishing company.

Reference Books
1. A text book of Engineering Chemistry by SS Dara and SS Umre, S Chand publications.
2. A text book of Engineering Chemistry by Dr Y Bharathikumari and DrChJyothsna, VGS publications.
3. A text book of Engineering Chemistry by R.P.Mani, K.N.Mishra, B.Rama Devi, V.R.Reddy, cengage learning publications

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
DATA STRUCTURES

Course Code: GR17A1010   **L: 2 T: 1 P: 0 C: 3**

Prerequisites: Intermediate programming in a high-level language and introduction to computer science. Topics include program structure and organization, data structures (lists, trees, stacks, queues) C is the principal programming language.

Unit-I

Introduction to data structures: Stacks, Stack Operations, Representation of a Stack using Arrays, Stack Applications: Recursion, Infix to postfix Conversion, Evaluating Arithmetic Expressions.

Unit-II

Queues: Basic Queues Operations, Representation of a Queue using array, Implementation of Queue Operations using arrays, Applications of Queues, Circular Queues, Priority Queues, Enqueue, Dequeue.

Unit-III

List: Introduction, single linked list, representation of a linked list in memory, Operations-insertion, deletion, display, search, circular linked list, Double linked list, Applications advantages and disadvantages of single linked list, Implementation of stack, queue using linked list.

Unit-IV

Trees: Basic tree concepts, Binary Trees: Properties, Representation of Binary Trees using arrays and linked lists, operations on a Binary tree, Binary Tree Traversals (recursive), Creation of binary tree from in-order and pre (post)order traversals.

Unit-V

Sorting and Searching: Insertion (Insertion sort), selection (heap sort) and selection soft, exchange (bubble sort, quick sort), distribution (radix sort) and merging (merge sort) Algorithms, Searching: Linear, binary search, indexed sequential search.

Text Books

1. Data Structures, 2/e, Richard F, Gilberg, Forouzan, Cengage
2. Data Structures and Algorithms, 2008,G.A.V.Pai, TMH

Reference Books

1. Data Structure with C, Seymour Lipschutz, TMH
2. Classic Data Structures, 2/e, Debasis, Samanta, PHI, 2009
3. Fundamentals of Data Structure in C, 2/e, Horowitz, Sahni, Anderson Freed, University Press

ENGINEERING GRAPHICS

Course Code: GR17A1023   **L: 1 T: 0 P: 2 C: 3**

Prerequisites: Knowledge in dimensions and units, Usage of geometrical instruments and analytical ability.

Unit-I
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 & their Constructions: a) Conic Sections, b) Cycloid, Epicycloid and Hypocycloid, c) Involutes.

SCALES: Different types of scales. Plain Scale, Diagonal Scale &Vernier Scale

Unit-II
ORTHOGRAPHIC PROJECTIONS: Principles of Orthographic Projections Conventions Firsthand Third Angle Projections. Projections of Points and Lines inclined to both planes, True lengths, traces.

Unit -III
PROJECTIONS OF PLANES: Planes parallel, perpendicular and inclined to one of the reference planes. Plane inclined to both the reference planes.

PROJECTIONS OF SOLIDS: Projections of Regular Solids inclined to both planes.

Unit-IV
SECTIONS OF SOLIDS: Types of section planes, Section by a plane perpendicular to V.P., Section by a plane perpendicular to H.P.

DEVELOPMENT OF SURFACES: Development of Surfaces of Right Regular Solids Prisms, Cylinder, Pyramid, Cone and their parts.

Unit-V
ISOMETRIC PROJECTIONS: Principles of Isometric Projection Isometric Scale Isometric Views Conventions Isometric Views of Lines, Plane Figures, Simple and Compound Solids Isometric Projection of objects having non- isometric lines. Isometric Projection of Spherical Parts.

TRANSFORMATION OF PROJECTIONS: Conversion of Isometric Views to Orthographic Views Conventions.

Text Books
1. Engineering Drawing, N.D. Bhat / Charotar
   Reference Books
   1. Engineering Drawing and Graphics, Venugopal / New age.
   2. Engineering Drawing- Johle/Tata Macgraw Hill.
   3. Engineering Drawing, Narayana and Kannaiah / Scietech publishers. Engineering Drawing, Narayana and Kannaiah / Scietech publishers.
   4. Engineering Drawing Basanth Agrawal/ C M Agrawal; 2e McGraw Hill Education

BASIC ELECTRICAL ENGINEERING

Course Code: GR17A1018   **L: 2 T: 1 P: 0 C: 3**

Unit-I
Basic Laws: Ohm's law , Kirchhoff's voltage and current laws , Nodes-Branches and Loops ,Series elements and Voltage Division , Parallel elements and Current Division , Star-Delta transformation, Independent sources and Dependent sources , Source transformation.

Unit-II
AC Fundamentals-I: Review of Complex Algebra , Sinusoids , Phasors , Phasor Relations of Circuit elements , Impedance and Admittance , Impedance Combinations , Series and Parallel combination of Inductors and Capacitors, Mesh analysis and Nodal Analysis.

Unit-III
AC Fundamentals-II: RMS and Average values, Form factor, Steady State Analysis of Series, Parallel and Series Parallel combinations of R, L,C with Sinusoidal excitation, Instantaneous power, Average power, Real power, Reactive power and Apparent power, concept of Power factor, Frequency.
Unit-IV
Resonance and Network Theorems: Resonance in Electric circuits: Analysis of Series and Parallel Resonance, Theorems: Superposition theorem, Thevinin's theorem, Norton's Theorem, Maximum Power Transfer Theorem, Reciprocity theorem.

Unit-V
Fundamentals of Electrical Machines: Construction, Principle, Operation and Applications Of–(i) DC Motor,(ii) Single phase Transformer (iii) Single phase Induction motor

Text Books
  1. Fundamentals of Electric Circuits by Charles K.Alexander, Matthew N.O.Sadiku, Tata McGraw Hill Company.

Reference Books
  1. Circuit Theory (Analysis and Synthesis) by A.Chakrabarti – DhanpatRai& Co
  2. Basic Electrical Engineering by Nagasarkar, Oxford Publishers
  3. Network Theory by Prof.B.N.Yoganarasimham.
  4. Engineering Circuit Analysis by William H.Hayt.Jr, Jack E.Kemmerly and Steven
  5. M.Durbin by Tata McGraw Hill Company.
  6. Electrical Engineering Fundamentals by Vincent Deltoro 6.Circuit Theory by Sudhakar and ShyamMohan

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
BUSINESS COMMUNICATION AND SOFT SKILLS

Course Code: GR17A1024   **L:0 T: 0 P: 2 C: 2**

Prerequisites: Familiarity with basic language and communication skills.
Unit-I
Just A Minute (JAM); Ice Breaking Activity: Self-Introduction ; Introducing others; elocution

Unit-II
Phonetics
Introduction to speech sounds; identification of sound symbols; vowel and consonants; Word stress and Rhythm; Word Accent; Difference in British and American Pronunciation; Indian English

Unit-III
Role play
Introduction to role play;; Telephonic Etiquette; situation handling; making requests; seeking permissions; greetings; showing gratitude; situation handling; non-verbal communication

Unit-IV
Debate and Brain-Storming
Introduction and features of Debate; Types of Debate; Understanding critical thinking; building sustainable arguments; assessing credibility of the argument; overcoming obstacles; Introduction to Brain-Storming; brain-storming technique

Unit-V
Describing a Person, Situation, Process and Object

Unit-VI
Letter Writing
Manual and Emailing; types and formats; letter writing expressions; content and body of the letter. Email etiquettes

Unit-VII
Report Writing
Formats and types of reports; structure of reports

Unit-VIII
Mind Mapping and Six Thinking Hats
Assimilation of thoughts; expansion of ideas on central idea; suggesting parameters to carry forward the thinking process without deviation

Reference Books

1. Business Communication; Hory Sankar Mukerjee; Oxford University Press
2. Business Communication; Meenakshi Raman, Prakash Singh; Oxford University Press
3. English and Soft skills; SP DHanavel; Orient Blackswan
4. Soft Skills for Everyone; Jeff Butterfield; Cengage Learning
5. Communication Skills; Viva Career Skills Library
6. Personality Development and Soft Skills; Barun K Mitra; Oxford University Press
7. Six Thinking Hats, Penguin Books, Edward De Bono
8. English for Engineer's; AedaAbidi, Ritu Chaudhry; Cengage Learning
9. Communication Skills ; Sanjay Kumar , Pushpalatha; Oxford University Press
10. Business English : The Writing Skills you need for today's work place: Geffner, Andrea: Fifth edition, Barron's Educational Series, Newyork

IT WORKSHOP

Course Code: GR17A1026   L: 0 T: 0 P: 2 C: 2
Prerequisites:

- Fundamentals of Computer and its parts.
- Identification of peripherals of computer.

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

Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber-attacks would be introduced. Productivity tools module would enable the students in crafting professional word documents, spread sheets and slide presentations.

Task-1

Installation of OS Every student should install Ubuntu and RedHat Linux on the computer. Lab instructors should verify the installation and follow it up with viva.

Task-2

Hands on experience on Open Office: Every student should install open office on the computer. Students would be exposed to create word documents with images, tables, formula and with additional word processing features, Power point presentation, Excel and access. Lab instructors should verify the installation and follow it up with viva.

Task-3

Internet Based Applications: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google.

Task-4

Networking-Network Infrastructure: Understand the concepts of Internet, intranet, and extranet, local area networks (LANs), Wide area networks (WANs), Wireless networking, network topologies and access methods

Task-5

Network Hardware: Understand switches, routers, media types. static routing, dynamic routing(routing protocols), default routes; routing table and how it selects best route(s); routing table memory, network address translation (NAT).Introduction to Cisco Packet Tracer, design LAN using routers and switches.

Task-6

Network Protocols: Understand the Open Systems Interconnection (OSI) model, IPv4, IPv6,tunnelling, dual IP stack, subnet mask, gateway, ports, packets, reserved address ranges for local use (including local loopback IP) Understanding Cisco Router and Switches.

Task-7

Network Services: Understand names resolution, networking services, TCP/IP-Tools (such as ping), tracert, pathping, Telnet, IPconfig, netstat, reserved address ranges for local use (including

local loopback IP), protocols.

Task-8

Database -Core Database Concepts: Understand how data is stored in tables, Understanding DML and DDL statements.

Task-9

Creating and Insertion of Data: Understanding Data types, tables and how to insert data in to the tables.

Task-10

HTML Basic HTML Tags: Understand what are the tags used for creation of website.

Task-11

Designing a Static web page: Understand how to create static web page using forms and tables.

References Books

1. Introduction to Information Technology, ITL Education Solutions Limited, Pearson Education.
2. Introduction to Computers, Peter Norton, 6/e McGraw Hill
3. Upgrading and Repairing, PC's 18th e, Scott Muller QUE, Pearson Education
4. Comdex Information Technology Course tool kit Vikas Gupta, WILEY Dreamtech
5. IT Essentials PC Hardware and Software Companion Guide, Third Edition by David Anfinson and Ken Quamme- CISCO Press, Pearson Education
6. PC Hardware and A+Handbook – Kate J. Chase PHI(Microsoft)
7. ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc- Graw Hill
8. Introduction to Database Systems, C.J.Date Pearson Education.
9. Networking Fundamentals, Wiley, by Microsoft Official Academic Course, 1st Edition.

Suggested Tutorials on Lab:

Tutorial/Lab 1: Installation of Ubuntu and RedHat Linux on the computer. Lab instructors should verify the installation and follow it up with viva

Tutorial/Lab 2: Students would be exposed to create word documents with images, tables, formula and with additional word processing features, Power point presentation, Excel and access. Lab instructors should verify the installation and follow it up with viva.

Tutorial/Lab 3: Understand the concepts of networking topics

Tutorial/Lab 4: DDL and DML statements

Tutorial/Lab 5: Designing of static web page and verify it.

ENGINEERING CHEMISTRY LAB

Course Code: GR17A1030   **L: 0 T: 0 P: 2 C: 2**

Prerequisites: Fundamentals in Engineering Chemistry Laboratory

List of Experiments

Task-1 Estimation of Total Hardness in sample water by complexometry

Task-2 Estimation of percentage available chlorine in Bleaching Powder.

Task-3 Estimation of Fe^{2+} by permanganometry.

Task-4 Determination of strength of an acid by potentiometric titration method

Task-5 Determination of strength of an acid by using conductometry.

Task-6 Determination of Strength of an acid in Pb-Acid battery by titrimetric method

Task-7 Determination of percentage of Iron in Cement sample by colorimetry...

Task-8 Estimation of Calcium in port land cement.

Task-9 Determination of Viscosity of the given unknown liquid by Oswald's viscometer.

Task-10 Determination of surface tension of the given unknown liquid by stalagmometer.

Task-11 Preparation of Thiokol rubber.

Task-12 Determination of percentage Moisture content in a coal sample.

Task 13. Estimation of ferrous iron by potentiometric titration using dichromate.

Task 14. Preparation of aspirin drug.

Reference Books

1. Laboratory Manual on Engineering Chemistry, by DrSudha Rani, DhanpatRai Publishing house.
2. A Text book on Experiments and calculations in Engineering Chemistry, by SS Dara,
3. S Chand publications.
4. Laboratory Manual of Organic Chemistry, by Raj K Bansal, Wiley Eastern Limited, New age international limited.
5. Engineering Chemistry practical manual prepared by faculty of engineering chemistry, GRIET(A) - (for college circulation only)

II YEAR
I SEMESTER

PROBABILITY AND STATISTICS

Course Code: GR17A2011   L:2 T:1 P:0 C:3

Unit-I
Probability: Basic concepts in Probability - Conditional probability–Addition and Multiplication theorems for two events,(Concepts without derivations)- Bayes' theorem, Boole's inequality.
Random variables: Definition of a random variable, discrete and continuous random variables –Distribution function and statement of its properties. Probability mass function, probability density function with illustrations -Joint, marginal and conditional distributions with illustrations, statistical independence - Mathematical expectation and variance of ar.v with examples and statement of their properties.

Unit-II
Distributions: Distributions: Binomial, Poisson, Normal, Gamma andExponential distributions(definition, Statements of their Mean and Varianceand problems).evaluation of parameters inBinomial and Poisson distributions.
Sampling distribution: Definition of Population and sample, Overview of types of sampling(Purposive,Random, SRS with and without replacement cases, Stratified and Systematic random samplings) – Sampling distribution, standard error, statements of sampling distribution of mean(s) (Population variance(s)known and unknown) and proportion(s) (Population proportion(s)known and unknown) with examples.

Unit-III
Estimation and Testing of Hypothesis: Estimation &Testing of Hypothesis:Definitions of Point and Interval estimation. Confidence intervals for single mean, difference of two means, single proportion and difference of two proportions. Concepts of Null and Alternative hypotheses, Critical region, Type I and Type II errors, one tail and two tail tests, Level of significance and power of a test.
Large Samples Tests: Tests of hypothesis for mean(s) (single and difference between means), Tests of hypothesis for proportion(s) (single and difference between proportions), Chi-square test for testing goodness of fit and independence of attributes.

Unit-IV
Small samples: Student's t-test for testing the significance of single mean, difference of means(independent samples and paired samples), F-test for equality of variances (Concepts and problemsolving)
Correlation & Regression: Product moment correlation coefficient, Spearman's rank correlation coefficient and Statements of their properties – Simple linear regression, Lines of Regression, Regression coefficients and Statements of their properties, Multiple regression for three variables only.

Unit-V
Stochastic Process: Definitions of stochastic process, parameter space and state space.Classification of stochastic processes. Definitions of a Markov chain, transition probability matrix, initial probability distribution. Classification of states in a Markov chain and limitingdistribution.
Queuing theory: Queue description, characteristics of a queuing model, Poisson process,

concept of Birth and death process, steady state solutions of (M/M/1: ∞/FIFO) and (M/M/1: N/FIFO).(Concepts and problem solving).

Teaching Methodologies
- Chalk &Talk
- Ppts

Text Books
1. Probability and statistics for engineers (Erwin Miller and John E. Freund), R.A Johnson and C. B. Gupta, Pearson education.
2. Fundamentals of Stochastic process-Medhi (for Unit-V), New age international publications.
3. Probability and Statistics, Dr. T. K. V. Iyengar, Dr. B. Krishna Gandhi et.al, S. Chand.

Reference Books
a. Fundamentals of Mathematical Statistics, S.C. Gupta,V. K. Kapoor, S. Chand.
b. Probability, Statistics and Queuing Theory with Computer Applications-Arnold O.Allen, Academic press.

c. Introduction to Probability and Statistics, 12th edition, W. Mendenhall, R.J. Beaverand, B.M. Beaver, Thomson. (Indian edition)

d. Probability, Statistics and Queuing Theory, 2nd Edition, Trivedi, John Wiley and Sons.

MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

Course Code: GR17A2062   L:2 T:1 P:0 C:3

Unit-I
Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, Tautology, Equivalence implication, Normal forms.
Predicates: Predicative logic, Free and Bound variables, Rules of inference, Consistency, Proof of contradiction.

Unit-II
Set Theory: Properties of Binary Relations, Equivalence, Compatibility and partial ordering relations, Hasse diagram. Functions: Inverse Function, Composition of functions, Recursive Functions, Lattice and its Properties, Pigeon hole principle and its applications.

Algebraic structures: Algebraic systems, Examples and general properties, Semi groups and monoids, Groups, Sub groups, Homomorphism, Isomorphism.

Unit-III
Elementary Combinatorics: Basis of counting, Permutations and Combinations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial and Multinomial theorems, Principles of Inclusion – Exclusion.

Unit-IV
Recurrence Relation: Generating Functions, Function of Sequences, Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating functions, Characteristics roots solutions of In-homogeneous Recurrence Relations.

Unit-V
Graph Theory: Representation of Graphs, DFS, BFS, Spanning Trees, Planar Graphs

Graph Theory and Applications: Basic Concepts, Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers.

Teaching Methodologies
- Board
- Markers
- LCD Projector

Text Books
1. Discrete and Combinational Mathematics- An Applied Introduction-5th Edition – Ralph. P.Grimaldi, Pearson Education
2. Discrete Mathematical Structures with applications to computer science Trembly J.P. & Manohar .P, TMH
3. Mathematical Foundations for Computer Science Engineers, Jayant Ganguly, Pearson Education
4. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition.TMH.

Reference Books

1. Discrete Mathematics with Applications, Thomas Koshy, Elsevier
2. Discrete Mathematical Structures, Bernand Kolman, Roberty C. Busby, Sharn Cutter Ross, Pearson Education/PHI.
3. Discrete Mathematical structures Theory and application-Malik & Sen
4. Discrete Mathematics for Computer science, Garry Haggard and others, Thomson.
5. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker Prentice Hall.
6. Logic and Discrete Mathematics, Grass Man & Trembley, Person Education.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

DATABASE MANAGEMENT SYSTEMS

Course Code: GR17A2063   L:3 T:1 P:0 C:4

Unit-I

Database System Applications: Database System VS File System, View of Data, Data Abstraction, Instances and Schemas, Data Models: the ER Model, Relational Model, Other Models, Database System Structure, Database Users and Administrator, Transaction Management, Database design and ER diagrams, Attributes and Entity sets, Relationships and Relationship sets, Design Issues, Extended ER Features, Conceptual Design with the ER Model**,** Logical database design.

Unit- II

Relational Model: Introduction to the Relational Model, Basic Structure, Database Schema, Keys, Relational Algebra, Relational Calculus.Data on External storage, File organization and Indexing, cluster Indexes, Primary and Secondary Indexes, Index data structures, Hash based Indexing Tree based indexing.

Unit-III

Form of Basic SQL Query, Database Languages, DDL, DML, database Access for application Programs, Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries, Set Comparison Operators, Aggregative Operators, NULL values, Comparison using Null values, Logical connectivity: AND, OR and NOT, Impact on SQL Constructs, Outer Joins, Disallowing NULL values, Integrity Constraints over relations, Introduction to Views, Destroying /altering Tables and Views.

Unit-IV

Schema refinement: Problems Caused by redundancy, Decompositions, Problem related to decomposition, reasoning about FDS, FIRST, SECOND, THIRD Normal form, BCNF, Lossless join Decomposition, Dependency preserving Decomposition, Multi valued Dependencies, Fourth Normal Form.

Unit-V

Transaction Concept: Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability, Lock based Protocols, Timestamp based protocols, Validation based protocols, Multiple Granularity Recovery and Atomicity, Log based recovery, Recovery with concurrent transactions, Buffer Management.

Teaching Methodologies

- Power Point presentations
- Tutorial Sheets
- Assignments
- Lab experiments with Oracle Software

Text Books

1. "Data base Management Systems", Raghurama Krishnan, Johannes Gehrke, TATA Mc Graw Hill 3rd Edition
2. "Data base System Concepts", Silberschatz, Korth, McGraw hill, V edition.

Reference Books

1. "Introduction to Database Systems", C.J.Date Pearson Education.
2. "Database Systems design, Implementation, and Management", Rob & Coronel 5th Edition. Thomson.
3. "Database Management Systems", P. Radha Krishna HI-TECH Publications 2005.
4. "Database Management System", Elmasri Navate Pearson Education.
5. "Database Management System", Mathew Leon, Leo.

ADVANCED DATA STRUCTURES THROUGH C++

Course Code: GR17A2064   L:3 T:1 P:0 C:4

Unit-I

Introduction to OOP concepts, C++ class overview-class definition, objects, class members, constructors and destructors, Inline functions, static class members, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling.

Unit-II

Function overloading, operator overloading, Generic Programming: Function and class templates, inheritance basics, base and derived classes, inheritance types, this pointer, runtime polymorphism using virtual functions, streams I/O.

Unit-III

Priority Queues: Definition, ADT, realizing a priority queue using heaps, definition, insertion, deletion, application-heap sort.
Dictionaries: Linear list representation, operations-insertion, deletion and searching, Hash table representation-hash functions, collision resolution strategies-separate chaining and open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing.

Unit-IV

Trees: Binary search trees, definition, ADT, implementation, operations-searching, insertion and deletion, Tree Traversals Techniques-In-Order, Pre-Order & Post-Order.

Balanced search trees (part 1): AVL trees, definition, height of an AVL tree, representation, operations-insertion, deletion and searching, Red –Black trees operations-insertion,deletion and searching, splay trees .
Balanced search trees (part 2): Introduction to Red –Black trees and Splay Trees.

Unit-V

B-Trees: B-Tree of order m, height of a B-Tree, insertion, deletion and searching.
Graphs: Representation of Graphs, Graph Traversal Techniques –BFS & DFS.

Teaching Methodologies

- Power Point presentations
- White Board
- Tutorial Sheets
- Assignments

Text Books

1. "Data structures, Algorithms and Applications in C++",S.Sahni, University press (India)pvt ltd, 2nd edition, Orient Longman pvt.ltd.
2. "Object Oriented Programming with C++", E Balagurusamy, Mcgraw Hill Higher Education, Second edition

Reference Books

1. "Object Oriented Programming with C++", Subhash K U, Pearson
2. "Data structures and Algorithms in C++", Michael T.Goodrich, R.Tamassia and D.Mount, Seventh Edition Wiley student edition, John Wiley and Sons.
3. "Data Structures and Algorithms in C++", Third Edition, Adam Drozdek, Thomson
4. C++, The Complete Reference, 4th Edition, Herbert Schildt, TMH.

DIGITAL LOGIC DESIGN

Course Code: GR17A2065   L:3 T:1 P:0 C:4

Unit–I

Binary Systems: Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic.

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.

Unit–II

Gate-Level Minimization: The Map method, Four-variable map, Five-Variable map, Product of Sum's simplifications, Don't care conditions, NAND and NOR implementation, other two level implementations, Exclusive-OR Function.

Unit–III

Combinational Logic: Combinational Circuits, Analysis Procedure, Design Procedure, Binary Adder - Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

Unit–IV

Synchronous Sequential Logic: Sequential Circuits, Latches, Flip-Flops, Analysis of clocked sequential circuits, State Reduction and Assignment, Design Procedure.

Registers and Counters: Registers, shift registers, Ripple Counters, Synchronous Counters, other counters.

Unit–V

Memory and Programmable Logic: Introduction, Random Access Memory, Memory Decoding, Error Detection and Correction, Read Only Memory, Programmable Logic Array, Programmable Array Logic, Sequential Programmable Devices.

Hardware Description Language: Hardware Description Language, Definition, Structural Definition of HDL, HDL Models for Combinational circuits, HDL for Models for Sequential circuits.

Teaching Methodologies

- Power Point presentations
- Tutorial Sheets
- Assignments

Text Books

1. Digital Design – Fourth Edition, M. Morris Mano, Pearson Education.
2. Fundamentals of Logic Design – Roth, 5th Edition, Thomson.

References Books

1. Switching and Finite Automata Theory by ZviKohavi, Tata McGraw Hill.
2. Fundamentals of Digital Logic with VHDL Design, Stephen Brown, Zvonko Vranesic, Tata McGraw Hill, Indian edition.
3. Switching and Logic Design – CVS Rao, Pearson Education
4. Digital Principles and Design – Donald D.Givone, Tata McGraw Hill.
5. Fundamentals of Digital Logic and Micro Computer Design, 5th Edition, M.Rafiquzzaman (John Willey)

ADVANCED DATA STRUCTURES THROUGH C++ LAB

Course Code: GR17A2066   **L:0 T:0 P:2 C:2**

Task-1

Write C++ program to implement the following
    i.Constructors and destructors
    ii.Overloading constructors

Task-2

Write C++ program to implement the following variations of Friend Concepts
  i.   External Function declared as Friend
  ii.   Member Function declared as Friend
  iii.   One Class declared as Friend of another class.

Task-3

Write C++ program to implement the following
  i.   Function and Operator Overloading
  ii.   Function and Operator Overloading using FRIEND concept

Task-4

Write C++ program to implement Function and Class Templates

Task-5

Write a C++ program to implement
  i.   Single Inheritance
  ii.   Multiple Inheritance
  iii.   Multilevel Inheritance
  iv.   Hybrid Inheritance

Task-6

Write C++ program to implement Runtime Polymorphism.

Task-7

Write C++ program to implement the
  i.   Merge sort
  ii.   Heap sort

Task-8

Write a C++ program to implement Open addressing collision resolution strategies of Hashing
  i. Linear probing
  ii. Quadratic probing
  iii. Double Hashing

Task-9

Write a C++ program to perform the following operations:
  i.   Insert an element into a binary search tree.
  ii.   Delete an element from a binary search tree.
  iii.   Search for a key element in a binary search tree.

Task-10

Write C++ programs to implement Non-Recursive Tree Traversal techniques
- i. Preorder
- ii. Inorder
- iii. Postorder.

Task-11

Write C++ program to perform the following operations on AVL tree
- i. Insert an element
- ii. Delete an element from AVL tree
- iii. Search for a key element in an AVL tree

Task-12

Write C++ programs to Implement Graph Traversal Techniques
- i. BFS
- ii. DFS.

Teaching Methodologies
- Power Point presentation
- White Board

Text Books
1. Data structures, Algorithms and Applications in C++,S.Sahni,University press (India)pvt ltd, 2nd edition, Orient Longman pvt.ltd.

Course Code: GR17A2067   L:0 T:0 P:2 C:2

Task-1

DDL commands (Create, Alter, Drop,Truncate)

1. Create a table EMP with the following structure.

   Name_{Type}

EMPNO	NUMBER(6)
ENAME	VARCHAR2(20)
JOB	VARCHAR2(10)
MGR	NUMBER(4)
DEPTNO	NUMBER(3)
SAL	NUMBER(7,2)

2. Add a column commission to the emp table. Commission should be numeric with null values allowed.
3. Modify the column width of the job field of emp table.
4. Create dept table with the following structure. Name Type

DEPTNO	NUMBER(2)
DNAME	VARCHAR2(10)
LOC	VARCHAR2(10)

   DEPTNO as the primarykey

5. Add constraints to the emp table that is empno as the primary key and deptno as the foreign key.
6. Add constraints to the emp table to check the empno value while entering (i.e) empno> 100.
   Salary value by default is 5000, otherwise it should accept the values from the user.
   Add columns DOB to the emp table.
   Add and drop a column DOJ to the emp table.

Task-2: DML COMMANDS (Insert, Select, Update, Delete)

1. Insert 5 records into dept Insert few rows and truncate those from the emp1 table and also drop it.
2. Insert 11 records into emp table.
3. Update the emp table to set the default commission of all employees to Rs1000/- who are working as managers.
4. Create a table employee with the same structure as the table emp and insert rows into the table using select clauses.
5. Delete only those who are working as supervisors.
6. Delete the rows whose empno is 7599.
7. List the records in the emp table order by salary in ascending order.
8. List the records in the emp table order by salary in descending order.
9. Display only those employees whose deptno is 30.
10. Display deptno from the table employee avoiding the duplicated values.
11. List the records in sorted order of their employees.

12. Create a manager table from the emp table which should hold details only about the managers.
13. List the employee names and the department name in which they are working.

Task-3: SQL Operators

1. List all employee names , salary and 15% rise in salary.
2. Display the rows whose empno ranges from 7500 to 7600.
3. Display the rows whose empno not in range from 7500 to 7600.
4. Display all the employees in dept 10 and 20 in alphabetical order of names.
   a. List the employee names whose commission is null.
   b. Display all the details of the records whose employee name starts with 'S'.
   c. Display all the details of the records whose employee name does not start with 'M'.
   d. Display the names of employees whose second character is 'i'.
   e. Display all the details of the records whose employee name ends with 'A'.
   f. List all employees which starts with either B or C.
5. List out the employee names whose salary is greater than 5000 and less than 6000

Task-4: SQL Aggregate Functions, Group By clause, Having clause

1. Count the total records in the emp table.
2. Calculate the total and average salary of the employee.
3. Determine the max and min salary and rename the column as max-salary and min_salary.
4. Display total salary spent for employees.
5. Find no. of depts in employee table.
6. Display total salary spent for each job category.
7. Display lowest paid employee details under each manager.
8. Display highest paid employee details under each category.
9. Display job wise sum, average, max, min salaries.
10. Display maximum salaries of all the departments having maximum salary > 2000
11. Display average salaries for all departments having more than five employees.
12. Display job wise sum , avg , max , min salaries in department 10 having avg salary > 1000 and the result is ordered by sum of salary in descending order.

Task-5: SQL functions- Practice on Number functions, character functions, date functions, conversion functions and miscellaneous functions.

Task-6: Exercise on SQL Functions.

1. Display the employee name concatenate with employee no.
2. Display half of emp name in upper case and half in lower case.
3. Display the month name of date "14-jul-09" in full.
4. Display the Dob of all employees in the format "dd-mm-yy".
5. Display the date two months after the Dob of employees.
6. Display the last date of that month in "05-Oct-09".
7. Display the rounded date in the year format, month format, day format in the employee
8. Display the date 60 days before current date.
9. Display the employee names whose name contains up to 5 characters.
10. Display the names and dob of all employees who were born in February.
11. List out the employee names who will celebrate their birthdays during current month.

Task-7: Nested Queries

1. Find the third highest salary of an employee.
2. Display all employee names and salary whose salary is greater than minimum salary of the company and job title starts with 'M'.
   3. Write a query to find all the employees who work in the same job as Jones.

4. Write a query to display information about employees who earn more than any employee in dept 30.
5. Display the employees who have the same job as Jones and whose salary >=Fords
6. Write a query to list the employees in dept 20 with the same job as anyone in dept 30.
7. List out the employee names who get the salary greater than the maximum salaries of dept with dept no 20, 30.
8. Display the maximum salaries of the departments whose maximum salary is greater than 9000.
9. Display the maximum salaries of the departments whose minimum salary is greater than 1000 and lesser than 5000.

Task-8: Joins, Set Operators.
1. Display all the employees and the departments implementing a left outer join.
2. Display the employee name and department name in which they are working implementing a right outer join.
3. Display the employee name and department name in which they are working implementing a full outer join.
4. Write a query to display their employee names and their managers salary for every employee.
5. Write a query to output the name, job, empno, deptname and location for each dept, even if there are no employees.
6. Find the name of the manager for each employee.
7. Display the details of those who draw the same salary.
8. Display all the dept numbers available with the dept and accdept tables avoiding duplicates.(Create accdept table with the following attributes: dept no, empno, loc)
9. Display all the dept numbers available with the dept and accdept tables.
10. Display dept no available in both the dept and accdept tables

Task-9: Views
1. Display only the details of the employees those who are managers.
2. Display only the details like empno, empname, deptno, deptname of the employees
3. Display only the details like empno, empname, deptno, deptname of the all the employees except the HOD and CEO.
4. Display all the views generated.
5. Execute the DML commands on the view created.
6. Drop a view.

Task-10: Practices on DCL commands.
Task-11: Practices on Sequence and indexes.
Task-12: Design a Conceptual Database design and Logical Data design for Hospital Management System.

Text Books
1. The Complete Reference,3rd edition by James R.Groff, Paul N.Weinberg, Andrew J. Oppel
2. SQL & PL/SQL for Oracle10g, Black Book, Dr.P.S.Deshpande.

DIGITAL LOGIC DESIGN LAB

Course Code: GR17A2068   L:0 T:0 P:2 C:2

A. COMBINATIONAL CIRCUITS

1. Realization of Gates (AND, OR, NOT, NAND, NOR)
   Exercise: Realize an XOR and XNOR gates
2. Design half adder and full adder using Gates
   Exercise: Design half subtractor circuit
3. Verification of four bit magnitude comparator
   Exercise: Verify an 8bit magnitude comparator
4. Design a 2 to 1 Multiplexer
   Exercise: Implement a 4 to 1 Multiplexer.
5. Design a 2 to 4 Decoder and 1 to 4 Demultiplexer
   Exercise: Implement a 3 to 8 decoder and design a 1 to 4 demultiplexer using 1 to 2 demultiplexer.
6. Design a 4 bit Parity Checker
   Exercise: Design a 4 bit Parity Generator.

B. SEQUENTIAL CIRCUITS

1. Verification of truth tables of D and T Flip-Flops
   Exercise: Verify JK Flip-Flop

2. Conversion of JK Flip-Flop to D Flip-Flop
   Exercise: Convert JK Flip-Flop to T Flip-Flop

3. Design of 8 bit left Shift Register
   Exercise: Design a 4 bit right shift Register

4. Design a Binary Counter
   Exercise: Design of Decade Counter

5. Design of Asynchronous Up Counter
   Exercise: Design an Asynchronous mod Counter

6. Design of Synchronous Down Counter
   Exercise: Design a Synchronous Up/Down Counter

C. HARDWARE DESCRIPTION LANGUAGE

1. Simulation of Logic Gates
2. Simulation of any given Boolean Expression. Example: Y = A'B + AB'C'
3. Simulation of Multiplexers, Comparators and Decoders.
4. Simulation of Sequential Counter.

Note: A minimum of 12 experiments are to be performed and recorded by the candidate to attain eligibility for practical examination.

Text Books

1. Digital Design-Fourth Edition,M.Morris Mano,Pearson Education.
2. Fundamentals of Logic Design-Roth, 5th Edition, Thomson.

References Books

1. Switching and Finite Automata Theory by ZviKohavi, Tata McGraw Hill.
2. Fundamentals of Digital Logic with VHDL Design, Stephen Brown, Zvonko Vranesic, Tata McGraw Hill, Indian edition.
3. Switching and Logic Design – CVS Rao, Pearson Education
4. Digital Principles and Design – Donald D.Givone, Tata McGraw Hill.
5. Fundamentals of Digital Logic and Micro Computer Design, 5th Edition, M.Rafiquzzaman (John Willey)

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENVIRONMENTAL SCIENCE

Course Code: GR17A2001   L:0 T:0 P:2 C:2

Prerequisites: Basic knowledge on basic sciences and natural resources

Unit-I

Introduction to Environment, Ecology and Ecosystems: Definition, Scope and Importance ecosystem, public awareness and Participation, Ecology, Concept of ecosystem, Classification of ecosystem, Structure , components and function of ecosystem, Typical ecosystem, Food chain, Food web, Biodiversity-Types and Values, biogeochemical cycles.

Unit–II

Natural Resources: Definition, Occurrence, Classification of resources, Important Natural Resources for Human society, Utilization-Positive and negative effects of water resources, Mineral resources, forest resources, Energy resources, Land resources, renewable and non-renewable resources.

Unit-III

Environmental Pollution: Definition, Classification of pollution, Types of pollution and pollutants, Cause, effects and control of Air pollution, water pollution, Soil pollution, Noise pollution, Thermal and Nuclear pollution.
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Unit-IV

Environmental Problems and Management Policies: Natural Disasters-Types, Causes and Effects, Global warming, climate change-EI NiNo-La Nina, Ozone layer-location, role and degradation, Deforestation and desertification, Green belt Development, Rain water harvesting, Renewable and alternative resources.

Unit-V

National Policy on Environment Protection and Sustainability: Air (pollution and prevention) act 1981, Water(Pollution and prevention) Act 1974, Pollution Act 1977, Forest conservation Act; wild life protection act; Municipal solid waste management and handling Act, Hazardous waste management and handling rules, Role of IT in environment, environmental ethics, environmental economics.

Sustainable development: cause and threats to sustainability, stratagies for achieving sustainable development, Concept of green buildings and clean development Mechanism (CDM).

Teaching Methodology
- White board and marker
- OHP and Field visit

Text Books
1. Text Book of Environmental Studies, Erach Barucha. University Press
2. Text book of Environmental Science and Technology by M.Anji Reddy 2007

Reference Books

1. Biotechnology & Environmental Chemistry. Surinder Jeswal& Anupama Deswal, DhanpatRai & Co Pvt. Ltd.
2. A Text Book of Environmental Science. Aravind Kumar. APH Publishing Corporation.
3. Glimpses of Environment. Dr. KVSG. Murali Krishna. Environmental Protection Society

II SEMESTER

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Code: GR17A2104   L:2 T:1 P:0 C:3

Unit-I

Introduction & Demand Analysis: Definition and Scope: Definition, Nature and Scope of Managerial Economics.

Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Marginal and Incremental Analysis; Basic Calculus: The Calculus of Optimization.

Unit-II

Production & Cost Analysis: Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale. Cost Analysis: Cost concepts. Determinants of Costs – Cost Forecasting - Short Run and Long Run Costs –Type of Costs - Analysis of Risk and Uncertainty.

Unit-III

Markets & New Economic Environment: Types of competition and Markets. Business: Features and evaluation of different forms of Business Organisation: Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types. New Economic Environment: Changing Business Environment in Post-liberalization scenario. Privatization and Globalization - Business and Government - Public-Private Participation (PPP) - Industrial Finance - Foreign Direct Investment(FDIs).

Unit-IV

Capital Budgeting: Capital: Capital Budgeting: Capital: Capital and its significance, Types of Capital. Methods and sources of raising capital. Management of Current Assets : Management of Receivables , Management of Cash , Management of Marketable Securities and Management of Inventory Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method .

Unit-V

Introduction to Financial Accounting & Financial Analysis: Introduction to Financial Accounting & Financial Analysis. Accounting Cycle: Journal, Ledger, Trial Balance, Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Tools for Financial Statement Analysis: Comparative statements, common size statements, cash flow analysis, ratio analysis- Analysis and Interpretation of Liquidity Ratios, Activity Ratios, Capital structure Ratios and Profitability ratios. DuPont Chart.

Teaching Methodologies

- Lectures
- Power Point presentations
- Seminars
- Working out problems on black/white boards
- Conducting tutorials

Text Books

1. **Aryasri:** Managerial Economics and Financial Analysis, TMH, 2009.
2. **Atmanand:** Managerial Economics, Excel, 2008.

Reference Books

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.2009
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, PHI, 2009
3. Lipsey & Chrystel, Economics, Oxford University Press, 2009

OPERATING SYSTEMS

Course Code: GR15A2069   L:3 T:1 P:0 C:4

Unit-I

Computer System and Operating System Overview: Overview of computer operating systems, operating systems functions, protection and security, distributed systems, special purpose systems, operating systems structures and system calls, operating systems generation

Unit-II

Process Management: Process concepts**,** threads, scheduling-criteria**,** algorithms, their evaluation, Thread scheduling, case studies**:** Linux, Windows

Concurrency: Process synchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions. Case studies**:** Linux, Windows

Unit-III

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page replacement algorithms, Case studies**:** Linux, Windows, Principles of deadlock – system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock.

I/O systems: Hardware, application interface, kernel I/O subsystem, Transforming I/O requests, Hardware operation, performance.

Unit-IV

File system Interface: The concept of a file, Access Methods, Directory structure, file sharing, protection. File System implementation- File system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance.

Mass-storage structure: Overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management, RAID structure, stable-storage implementation, Tertiary storage structure.

Unit-V

Protection: Protection, Goals of Protection, Principles of Protection, Domain of protection, Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability-Based systems, Language – Based Protection, Security- The Security problem, program threats, system and network threats, cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer – security classifications.

Teaching Methodologies
- Power Point presentations
- Tutorial Sheet
- Assignments

Text Books

1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.

2. Operating Systems- Internal and Design Principles Stallings, Fifth Edition–2005, Pearson education/PHI

References Books

1. Operating systems- A Concept based Approach-D. M. Dhamdhere, 2nd Edition, TMH
2. Operating System A Design Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI.

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Course Code: GR15A2070   L:3 T:1 P:0 C:4

Unit-I

Introduction: OOP concepts, history of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program.

Classes and Objects: concepts of classes, objects, constructors, methods, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion.

String handling: String, StringBuffer, StringTokenizer.

Unit-II

Inheritance: base class object, subclass, member access rules, super uses, using final with inheritance, method overriding, abstract classes.

Interfaces: defining an interface, implementing interface, differences between classes and interfaces and extending interfaces.

Packages: Defining, creating and accessing a package, importing packages, access control, exploring package - java.io

Unit-III

Exception handling: concepts of exception handling, benefits of exception handling, exception hierarchy, checked and unchecked exceptions, usage of-try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.

Multithreading: differences between multi-threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

Unit-IV

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

Event Handling: events, event sources, event classes, event listeners, delegation event model, handling mouse and key board events, adapter classes. The AWT class hierarchy, user interface components-labels, buttons, canvas, scrollbars, text components, checkbox, checkbox groups, choices, lists.

Unit-V

Layout manager: layout manager types-border, grid, flow, card and grid bag**.**

Swing: Introduction, limitations of AWT, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, Text fields, buttons – The JButton class, Checkboxes, Radio buttons, Combo boxes, Tabbed Panes, ScrollPanes, Trees and Tables.

Teaching Methodologies

   White-board, marker, power point presentations

Text Books

1. Java The complete reference, 8th editon, Herbert Schildt, TMH.
2. Understanding OOP with Java, up dated 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 OOP, second edition, T. Budd, pearson education.
3. Introduction to Java programming 6th edition, Y. Daniel Liang, pearson education.
4. An introduction to Java programming and object oriented application development, R. A. Johnson-Thomson

FORMAL LANGUAGES AND AUTOMATA THEORY

Course Code: GR17A2071   L:3 T:1 P:0 C:4

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 transitions - significance, acceptance of languages.

Conversions and Equivalence: Equivalence between NFA with and without transitions, NFA to DFA conversion, minimisation of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Melay 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.

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.

Unit-IV
Context Free Grammars: Ambiguity in context free grammars, Minimisation of context free grammars, Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages, Enumeration of properties of CFL.
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. 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.
Computability Theory: Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of problems, Universal Turing Machine, undecidability of posts correspondence problem, Turing reducibility, definition of P and NP problems, NP complete and NP hard problems.

Teaching Methodologies
- Board
- Markers
- LCD Projector.

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. and Papadimition C.H. Pearson /PHI.

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

COMPUTER ORGANIZATION

Course Code: GR17A2076   L:2 T:1 P:0 C:3

Unit-I

Basic Structure of Computers: Computer Types, Functional unit, Data Representation, Fixed Point Representation, Floating – Point Representation, Error Detection codes.

Register Transfer Language and Micro operations: Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro operations, Logic micro operations, Shift micro operations, Arithmetic logic shift unit.

Unit-II

Basic Computer Organization and Design: Instruction codes, Computer Registers, Computer instructions, Timing and Control, Instruction cycle, Memory Reference Instructions, Input – Output and Interrupt, Complete Computer Description.

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

Unit-III

Central Processing Unit Organization: General Register Organization, STACK organization, Instruction formats, Addressing modes, DATA Transfer and manipulation, Program control, Reduced Instruction Set Computer.

Computer Arithmetic: Addition and subtraction, multiplication Algorithms, Floating – point Arithmetic operations, BCD Adder.

Unit-IV

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

Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, Dependencies, Vector Processing.

Unit-V

Memory Organisation: Memory Hierarchy, Main memory- RAM and ROM chips, Memory Address map, Auxiliary memory – Magnetic Disks, Magnetic Tapes, Associative Memory – Hardware Organization, Match Logic, Cache Memory – Associative mapping, Direct mapping, Set associative mapping, Writing into cache and cache initialization, Cache Coherence, Virtual memory – Address Space and Memory Space, Address mapping using pages, Associative Memory page table, Page Replacement.

Multi Processors: Characteristics or Multiprocessors, Interconnection Structures, Cache Coherence, Shared Memory Multiprocessors.

Teaching Methodologies
- Power Point Presentations
- Tutorial Sheets
- Assignments

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

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 or 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 Publications.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

Course Code: GR17A2072   L:0 T:0 P:2 C:2

Recommended Systems/Software Requirements

Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB
RAM and 100 MB free disk space JDK Kit. Recommended

Task-1: Write java programs that implement the following
i.   Constructor
ii.   Parameterized constructor
iii.   Method overloading
iv.   Constructor overloading.

Task-2

i.   Write a Java program that checks whether a given string is a palindrome or not.
          Ex: MADAM is a palindrome.
ii.   Write a Java program for sorting a given list of names in ascending order.
iii. Write a Java Program that reads a line of integers, and then displays each integer and
the sum of all the integers (Use StringTokenizer class of java.util)

Task-3: Write java programs that uses the following keywords
i.   this
ii.   super
iii. static
iv.   final

Task-4

i. Write a java program to implement method overriding
ii. Write a java program to implement dynamic method dispatch.
iii.Write a Java program to implement multiple inheritance.
iv.Write a java program that uses access specifiers.

Task-5

i.   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.
ii.   Write a Java program that reads a file and displays the file on the screen, with a line
      number before each line.
iii.   Write a Java program that displays the number of characters, lines and words in a text
      file

Task-6
    i. Write a Java program for handling Checked Exceptions.
    ii. Write a Java program for handling Unchecked Exceptions.

Task- 7
    i.   Write a Java program that creates three threads. First thread displays "Good Morning" every one second, the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every three seconds.
    ii.   Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

Task-8
    i.   Develop an applet that displays a simple message.
    ii.   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.

Task-9
    Write a Java program that works as a simple calculator. Use a grid layout to arrange button for the digits and for the +, -,*, % operations. Add a text field to display the result.

Task-10
    i.   Write a Java program for handling mouse events.
    ii.   Write a Java program for handling key events.

Task-11
    Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields Num1 and Num 2.
The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1or Num2 were not an integer, the program would throw Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception and display the exception in a message dialog box.

Task-12
    i.   Write a java program that simulates traffic light. The program lets the user select one of three lights: red, yellow or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No l Light is on when the program starts.
    ii.   Write a Java program that allows the user to draw lines, rectangles and ovals.

Task -13
Create a table in Table.txt file such that the first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using JTable component.

Text Books
    1. Java; The complete reference, 8th editon ,Herbert Schildt, TMH.

    2. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.
    3. Introduction to Java programming, Sixth edition, Y.Daniel Liang, Pearson Education.
    4. Big Java, 2nd edition, Cay Horstmann, Wiley Student Edition, Wiley India Private Limited

OPERATING SYSTEMS LAB

Course Code: GR17A2073   L:0 T:0 P:2 C:2

Task-1
Simulate the following CPU scheduling algorithms
a) Round Robin   b) SJF   c) FCFS   d) Priority

Task-2
Simulate the Producer-Consumer Problem.

Task-3
Simulate the Readers-Writers Problem using Semaphore.

Task-4
Simulate the Dinning Philosophers Problem.

Task-5
Simulate MVT and MFT.

Task-6
Simulate First Fit and Best Fit algorithms for memory management.

Task-7
Simulate Paging Technique of memory management.

Task-8
Simulate all page replacement algorithms
a) FIFO   b) LRU   c) LFU

Task-9
Simulate Bankers Algorithm for Dead Lock Avoidance.

Task-10
 Simulate all file allocation strategies
a) Sequential   b) Indexed   c) Linked
Task-11
Simulate all File Organization Techniques
a) Single level directory   b) Two level directory

Task-12
Simulate the following Disk Scheduling Algorithms
 a) First Come-First Serve (FCFS)
 b) Shortest Seek Time First (SSTF)
 c) Elevator (SCAN)
 d) Circular SCAN (C-SCAN)

e) LOOK
f) C-LOOK

Text Books

1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Operating Systems – Internal and Design Principles Stallings, Fifth Edition–2005, Pearson education/PHI.

ADVANCED DATABASES LAB

Course Code: GR17A2074   L:0 T:0 P:2 C:2

PL/SQL

Recommended Systems/Software Requirements:
- Intel based desktop PC
- Mysql/Oracle latest version Recommended

Task-1

i. Write a PL/SQL program to find sum of two numbers.
ii. Write a PL/SQL program for finding Multiples of 5.
iii. Write a PL/SQL program for display the Multiplication Tables up to given number.
iv. Write a PL/SQL program to generate reverse for given number.
v. Write a PL/SQL program to find whether a given number is prime or not.

Task-2

i. Write a PL/SQL block using string functions
ii. Write a PL/SQL program to print a string in a letter by letter format.
iii. Write a PL/SQL program to insert a space after each letter in a given string.
iv. Write a PL/SQL program to print the number of products from product table whose prices are between 0 to 50, 50 to 100,100 to 150, 150 to 200, 200 to 250.
v. Write a PL/SQL program to calculate the student grade using case statement.

Task-3

i. Write a PL/SQL to display the employee details using %type data type.
ii. Write a PL/SQL to display the employee details using %row type data type.
iii. Write a PL/SQL code to retrieve the employee name, join_date, and designation from employee database of an employee whose number is input by the user.
iv. Write a PL/SQL code to calculate tax for an employee of an organization.

Task-4

i. Write a PL/SQL program to display employee details using cursors.
ii. Write a PL/SQL program to display top 10 employee details based on salary using cursors.
iii. Write a PL/SQL program to display student mark list using cursors.
iv. Write a PL/SQL program to update the salary of employees who earn less than the average.

Task-5

i. Write a PL/SQL program to update the commission values for all employees with salary less than 2000 by adding Rs.1000 to existing employees.
ii. Write a PL/SQL code to calculate the total salary of first n records of employee table. The value of n is passed to cursor as parameter.

Task-6
    i. Write a row trigger to insert the existing values of the salary table in to a new table when the salary table is updated.
    ii. Write a trigger on the employee table which shows the old values and new values of ename after any updations on ename on Employee table.

Task-7
       Write a PL/SQL procedure for inserting, deleting and updating an employee table .
Write a PL/SQL procedure to find the number of students ranging from 100-70%, 69-60%, 59-50% & below 49% in each course from the student_course table given by the procedure as parameter.

Task-8
    i. Create a PL/SQL function that accepts 2 numbers and returns the addition of passed values. Also Write the code to call your function.

    ii Write a PL/SQL function that accepts department number and returns the total salary of the department. Also Write a function to call the function.

Task-9
    i. Write a PL/SQL program to handle predefined exception.
    ii. Write a PL/SQL program to handle user defined exception.

Task -10
Write a PL/SQL code to create
    Package specification
    Package body For the insert, retrieve, update and delete operations
    on a student table.

Task -11
    i.   Develop banking application by performing the following:
    ii.   Create customer and transaction tables.
    iii.   Write a procedure to Insert and delete the values in the customer table.
    iv.   Write a procedure to update the customer table based on the transactions in the transaction table.

Text Books
1. "ORACLE PL/SQL by example", Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Edition
2. "ORACLE DATABASE LOG PL/SQL Programming", SCOTTURMAN, Tata Mc-GrawHill.
3. "SQL & PL/SQL for Oracle 10g", BlackBook, Dr.P.S. Deshpande.

GOKARAJU
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INSTITUTE OF ENGINEERING AND TECHNOLOGY

VALUE EDUCATION AND ETHICS

Course Code: GR17A2002   **L:0 T:0 P:2 C:2**
Unit-I

Values and self-development –social values and individual attitudes, Work ethics, Indian vision of Moral and non-moral valuation, Standards and principles. Importance of cultivation of values, Sense of duty, Devotion, Self-reliance, Confidence, Concentration, Truthfulness, Honesty, Humanity, and National unity. .Basic manners-courtesy, respect; humility, modesty, politeness Discovery and acceptance of one's own abilities, talents, strengths/ weaknesses; optimism to face challenges with hope and resilience.

Unit-II

Personality and Behavior Development-God and scientific attitude, Positive thinking, Integrity and discipline, Punctuality, Love and Kindness, Avoiding fault finding, Free from anger, Dignity of labor, Universal brotherhood and religious tolerance, True friendship, Happiness Vs suffering,Doing best, Saving nature.SWOT Analysis, Who am I, Attributes, Importance of Self Confidence, Self Esteem.

Unit-III

Character and Competence-Science Vs God, Holy books Vs blind faith, Self-management and good health, Equality:Social equality, Economic equality, Egalitarianism, Equality before the law, Equal opportunity, Racial equality
All religions and same message, Mind your mind, Self-control, Honesty, Studying effectively.

Unit-IV

Professional consciousness Ethics: Ethical Human conduct, Development ofhuman consciousness, Holistic technologies, Universal human order, Code of conduct.Professional Ethics and Information Professions, Ethlcal Principles and Professional Relationships
Unit-V

Legislative procedures: Supreme Court and High Courts-jurisdiction, powers, appointment and transfer of judges; Separation of Powers; Distribution of Legislative and Administrative Powers between Union and States
Rights and Rules, Human Rights, Copy rights, IPR, RTI Act, Lokpal.

Text Books

1. Chakraborty,S.K., Values and Ethics for Originations Theory and Practice, Oxford University Press, New Delhi, 2001
2. R R Gaur, R Saugal, G P Bagaria, "A foundation course in Human values and Professional Ethics", Excel books, New Delhi, 2010.

Reference Books

1. Frankena, W.K., Ethics, Prentice Hall of India, New Delhi, 1990.
2. Kapoor, S.K., Human rights under International Law and Indian Law, Prentice Hall of India, New Delhi, 2002.

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GENDER SENSITIZATION LAB

Course Code: GR17A2106   L:0 T:0 P:2 C:2

Unit-I
UNDERSTANDING GENDER: Gender: Why should we study it? (Towards a world of Equals: Unit – 1) Socialization: Making women, making men (Towards a World of Equals: Unit -2) Introduction. Preparing for Womanhood.Growing up Male.First lessons in Caste.Different Masculinities.Institutional/System Influences on Gender Stereotypes Legal and Political Frameworks for Gender Equality

Unit-II
GENDER AND BIOLOGY: Missing Women: Sex Selection and its Consequences (Towards a World of Equals: Unit – 4) Declining Sex Ratio. Demographic Consequences. Gender Spectrum: Beyond the Binary (Towards a World of Equals: Unit – 10) Two or Many? Struggles with Discrimination. Developmental changes in the female, Reproductive Health, Special Health Risks to Women and Ethical concerns in Women's Health

Unit-III
GENDER AND LABOUR: Housework: the Invisible Labour(Towards a World of Equals: Unit – 3) "My Mother doesn`t Work". "Share the Load". Women`s Work: Its Politics and Economics (Towards a World of Equals: Unit – 7) .Gender equality and the world of work, Gender and working poverty and Gender dimensions of various key labour market indicators.

Unit-IV
ISSUES OF VIOLENCE: Sexual Harassment: Say No! (Towards a World of Equals: Unit – 6) Sexual Harassment, not Eve – teasing – Coping with Everyday Harassment – Further Reading: "Chupulu" Domestic Violence: Speaking Out (Towards a World of Equals: Unit – 8) Is Home a Safe Place? – When Women Unite [Film]. Rebuilding Lives. Further Reading. Wife battering.,Domesticabuse.,Intimate Partner Violence (IPV),Family violence.,Relationshipviolence.,Spousal violence and Dating violence.

Unit-V

GENDER STUDIES: Knowledge: Through the Lens of Gender (Towards a World of Equals: Unit – 5) Point of View. Gender and the Structure of Knowledge. Further Reading. Unacknowledged Women Artists of Telangana. Whose History? Questions for Historians and Others (Towards a World of Equals: Unit – 9) .Abortion rights,Femicide, Femme invisibility,First-wave feminism, Heterosexual transvestites, Partial-birth abortion, Radical feminism, Same-sex marriage and Women's suffrage

Text Books
1. Towards a World of Equals: A Bilingual Textbook on Gender" Telugu Akademi, Hyderabad Written by A. Suneetha, Uma Bhrugubanda, DuggiralaVasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, GoguShyamala, Deepa Sreenivas and Susie Tharu.

2. Sen, Amartya. "More than Once Million Women are Missing". New York Review of Books 37.20 (20 December 1990). Print. `We Were Making History……' Life Stories of Women in the Telangana People`s Struggle. New Delhi : Kali for Women, 1989.
3. TriptiLahiri. "By the Numbers: Where India Women Work." Women`s Studies Journal (14 November 2012) Available online at: http://blogs. Wsj.com/India real time/2012/11/14/by
– the –numbers – where- Indian- women-work.
4. K. Satyanarayana and Susie Tharu (Ed.) Steel Nibs Are Sprouting: New Dalit Writing

   From South India, Dossier 2: Telugu And Kannada
http://harpercollints.co.in/BookDetail.asp?Book Code=3732

Reference Books
1. Vimala "Vantilu (The Kitchen)". Omen Writing in India: 600BC to the Present, Volume II The 20th Century. Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 599-601.
2. Shatrughna, Veena et al. Women`s Work and its Impact on Child Health and Nutrition, Hyderabad, National Institute of Nutrition, India Council of Medcial Research 1993. B.Tech (ANE) R-15 Malla Reddy College of Engineering and Technology (MRCET) 113
3. Stress Shakti Sanghatana. "We Were Making History….'Life Stories of Women in the Telangana People`s Struggle. New Delhi:Kali of Women, 1989.
4. Menon, Nivedita. Seeing Like a Feminist. New Delhi. Zubaan-Penguin Books, 2012.
5. Jayaprabha, A. "Chupulu (Stares)". Women Writing in India: 600BC to the Present. Volume II: The 20th Century Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 596-597.
6. Javeed, Shayam and AnupamManuhaar. "Women and Wage Discrimination in India: A Critical Analysis". International Journal of Humanilities and Social Science Invention 2, 4(2013).
7. Gautam, Liela and Gita Ramaswamy. "A 'Conversation' between a Daughter and Mother". Broadsheel on Contemporany Politics. Special Issue on Sexuality and Harassment: Gender Politics on Campus Today. Ed.Madhumeeta Sinha and Asma Rasheed. Hydrabad: Anveshi research Center for Women`s Studies, 2014.
8. Abdulali Sohaila. " I Fought For My Life…and Won." Available online at: http://www.thealternative. In/lifestyle/i-fought-for-my lifeand-won-sohaila-abdulal/
9. Jeganathan Pradeep, Partha Chatterjee (Ed). "Community, Gender and Violence Subaltern Studies XI". Permanent Block and Ravi Dayal Publishers, New Delhi, 2000
10. K. Kapadia. The Violence of Development: The Politics of Identity, Gender and Social Inequalities in India. London: Zed Books, 2002.
11. S. Benhabib. Situating the self: Gender, Community, and Postmodernism in Contemporary Ethics, London: Routledge, 1992.
12. Virginia Woolf A Room of One`s Oxford: Black Swan. 1992.
13. T. Banuri and M. Mahmood, Just Development: Beyond Adjustment with a Human Face