ACADEMIC REGULATIONS
PROGRAM STRUCTURE
and
DETAILED SYLLABUS

Bachelor of Technology
(Information Technology)

(Effective for the students admitted from the Academic Year 2017-18)

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(Autonomous)

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

Gokaraju Rangaraju Institute of Engineering andTechnology 2017 Regulations (GR17 Regulations) are given hereunder. These regulations govern the programmes offered by the Department of Information Technology 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 Information Technology, 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 Information Technology 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/Universityor 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) andCGPA (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.TechDegree:** A student will be declared eligible for the award ofB. 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.Techin Information Technologyshall 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 detained 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 OrientedMini 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 theroad show at the department level for the benefit of all students and staff and the same is to be evaluated by Mini Project Review Committeefor 10 marks. The mini project report shall be presented before Project ReviewCommittee 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 conductedby 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 andprepare atechnical report and present the same to a Committee consisting of HODand

twoseniorfaculty and the seminarcoordinator of the department. The student shall be assessed for his/her understanding of the topic, its application and its relation with various coursesstudied during the programme of studyfor**50 marks.**

g) **Major Project:** Theproject work is evaluated for 200 marks.Out of 200,50 marksshall be for internal evaluation and 150 marksfor 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.

. 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	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	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 k^{th} semester(1 to 8)is the ratio of sum of the product of the number of credits and grade points to the total creditsof all courses registered by a student, i.e.,**

$$SGPA(S_k) = \sum_{i=1}^{n} (Ci * Gi) / \sum^{n}_{i=1} Ci$$

Where C_i is the number of credits of the i^{th}course and $G_i$is the grade point scored by the student in the i^{th} 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 $k \geq 2$.**

$$CGPA = \sum_{i=1}^{m} (Ci * Gi) / \sum^{m}_{i=1} Ci$$

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 classesbased 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 $\geq$ 6.50and CGPA < 8.00
14.4	Second Class	CGPA $\geq$ 5.50 and CGPA < 6.50
14s.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 registerfor all 144 credits and secure allcredits. 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 ofthe 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**

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
B.Tech (IT) PROGRAMME STRUCTURE

I B.Tech (IT) **I Semester**

Group	Sub-Code	Subject	L	T	P	Credits	Hours	Int.	Ext.	Marks
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
HS	GR17A1005	English	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
ES	GR17A1019	Fundamentals of Electronics Engineering	3	1	-	4	5	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	**13**	**6**	**6**	**25**	**37**	**255**	**570**	**825**

I B.Tech (IT) **II Semester**

Group	Sub-Code	Subject	L	T	P	Credits	Hours	Int.	Ext.	Marks
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
ES	GR17A1018	Basic Electrical Engineering	3	1	-	4	5	30	70	100
BS	GR17A1008	Engineering Chemistry	2	1	-	3	4	30	70	100
ES	GR17A1023	Engineering Graphics	1	-	2	3	5	30	70	100
ES	GR17A1010	Data Structures	2	1	-	3	4	30	70	100
ES	GR17A1026	IT Workshop	-	-	2	2	4	25	50	75
BS	GR17A1030	Engineering Chemistry lab	-	-	2	2	4	25	50	75
HS	GR17A1024	Business Communication and Soft Skills	-	-	2	2	4	25	50	75
		Total	**12**	**5**	**8**	**25**	**38**	**255**	**570**	**825**

II B.Tech (IT) **I Semester**

Group	Sub-Code	Subject			P	Credits	Hours	Int.	Ext.	Marks
BS	GR17A2011	Probability and Statistics	2	1	-	3	4	30	70	100
PC	GR17A2062	Mathematical Foundation of Computer Science	3	1	-	4	5	30	70	100
PC	GR17A2063	Database Management Systems	3	1	-	4	5	30	70	100
PC.	GR17A2064	Advanced Data structures through C++	3	1	-	4	5	30	70	100
PC	GR17A2065	Digital Logic Design	3	1	-	4	5	30	70	100
PC	GR17A2066	Advanced Data structures Through C++ Lab	-	-	2	2	4	25	50	75
PC	GR17A2053	Digital Electronics Lab	-	-	2	2	4	25	50	75
PC	GR17A2075	Database Management Systems Lab	-	-	2	2	4	25	50	75
		Total	**14**	**5**	**6**	**25**	**36**	**225**	**500**	**725**
MC	GR17A2001	Environmental Science	-	-	2	2	4	30	70	100

II B.Tech (IT) **II Semester**

Group	Sub-Code	Subject	L	T	P	Credits	Hours	Int.	Ext.	Marks
HS	GR17A2104	Managerial Economics and Financial Analysis	2	1	-	3	4	30	70	100
PC	GR17A2076	Computer Organization	3	1	-	4	5	30	70	100
PC	GR17A2069	Operating Systems	3	1	-	4	5	30	70	100
PC	GR17A2070	Object Oriented Programming through Java	3	1	-	4	5	30	70	100
PC	GR17A2077	Computer Networks	3	1	-	4	5	30	70	100
PC	GR17A2072	Object Oriented Programming through Java Lab	-	-	2	2	4	25	50	75
PC	GR17A2078	Operating systems and Computer Networks Lab	-	-	2	2	4	25	50	75
PC	GR17A2079	Web Designing Lab	-	-	2	2	4	25	50	75
		Total	**14**	**5**	**6**	**25**	**36**	**225**	**500**	**725**
MC	GR17A2002	Value Education and Ethics	-	-	2	2	4	30	70	100
MC	GR17A2106	Gender Sensitization Lab	-	-	2	2	4	25	50	75

SYLLABUS
I-Year

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

Course objectives: The objective of this course is to provide the student with

- Introduce the ideas of linearity and linear systems, which lie at the core level of many engineering concepts
- Explore the extensions of differential calculus, which form the stepping stones to a broader subject called "approximation theory"
- Learn the skill of seeing a mathematical equation in many commonly occurring natural phenomena and acquire preliminary skills to predict their behavior
- Provide an over view of mean value theorems and its applications
- Discuss the significant applications of higher order differential equations.

Course Outcomes: At the end of the course, the student will be able to

- Recognize the concepts of matrix rank to analyze linear algebraic systems
- Compute eigen values and vectors for engineering applications
- Illustrate the concepts of Mean Value Theorems to Describe the Medical Imaging and Industrial Automation.
- Differentiate various differential equations using elementary techniques (Exact or linear constant coefficient equations)
- Demonstrate model and solve linear dynamical systems
- Apply concepts of higher order differential equations to solve typical problems in Electrical circuits.
- Identify the physical phenomena of Simple harmonic motion by concepts of Differential equations.

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 trajectories solvable 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-mass systems) and RLC circuits

Teaching Methodologies

1. Tutorial sheets uploaded in website
2. NPTEL video lectures
3. 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. 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

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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

Course Objectives: The objective of this course is to provide
- Introduce the techniques of tracing a curve using its geometrical properties
- Visualize multivariable functions in the context of function optimization
- Learn the skill of performing integration in 2-D and 3-D and apply them to estimate Characteristics of vector fields
- Introduce the concepts of vector differential calculus
- Demonstrate the Vector Integral Theorem with physical Interpretation.

Course Outcomes: At the end of the course, the student will be able to
- Identify the techniques of curve tracing and geometry to precisely estimate areas and volumes
- Solve problems on function optimization with and without constraints
- Demonstrate the knowledge of multiple integrals in solving problems in vector fields
- classify the concepts of differential calculus with physical Interpretation
- Categorize the verification and evaluation of Vector integral theorems geometrically.
- Explain the real significance of applications of multiple integrals.
- Classify the concepts of application of Integration.

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

Teaching Methodologies

1. Tutorial sheets uploaded in website
2. NPTEL video lectures
3. MATLAB exercises for visualization

Text Books

1. Advanced Engineering Mathematics: R.K.Jain and S.R.K.Iyengar Narosa 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. Higher Engineering Mathematics: B.S.Grewal-Khanna Publications

GOKARAJU RANGARAJU
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ENGLISH

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

Prerequisites: Familiarity with basic language and communication skills.

Courseo bjectives: The objective of this course is to provide the student with
- Identify the importance to acquire Basic Language Skills in English.
- Relate the vocabulary, Grammar and Structures in English.
- Practice to analyze and express their ideas in the new context.
- Demonstrate the learnt public speaking skills in an enthusiastic manner.
- Integrate oral and written communication skills.

Course outcomes: At the end of the course, the student will be able to
- Read and comprehend a wide range of text and know the importance of lifelong learning.
- Improve English language proficiency with an emphasis on LSRW skills.
- Interpret academic subjects with better understanding.
- Express ideas fluently and appropriately in terms of various social and professional areas.
- Revamp English language skills to meet the corporate needs.
- Present themselves in various formal, social and professional situations.
- Improve literary sense through wide range of selections from various genres.

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.Yadava Raju, 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, Aeda Abidi, Ritu Chaudhry, CengageLearning.
5. Communicate or Collapse, Pushp Latha, Sanjay Kumar, PHI Learning Pvt.Ltd.
6. Communication Skills, Sanjay Kumar, Pushp Latha, Oxford Higher Education.
7. AHand Book for Engineers, Dr. P. Eliah, BS Publications

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENGINEERING PHYSICS

Course Code: GR17A1007 L:2 T:1 P:0 C:3

Prerequisites: Fundamentals In Physics and Mathematics

. **Course Objectives:**The objective of this course Is to provide

- Describe the various bonds between the atoms, structures of crystals and their packing factors.
- Identify the behavior of Free electrons through various theories thereby know the classification ofmaterials.
- Discuss the origin of Electrical and Magnetic properties of various materials.
- Interpret the properties of laser light and how it is used for communication in optical fiber networks.
- Explain the latest developments of Nano-technology.

Course Outcomes: At the end of the course, the student will be able to

- Identify and describe various bonds between the atoms and properties of various materials.
- Explain the behavior of free electrons and how they are responsible for exhibition of various properties.
- Classify various magnetic materials and apply knowledge gained in various fields.
- Differentiate different dielectric materials and its utilization.
- Analyze why Laser light is more powerful than normal light and its applications in various fields.
- Demonstrate the applications of optical fibers in communication.
- Extend the knowledge of characterization techniques to know the composition of Nano material.

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..

Teaching Methodologies

1. Power Point Presentation.
2. Assignments uploaded in website.

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

Course Objectives: The objective of this course is to provide
- Basic computer system concepts.
- Design algorithms and draw flowcharts in a language independent manner.
- Concepts of C-programming language such as variables, operators, branching, looping, functions, arrays, pointers, structures and files.
- Convert recursive function to non-recursive function and vice versa
- Manipulate files.
- Examine the functions available in C-library.
- Interpret and debug the given program.

Course Outcomes: At the end of the course, the student will be able to
- Describe the basic computer system concepts.
- Recite algorithm, draw flowchart and write the program for a given scenario.
- Use the concepts of C-programming language and functions available in C-library to develop the programs.
- Experiment recursive and non-recursive functions
- Create and update files.
- Examine the static memory allocation and dynamic memory allocation of variables.
- Find the errors and trace the output of the program.

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, Multidimensional 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.

Teaching Methodologies

1. White board and marker
2. Power point presentations

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

Reference Books

1. Programming in C, Pradip Dey, 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.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

FUNDAMENTALS OF ELECTRONICS ENGINEERING

Course Code: GR17A1019 L:3 T:1 P:0 C:4

Prerequisites
- Fundamentals of Modern Physics
- Fundamentals of Electrical Networks

Course Objectives: The Objective of this course is to provide
- Define the semiconducting device constructing techniques
- Describe the diode forward and reverse bias characteristics
- Generalize the mathematical equations in design of transistor amplifier circuit design
- Analyze the mechanism of flow of current through the p-n junction and relating this phenomena to the characteristics and operation of the diodes, bipolar and uni polar transistors.
- Explain the principles of the regulated power supply, Zener diodes and regulation.
- Compare the concept of biasing techniques in BJT, FET and MOSFET so as to able to analyze advanced electronic circuits.

Course Outcomes: At the end of the course, students will be able to
- Comprehend the fundamentals of construction of the semiconducting materials, fabrication of elements working principles and operation of semiconductors.
- Analyze the concept with the working principles of forward and reverse bias characteristics.
- Know the basic skills in design and analysis of the filters circuits, biasing circuits
- Discriminate the principle, construction and operation BJTs, FETs and MOSFETs
- Interpret the different techniques for FET and MOSFET circuit designs
- Interpolate the performance and analysis-volt amp characteristics of a BJT and FET amplifiers.
- Analyze the small signal low frequency Transistor amplifiers using h-parameters.

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 a 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.

Teaching Methodologies

- Power Point presentations
- Tutorial Sheets
- Assignments
- Lab experiments with Multisim software

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/Prentice Hall, 9th Edition, 2006.

Reference Books

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

Course Objectives: The Objective of this course is to provide the student
- Introduction to general machining skills in the students
- Develop a skill in dignity of labour,precision,safety at work place,team working and development of right attitude
- To provide the students with hands on experience on different trades of engineering like Carpentry, Tinsmithy, Welding and Housewiring
- Production of simple models
- To perform different practical techniques

Course Outcomes: At the end of the course, students will be able to
- Design and model different prototypes in the Carpentry trade such as Cross lap joint, Dove tail joint
- Create various types in the trade of Fitting such as Straight fit, V-fit
- Construct various basic prototypes in the trade of tin smithy such as rectangular tray and open scoop etc.
- Analyze to make in the trade of Tin Smithy such as Rectangular tray and Open Cylinder
- Apply various House Wiring techniques such as Connecting one lamp with one switch,
- Develop various basic house wiring techniques such as two lamps with one switch, Connecting a Fluorescent tube, Series Wiring, Go down wiring
- Demonstrate to develop various basic prototypes in the trade of Welding such as Lap joint, Lap Tee joint, Butt joint and Corner joint

Unit-I
Carpentry Shop – 1:

1.1. Introduction to various types of wood such as Teak, Mango, Sheesham, etc. (Demonstration and their identification).
1.2. 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 chiselling & their practice
1.3. 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
1.4. Safety precautions in carpentry shop.

Unit-II

Fitting Shop – 2:

2.1. Introduction to fitting shop tools, common materials used in fitting shop.

2.2. 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

2.3. Care and maintenance of measuring tools like callipers, steel rule, try square.

Unit-III

House wiring – 3:

3.1 Study, demonstration and identification of common electrical materials such as wires, cables, switches, fuses, PVC Conduits.

3.2 Study of electrical safety measures and demonstration about use of protective devices such as fuses, and relays including earthing.

JobI Identification of phase, neutral and earth of domestic appliances and their connection to two pin/three pin plugs.

JobII 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

JobIV 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:

4.1 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.

4.2 Introduction and demonstration of hand tools used in tin -smithy shop.

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

corrugated sheet, aluminium sheets etc.

corrugated sheet, aluminium 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 Chaoudhary. 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, Dhanpat Rai and Co., New Delhi.
6. Workshop Technology by HS Bawa, Tata McGraw Hill Publishers, New Delhi.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENGINEERING PHYSICS LAB

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

Prerequisites: FundamentalsofPhysicsandMathematics.

Courseobjectives: Theobjectiveofthiscourseistoprovidethestudentwith

- Record and tabulate physical quantities like resistance, capacitance, a.c voltage and frequency by using digital multimeter and CRO.
- Classify the behavior and characteristics of dielectric and magnetic materials for its optimum utilization.
- Apply the theoretical concepts of optical fibers in practical applications.
- Analyze the behavior of semiconductors in various aspects.
- Revise the basic properties of light like interference, diffraction through hands on experience.

Course outcomes: At the end of the course, the student will be able to

- Identify the usage of CRO, digital multi meter to record various physical quantities.
- Distinguish the characteristics and behavior of dielectric materials in a practical manner.
- Calculate losses in optical fiber and interpret them to the optical communication systems.
- Quantify the type of semiconductor and measurement of energy gap in a semiconductor.
- Investigate the properties of light like interference and diffraction through experimentation.
- Examine the behavior of magnetic materials with the help of graph.
- Analyze the characteristics of light emitting diodes for their optimum utilization.

List of Experiments

` 1. Determine the energy gap of a given semiconductor.

2. Calculate the energy loss in a given Ferro magnetic material by plotting B-H curve.
3. Calculate the Numerical Aperture of a given optical fiber.
4. Determine the Dielectric constant and Curie temperature of PZT material.
5. Calculate the Acceptance angle of a given optical fiber.
6. Draw V-I & L-I Characteristics of LASER diode.
7. Determine the bending losses in a given optical fibers.

8. Determine the Air-gap losses in a given optical fibers.
9. Determine the Hall Coefficient in Ge semiconductor by using Hall Experimental setup.
10. Determine the carrier concentration, mobility of charge carrier in Ge semiconductor.
11. Measure Ac voltage and frequency through CRO.
12. Measure Resistance and Capacitance by using digital multimeter.
13. Determination of wave length of a sourse - Diffraction Grating
14. Determination of Rigidity modulus of a given wire - Torsional Pendulum
15. Dispersive power of the material of a prism
16. Determination of wave length of a source using N
17. Draw V-I and L-I characteristics - LED

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPUTER PROGRAMMING LAB

Course Code: GR171027 L:0 T:0 P:2 C:2

Prerequisite: Basicoperations ofcomputerandknowledge of mathematics

CourseObjectives: Theobjectiveofthiscourseistoprovide
- The fundamentals of C programming language and analyze the given problem.
- Interpret, analyze and write the program for a given scenario.
- Exemplify static and dynamic memory allocation.
- Examine the functions available in C-library.
- Write a program in recursive and non-recursive manner
- Manipulate files.
- The concepts of searching and sorting algorithms for solving real time problems.

Course Outcomes: At the end of the course, the Student will be able to
- Use the programming concepts and c-library for writing the programs.
- Analyze and debug the given program.
- Develop an efficient program.
- Differentiate static and dynamic memory allocation.
- Compare the recursive and non-recursive programming approaches
- Create and update files
- Apply searching and sorting techniques for real time scenario.

Task- I

a) 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.

b) Write a C program to find the roots of a quadratic equation using if-else.

c) 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.

Write a C program using switch statement to accomplish the above task.

d) 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-II

a) Write a C program to construct pyramid of numbers.

b) 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.

c) 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- III

a) Write a C program to calculate the following Sum: $Sum=1-x^2/2!+x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$

b) 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.

c) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Task - IV

a) Write a C program to find both the largest and smallest number in a list of integers.

b) Write a C Program to search whether a given number is present in set of integers

c) Write a C Program to sort a given list of integers.

Task - V

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

b) Write a C program to sort the names of 5 students in the alphabetical order.
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.
Ex: Rotations of the string "NEWS" are NEWS EWSN WSNE SNEW

Task - VI

a) Write a C program to perform the following operations:
i) To insert a sub-string in a given main string at a given position.
ii) To delete n Characters from a given position in a given string.

B) Write a C program to determine if the given string is a palindrome or not?

Task - VII

Write a C program that uses functions to perform the following:
i) Transpose of a matrix
ii) Addition of Two Matrices
iii) Multiplication of Two Matrices

Task - VIII

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

i) To find the factorial of a given integer.
ii) To print the Fibonacci sequence
iii) To find the GCD (greatest common divisor) of two given integers.

Task- IX

a) 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.

b) Write a function using pointer parameter that compares two integer arrays to see whether they are identical. The function returns 1 if they are identical, 0 otherwise.

Task -X

Write a C program that uses functions to perform the following operations on two complex numbers

i) Addition
ii) Subtraction
iii) Multiplication
iv) Division
(Note: represent complex number using a structure.)

Task-XI

a) Write a c program which accepts employee details like (outer structure : name, employid, salary and (inner structure : area, street number, houseno)).Display the employee names and id belonging to a particular area.

b) 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 - XII

a) Write a C Program to display the contents of a file.

b) Write a C Program for merging of two files into a single file.

c) Write a C Program to append data into a file.

Task - XIII

a) Write a C program which copies one file to another.

b) 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-XIV

a) Write a C program to develop Tic Tac Toe game

b) 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, Pradip Dey, 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.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

Course Objectives: The objective of this course is to provide the student with
- Introduce improper integrals and specially to Beta and Gamma Functions
- Introduce the idea of domain transformation for easy problem solving
- Learn the skill of decomposing a periodic and non-periodic function in to fundamental Components using Fourier series and Fourier transform
- Introduce PDE and acquire the skill of finding analytical solutions of such equations
- Identify the real time problem and formulate the mathematical model.

Course Outcomes: At the end of the course, the student will be able to
- Calculate definite integral values using Beta and Gamma Functions
- Develop the skill of evaluating Laplace and inverse Laplace transform to solve linear systems under initial and boundary conditions
- Illustrate the concepts of Laplace Transform to find the solutions of physical problems such as Electrical circuits.
- Interpret the Fourier series and Fourier transform in the context of signals and systems.
- Solve difference equations by Z-Transform.
- Formulate Partial differential equations by eliminating arbitrary functions and arbitrary constants.
- Determine the solution of Boundary value problems (PDE) by Fourier Transform Method.

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 transforms method.

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

Teaching Methodologies

1. Tutorial sheets uploaded in website
2. NPTEL video lectures
3. 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. 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

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NUMERICAL METHODS

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

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

Course Objectives: The objective of this course is to provide the student with

- Explain the distinction between analytical and approximate solutions arising in mathematics
- Acquire skills that equip us to approximate a hidden function using data
- Learn methods that provides solutions to problems hitherto unsolvable due to their complex Nature.
- Create ability to model, solve and interpreted the Engg Problem.
- Introduce the various applications of interpolation in Science and Engg.

Course Outcomes: At the end of the course, the student will be able to

- Develop the skill of determining approximate solutions to problems having no analytical Solutions in different contexts
- Solve problems related to cubic spline fitting and approximation of functions using B-splines and least squares
- Develop the skill of finding approximate solutions to problems arising in linear differential Equations
- Identify how the numerical methods play a vital role in many areas in engineering for example Dynamics, elasticity, heat transfer, electromagnetic theory and quantum mechanics.
- Interpret the mathematical results in physical or other terms to see what it practically means and implies.
- Explain the concept of interpolation is useful in predicting future out comes base on the present knowledge.
- Solve the model by selecting and applying a suitable mathematical method.

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: 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

Curve fitting and B-spline approximation: 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..

Teaching Methodologies

1. Tutorial sheets uploaded in website
2. NPTEL video lectures
3. 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.

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BASIC ELECTRICAL ENGINEERING

Course Code: GR17A1018 L:3 T:1 P:0 C:4

Course Objectives: BEE (Basic Electric Engineering) is common to first year branches of UG Engineering(except BT). At the end of the course the student is expected to

- Introduction of the fundamentals of Electrical Engineering.
- Skill of Practical implementation of fundamental theory concepts.
- Solve problems in the fundamentals of electrical engineering.
- Understand the basic principles of general electrical machinery.
- Understand the applications of electrical engineering in real time.
- Visualization of common real time application of Electrical machinery.

Course Outcomes: At the end of the course, the Students will be able to

- Comprehend the basics of Electrical Engineering and practical implementation of Electrical fundamentals.
- Develop numerical solutions to fundamental electrical engineering.
- Make use of basic principles involved in electrical engineering concepts.
- Examine the methods to solve AC circuits.
- Analyse various circuits using network theorems.
- Know the basics of electric machines used in industries.
- Summarize the different applications of commonly used electric machinery.

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 Book

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 – Dhanpat Rai & 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 M.Durbin by Tata McGraw Hill Company.
5. Electrical Engineering Fundamentals by Vincent Deltoro 6.Circuit Theory by Sudhakar and ShyamMohan

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ENGINEERING CHEMISTRY

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

Prerequisites: FundamentalsinEngineeringChemistryTheoryCourse

CourseObjectives: Theobjectiveofthiscourseistoprovide

- Explain the chemistry of water analysis essential for the functioning of certain core industries.
- Demonstrate how the chemistry of batteries and fuel cells provide energy vital for devices.
- Introduce a variety of engineering materials used in modern technology including
- Semiconductors, conducting polymers, liquid crystals, etc., to relate the molecular and crystal structure and properties to their engineering applications.
- Illustrate materials processing methods for industrial production of plastics, rubbers, silicon

Course Outcomes: At the end of the course, the student will be able to

- Analyse water for the industry required specifications.
- Understand the fundamental principles of electrochemistry for energy production and corrosion prevention.
- Know the origin of different types of engineering materials used in modern technology.
- Design new materials for novel applications.
- Develop the skills required for synthesis and analysis of materials.
- Relate the structure of materials to their properties and applications.
- Understand the processing of fossil fuels for the effective utilization of chemical energy
- Know the necessity of sustainable, environmentally-friendly energy sources like solar energy.

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 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.

Teaching Methodologies

1. White Board with marker, OHP & Power Point Presentation
2. Conducting quizzes,
3. Conducting Experiments
4. Assignment uploaded in website.

Text Books

1. A text book of engineering chemistry by PC Jain and Monica Jain, Dhanpat Rai 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 Bharathi kumari and Dr Ch Jyothsna, 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

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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.

Course Objectives: The objective of this course is to provide the student with

- To distinguish and differentiate the importance of engineering drawing.
- The course of study elevates the interpretation level of manuscripts into engineering drawing.
- Distinguish the basic principles and different steps involved in principle of planes of projections.
- By Interpreting the basic principles, can focus on cause to extend and relate the information of objects.
- Visualize the difference views of a given object through Orthographic and isometric projections

Course Outcomes: At the end of the course, the student will be able to

- Demonstrate different types of lines, the use of different types of pencils and drafter to represent
- Illustrate the basic drawing techniques, conic sections, cycloid curves, involutes and engineering
- Explain the basic concept of principle of planes of projections in front view and top view.
- Make use of orthographic projections of points, lines , planes and solids
- Analyze the structure which was hypostatically designed ex: development of surfaces, section of
- Explain the logic to convert pictorial vies to orthographic projections and orthographic projections to
- Evaluate conversions of isometric views to orthographic views helps in inventing new machinery.

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 First and 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.

Teaching Methodology

Power point Presentations, Working models, white board & marker

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 MAgrawal; 2e Mc Graw Hill Education

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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.

Course Objectives: The objective of this course is to provide
- Summarize the basic data structures.
- Articulate the recursive methods.
- Analyse a problem and prioritize the appropriate data structures.
- Implement the applications of various data structures.
- Enumerate the advantages and disadvantages of data structures.
- Express the importance of data modelling and data structures in advanced programming.
- Demonstrate and correlate basic sorting, searching and hashing algorithms.

Course Outcomes: At the end of the course, the Student will be able to
- Inferring various data structures.
- Demonstrate data structures operations like insertion, searching, deletion and traversing.
- Exemplifying and experiment basic data structures.
- Compare and contrast the benefits of dynamic and static data structures implementations
- Demonstrate different methods for traversing trees
- Compare and contrast the various data structures performance.
- Recite data structures concepts in other domains like databases, compiler construction.

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.

Teaching Methodologies

1. White Board
2. Marker
3. LCD Projector
4. OHP Projector

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

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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.

Course Objectives: The objective of this course is to provide
- Introduce the students to a PC, its basic peripherals and to install different software.
- Enhance the ability of the students in effective usage of Internet using web browsers and tools.
- Design professional word documents; excel spread sheets and power point presentation using Microsoft office tools.
- Illustrate the basic knowledge about the networking devices – Routers and Switches
- Develop basic networks using different cables and different networking devices.
- Illustrate the basic knowledge of HTML and to create a static website.
- Illustrate the basic knowledge on DBMS concepts and store the data in database.

Course Outcomes: At the end of the course, the Student will be able to
- Recognize different peripherals and install different system and application softwares.
- Analyze and explore the use of web browsers and related tools for information extraction.
- Create different documents, presentations and spreadsheet applications.
- Recognize different network devices and their usage.
- Recognize and use different cables.
- Design a static webpage.
- Design and develop Database.

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 OpenOffice: 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.

Teaching methodologies

- Power Point presentations.
- Assignments.
- Hands on experiment.

References Books

1. Introduction to Information Technology, ITL Education Solutions Limited, Pearson Education.
2. Introduction to Computers, Peter Norton, 6/e Mc Graw 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 DATABASE 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/Lab5: Designing of static web page and verify it.

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ENGINEERING CHEMISTRY LAB

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

Prerequisites: FundamentalsinEngineeringChemistryLaboratory

CourseObjectives: Theobjectiveofthiscourseistoprovide

- Introduce practical applications of chemistry concepts to engineering problems.
- Know the laboratory practices implemented in a research and industrial chemistry laboratory.
- Explain the water analysis techniques for removing impurities.
- Demonstrate redox chemistry for analysing engineering materials like cement.
- Explain the measurement of physical properties like viscosity and surface tension of lubricants.

Course Outcomes: At the end of the course, the student will be able to

- Perform analysis of water to the required industrial standards.
- Apply the redox and acid-base titrations for analysing materials used in routine usage like cement, coal, acid in lead acid battery, etc.,
- Develop the skills required for assessing the quality of materials used in industries.
- Design novel ways of instrumental methods of analysis.
- Know the correlation between the measured property and the corresponding application.
- Understand scientific method of designing experiment and learn the skill necessary to perform it.
- Know how to innovate to design alternative energy sources utilizing chemistry for sustainable environment for future generations

List Of Experiments

1. Estimation of Total Hardness in sample water by complexometry
2. Estimation of percentage available chlorine in Bleaching Powder.
3. Estimation of Fe^{2+} by permanganometry.
4. Determination of strength of an acid by potentiometric titration method
5. Determination of strength of an acid by using conductometry.
6. Determination of Strength of an acid in Pb-Acid battery by titrimetric method
7. Determination of percentage of Iron in Cement sample by colorimetry..
8. Estimation of Calcium in port land cement.

9. Determination of Viscosity of the given unknown liquid by Oswald's viscometer.
10. Determination of surface tention of the given unknown liquid by stalagmometer.
11. Preparation of Thiokol rubber.
12. Determination of percentage Moisture content in a coal sample.
13. Estimation of ferrous iron by potentiometric titration using dichromate.
14. Preparation of aspirin drug.

Reference Books

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

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BUSINESS COMMUNICATION AND SOFT SKILLS

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

Prerequisites: Familiarity with basic language and communication skills.

Course objectives: The objective of this course is to provide the student with

- Recognize the role and importance of language and communication skills.
- Know the importance and application of phonology.
- Employ the acquired knowledge in classroom with reference to various social and professional spheres.
- Develop the sense of right usage of formal communication.
- Equip with the skills of listening, critical thinking and writing.
- Acquire the ability to work in teams.

Course outcomes: At the completion of this course the student will be able to

- Interpret the role and importance of various forms of communication skills.
- Utilize various media of verbal and non-verbal communication with reference to various professional contexts.
- Enabled to tote professional responsibilities in an analytical manner.
- Accredit the activity of sequencing ideas in an efficacious style.
- Evaluate and use a neutral and correct form of English.
- Formulate behavior in various formal situations.
- Integrate business communication & soft skills to meet the requirement of corporate communication.

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

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

Unit-IV

Debate: 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: 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; Aeda Abidi, 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

Software Used

1. Sky Pronunciation Suite
2. Clarity
3. Mastering English

SYLLABUS
II-Year

GOKARAJU RANGARAJU
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PROBABILITY AND STATISTICS

L:2 T:1 P:0 C:3

Course Code: GR17A2011

Prerequisites: FundamentalsinBasicMathematics.

CourseObjectives: Theobjectiveofthiscourseistoprovide

- State the fundamentals of Probability and Statistics.
- Describe the properties of random variables and distributions.
- Apply the tests of hypothesis.
- Distinguish between explanatory and response variables and analyse multi variable data using correlation and regression.
- Evaluate random processes.

Course Outcomes: At the end of the course, the student will be able to

- Estimate the chance of occurrence of various uncertain events in different random experiments with strong basics of probability.
- Evaluate random processes which occur in engineering applications governed by the Binomial, Poisson, Exponential, Normal and Uniform distributions.
- Apply various sampling techniques.
- Forecast the models using Regression Analysis.
- Estimate the system performance measures in different queueing processes.
- Apply Inferential Statistics to make predictions or judgments about the population from which the sample data is drawn.
- Develop models for Stochastic Processes.

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: 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 limiting distribution.

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

1. Chalk &Talk
2. 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

1. Fundamentals of Mathematical Statistics, S.C. Gupta ,V. K. Kapoor, S. Chand.
2. Probability, Statistics and Queuing Theory with Computer Applications- Arnold O.Allen, Academic press.
3. Introduction to Probability and Statistics, 12th edition, W. Mendenhall, R.J. Beaverand, B.M. Beaver, Thomson. (Indian edition)
4. Probability, Statistics and Queuing Theory, 2nd Edition, Trivedi, John Wiley and Sons.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

Course Code: GR17A2062 L:3 T:1 P:0 C:4

Prerequisites:
- Fundamentals of Mathematical Notations.
- Fundamentals of Sets and Functions.
- Fundamentals of Graphs and Trees.

Course Objectives: The objective of this course is to provide the student with
- Fundamentals of basic computer related concepts for a coherent development to the students for the courses like Computer Organization, Data Structures, Design and Analysis of Algorithms, Computer Graphics and others.
- Comprehending different Properties of Binary Relations on Set theory, Reflexivity, Symmetry, Transitivity, Graphical representation of symmetric relations, transitive relations, Hasse diagram and their applications apart from that they also learn topics like Monoid, Groups, Semi group, Homomorphism and Isomorphism systems.
- Developing skills in understanding and applying basic concepts on Basis of counting, Combinations and Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial and Multinomial theorems, the principles of Inclusion – Exclusion along with their applications.
- Developing an appreciation for the use of Sequential functions and Calculating Coefficient of generating function, Characteristics roots, Solution of homogeneous, Recurrence Relation.
- Designing and Developing DFS, BFS and Spanning Trees, planar Graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers and their applications

Course Outcomes: At the end of the course, the Student will be able to
- Distinguish between statement logic and predicate logic.
- Think logically and mathematically on topics like Basis of counting Combinations & Permutations, with repetitions, constrained repetitions, Binomial Coefficients etc.
- Design and Develop Trees, Graphs and their applications.
- Develop different Properties of Binary Relations subsequent to the course.
- Demonstrate in practical applications the use of basic counting principles of permutation and combinations.
- Demonstrate knowledge on the foundations of many mathematical computer related concepts.

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

1. Board
2. Markers
3. 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

Prerequisites
- Fundamentals of File Systems and Storage Structures

Course Objectives: The objective of this course is to provide
- Depict the basic concepts involved in designing and building a database management system
- Using the Structured Query Language (SQL)
- Understanding the relational model and relational database management system.
- Providing detailed knowledge of Transaction, concurrency and recovery strategies of DBMS
- Normalization techniques for DBMS

Course Outcomes: At the end of the course, the Student will be able to
- Identify the different applications of Databases
- Translate the conceptual ER model to relational model i.e., tables.
- Construct the database schema from relational model.
- Use the database language for e.g. SQL to manipulate the data in the database.
- Validate the database using normalization techniques.
- Compare the different transaction control mechanisms.
- Understand the file organizations and indexing mechanisms.

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

1. Power Point presentations
2. Tutorial Sheets
3. Assignments
4. 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.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

ADVANCED DATA STRUCTURES THROUGH C++

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

Prerequisite
- Computer programming language.(CPDS)

Course Objectives: The Objectives of this course is to provide the student:
- Recognize the disadvantages of POP and advantage of OOP.
- Learn the basic concepts of object oriented programming.
- Apply advanced OOP concepts in implementing Data Structures.
- Understand the various Data Structures used in representing Dictionaries.
- Identify Priority queues advantages over normal queues.
- Learn Balance trees and their operations.
- Analyze the performance of various data structures.

Course Outcomes: At the end of the course, the student will be able to
- Distinguish between procedures and object oriented programming.
- Compare and contrast various data structures and design techniques in terms of their performance.
- Formulate data structure algorithms through C++.
- Illustrate applications of Hash Tables, Trees and Graph Structures.
- Practicing the construction of various data structures using sample data.
- Select and employ various Rotations in balancing trees.
- Apply various Data structure strategies in solving real time problems

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

1. Power Point presentations
2. White Board
3. Tutorial Sheets
4. 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.

GOKARAJU RANGARAJU
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DIGITAL LOGIC DESIGN

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

Prerequisites
- Fundamentals of Mathematics.
- Knowledge of Problem Solving with Algorithms and Flowcharts.

Course Objectives: The Objectives of this course is to provide the student:
- Comprehend different number systems including the binary system and Boolean algebraic principles.
- Create minimal realizations of single and multiple output Boolean functions;
- Design and analyze combinational circuits using medium scale integrated (MSI) components, including arithmetic logic units;
- Demonstrate knowledge of clocking issues within synchronous systems;
- Apply strategies for state minimization, state assignment, for the implementation of synchronous Finite State Machines
- Design of Combinational circuits using Combinational Programmable Logic Devices (CPLDs) like PROM, PAL, and PLA.
- Design and Verification of digital circuits using a Hardware Description Language (HDL).

Course Outcomes: At the end of the course, the student will be able to
- Apply knowledge of fundamental Boolean principles and manipulation to design Logic Circuits.
- Apply various techniques of Boolean function simplification to create minimal expressions.
- Create combinational circuits for a specified behavior with minimal specification.
- Apply state minimization and reduction to synthesize Sequential circuits.
- Realize combinational circuitry using Combinational PLDs
- Synthesize and simulate combinational and sequential circuits using HDL
- Test HDL models of combinational and sequential circuits.

Unit–I

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

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

1. Power Point presentations
2. Tutorial Sheets
3. 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)

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

ADVANCED DATA STRUCTURES THROUGH C++ LAB

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

Prerequisites
- Computer programming language(CPDS)

Course Objectives: The Objectives of this course is to provide the student
- Differentiate structure programming and Object Oriented programming pattern.
- Learn basics in developing Object Oriented programs.
- Learn programming techniques of Object Oriented principles.
- Understand the usage of various concepts of OOPS in real time solutions.
- Identification of appropriate concepts in solving problems.
- Implement advance data structures using OOP techniques.
- Learn to solve complex problems using OOP techniques.

Course Outcomes: At the end of the course, the student will be able to
- Develop programs illustrating various concepts of oops.
- Implement various data structures like priority queues, trees, graphs.
- Illustrate collision resolution strategies of hashing.
- Apply the knowledge of balanced tree concepts programmatically.
- Develop solutions for a range of problems using object oriented programming.
- Enhance analytical & logical skills in problem solving.
- Develop real-time projects using C++

Task-1

Write C++ program to implement the following
a) Constructors and destructors
b) Overloading constructors

Task2

Write C++ program to implement the following variations of Friend Concepts
a) External Function declared as Friend
b) Member Function declared as Friend
c) One Class declared as Friend of another class.

Task-3

Write C++ program to implement the following
a) Function and Operator Overloading
b) 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
a) Single Inheritance
b) Multiple Inheritance
c) Multilevel Inheritance
d) Hybrid Inheritance

Task-6
Write C++ program to implement Runtime Polymorphism.

Task-7
Write C++ program to implement the
a) Merge sort
b) Heap sort

Task-8
Write a C++ program to implement Open addressing collision resolution strategies of Hashing
a) Linear probing
b) Quadratic probing
c) Double Hashing

Task-9
Write a C++ program to perform the following operations:
a) Insert an element into a binary search tree.
b) Delete an element from a binary search tree.
c) Search for a key element in a binary search tree.

Task-10
Write C++ programs to implement Non-Recursive Tree Traversal techniques
a) Preorder
b) Inorder
c) Postorder.

Task-11
Write C++ program to perform the following operations on AVL tree
a) Insert an element
b) Delete an element from AVL tree
c) Search for a key element in an AVL tree

Task-12

Write C++ programs to Implement Graph Traversal Techniques

a) BFS
b) DFS.

Teaching Methodologies

1. Power Point presentation
2. 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.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

DIGITAL ELECTRONICS LAB

Course Code: GR17A2053 L:0 T:0 P:2 C:2

Course Objectives: The Objective of this course is to provide the student
- Introduction to digital fundamental techniques and process in logi design
- Visualization of digital combinational circuits using VHDL
- Skill of seeing the equations and code developments in design of digital logic circuits
- To understand the concept of VHDL fundamentals
- To understand the counters and registers design with VHDL programming

Course Outcomes: At the end of the course, students will be able to
- Comprehend the fundamentals digital theory to enable the process of logical design
- Analyze the concept of design of digital combinational circuits using VHDL programming
- Know the origin of sequential circuits design using VHDL
- Acquaint with binary to grey and parity checker
- Discriminate in digital counters and registers
- Interpret to understand the concepts of adders and multiplexers
- Interpolate to analyze the various digital circuits functionality

LIST OF EXPERIMENTS

1. DESIGNAND SIMULATION OF COMBINATIONAL CIRCUITS USING VHDL

Experiment 1: Realization of Gates
Experiment 2: Half adder, Full adder
Experiment 3: Magnitude comparator
Experiment 4: Decoder
Experiment 5: Multiplexer
Experiment 6: Demultiplexer
Experiment 7: Binary to Grey Code Converter
Experiment 8: Parity Checker

2. DESIGNAND SIMULATION OF SEQUENTIAL CIRCUITS USING VHDL

Experiment 9: D and T Flip-Flops
Experiment 10: Frequency Divider
Experiment 11: Left Shift Register
Experiment 12: Serial to Parallel Shift Register
Experiment 13: Binary Counter
Experiment 14: Asynchronous BCD Up Counter
Experiment 15: Synchronous Down Counter

Note: A minimum of 12 (Twelve) experiments have to be performed and recorded by the candidate to attain eligibility for Practical Examination.

Lab methodologies

- Assignments
- Lab experiments with Xlinix Software

GOKARAJU RANGARAJU
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DATA BASE MANAGEMENT SYSTEMS LAB

Course Code: GR17A2075 L:0 T:0 P:2 C:2

Prerequisites
- Fundamentals of File Systems
- Fundamentals of Storage Structures

Course Objectives: The Objectives of this course is to provide the student
- Design a Database based on given requirements
- Implement a database schema for a given problem domain.
- Populate and query a database using SQL DDL/DML commands.
- Make projects with knowledge of subject provided to them.
- Use Standard Query Language and its various versions
- Apply normalization techniques on given database.
- Design and build applications using 4GL

Course Outcomes: At the end of the course, the student will be able to
- Adapt strong formal foundation in database concepts and technology.
- Adapt standard query language and its various versions.
- Design a database based on given requirements.
- Design and analyze projects with knowledge of relational model and relational database management system.
- Apply procedures, functions and packages on given database.
- Develop cursors, triggers on given database and implement error handling.
- Relate all these to one or more commercial product environments as they relate to the developer tasks.

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

List of experiments
1. Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSECT, Constraints. Example:- Select the roll number and name of the student who secured fourth rank in the class.

3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
5. i)Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)

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

Text Books

1. ORACLE PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Edition.
2. ORACLE DATABASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc-Graw Hill.
3. SQL & PL/SQL for Oracle 10g, Black Book, Dr. P. S. Deshpande.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENVIRONMENTAL SCIENCE

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

Prerequisites: Basicknowledgeonbasicsciencesandnaturalresources
CourseObjectives: TheObjectivesofthiscourseistoprovide

- Critically evaluate information on human/environmental system
- Integrate human ecology and science of environmental problems.
- Articulate issues of social construction of science
- To develop an understanding of systems and cycles on the earth: of how individual organisms
- Live on the earth
- How different organisms live together in complex communication
- The agricultural use of soil and pesticides
- The description of moving water on and in the earth, and its influence on humans
- The effect of human activities on atmospheric pollution and that effect on us.
- Use of fossil fuels and the effect on climate
- Alternate energy sources
- An understanding of human activities that influence the ocean.

Course Outcomes: At the end of the course, the Student will be able to

- Importance of environment, its purpose, design and perspectives
- Environmental issues related to the exploitation of natural resources and development of the mankind
- Role of professionals in protecting the environment from degradation
- The solutions for environmental problems created by local, national and global developmental activities.
- Critically evaluate literature on environmental problems;
- Develop relevant research questions for environmental investigation
- Use methods and tools of environmental research, including statistical analysis, GIS, and other techniques;

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.

Unit-IV

Environmental Problems and Management Policies: Natural Disasters-Types, Causes and Effects, Global warming, climate change-El 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

1. White board and marker
2. OHP and Field visit

Text Books

1. Text Book of Environmental Studies, ErachBarucha. 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. AText Book of Environmental Science. Aravind Kumar. APH Publishing Corporation.
3. Glimpses of Environment. Dr. KVSG. Murali Krishna. Environmental Protection Society

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Code: GR15A2104 L:2 T:1 P:0 C:3

Course Objectives: The Objectives of this course is to provide

- Clear understanding of demand analysis, elasticity of demand and demand forecasting
- Production function and cost analysis necessary to decide the levels of production and cost of production of the products or services
- Different types of markets and competition, different forms of organisation and different methods of pricing
- Capital and capital budgeting
- Fundamentals of accounting and financial analysis.

Course Outcomes: After studying this course the engineering students - the prospective technocrats or techno-managers will be in a position to:

- understand the markets and competition;
- forecast the demand;
- plan the operations and the production;
- choose an appropriate form of organisation;
- know the cost and decide the price of the products and/or services produced, and
- understand the financial statements and make financial analysis.

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

Teaching Methodologies

- Lectures
- Power Point presentations
- Seminars
- Working out problems on black/white boards
- Conducting tutorials
- Giving homework and/or assignments etc.

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPUTER ORGANIZATION

Course Code: GR17A2076 L:3 T:1 P:0 C:4

Prerequisites:KnowledgeofDigitalLogicDesign.

CourseObjectives: TheObjectivesofthiscourseistoprovidethestudent

- Comprehend operational concepts and understand register organization within a basic computer system
- Analyze the basic computer organization and understand the concepts of Micro programmed control
- Understand the design aspects of Central processing unit organization
- Understand various algorithms for arithmetic operations within a computer system
- Study the different ways of communicating with I/O devices and standard I/O interfaces.
- Study the hierarchical memory system including cache memory and virtual memory.
- Design of Multiprocessor systems using various interconnection structures

Course Outcomes: At the end of the course, the student will be able to

- Demonstrate knowledge of register organization of a basic computer system
- Incorporate In-depth understanding of control unit organization and micro programmed control.
- Understand the performance of central processing unit of a basic computer system.
- Apply various algorithms to perform arithmetic operations and propose suitable hardware for them.
- Analyze and emphasize various communication media in the basic computer system
- Develop an ability to analyze and design various memory structures
- Analyze the performance of a Multiprocessor System and various issues associated with its design.

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, BCDAdder.

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

1. Power Point Presentations
2. Tutorial Sheets
3. 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

OPERATING SYSTEMS

Course Code: GR17A2069 L:3 T:1 P:0 C:4

Prerequisites
- Fundamentals of Computer Engineering
- Fundamentals of system software

Course Objectives: The objective of this course is to provide
- Components of operating system and their working.
- Operations performed by operating system as a resource manager.
- Implementation of different memory management techniques.
- Differentiate various operating systems and compare their features.

Course Outcomes: At the end of the course, the Student will be able to
- Describe functions ,structures of operating systems
- Comprehend various process management concepts including scheduling and synchronization.
- Learn the concepts of memory management and I/O systems.
- Solve issues related to file system interface and implementation of disk management.
- Recognize protection and security mechanisms.
- Analyze the sharing of system resources among the users.
- Differentiate various types of operating systems.

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

1. Power Point presentations
2. Tutorial Sheets
3. 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- AConcept based Approach-D. M. Dhamdhere, 2nd Edition, TMH
2. Operating System ADesign Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Course Code: GR17A2070 L:3 T:1 P:0 C:4

Prerequisite: KnowledgeonC,C++

CourseObjectives: Theobjectiveofthiscourseistoprovide

- The concepts and features of object oriented programming.
- Key aspects of java Standard API library such as util, io, applets, swings, GUI based controls.
- Knowledge of Java's exception handling mechanism, multithreading, packages and interfaces.
- Concepts of event handling mechanism
- Skills in internet programming using applets and swings

Course Outcomes: At the end of the course, the Student will be able to

- Differentiate between procedure oriented programming and object oriented programming.
- Apply object oriented programming features and concepts for solving a given problem.
- Use java standard API library to write complex programs.
- Evaluate the quality of program and improve it.
- Perform validations in the internet programming.
- Find the errors and trace the output of the program.
- Develop interactive programs using applets and swings.

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPUTER NETWORKS

Course Code: GR17A2077 L:3 T:1 P:0 C:4

Prerequisites
- IT Workshop

Course Objectives: The Objectives of this course is to provide the student:
- Acquire the fundamental concepts of computer networks.
- Understand the various transmission media and network topologies.
- Learn about various error detection and correction techniques along with protocols related to data link layer
- Familiarize the students about various routing algorithms and problems in data transmission.
- Enable the students to learn about various transport protocols.
- Comprehend application layer protocols.
- Acquire the fundamental concepts of multimedia and Cryptography.

Course Outcomes: At the end of the course, the student will be able to
- Define basic terminology of computer networks.
- Apply various network configurations and transmission media to build a network for an organization.
- Gain knowledge and develop error correction technique for specified problems.
- Compare various routing methods and give solutions for transmission problems.
- Explain various transmission methods.
- Relate different protocols with various applications.
- Demonstrate solutions to various security problems related web applications.

Unit-I

Introduction: Uses of Computer Networks, Network Hardware, Network Software, Reference Models: OSI, TCP/IP, Examples Networks: Arpanet, Internet, ATM.

Physical Layer: Guided Transmission media, Wireless Transmission Media, Communication Satellites. The public Switched Telephone Network, the Mobile Telephone Network

Unit-II

Data link layer: Design issues, framing, error detection and correction, Elementary Data Link Protocol, Sliding Window Protocols. Medium Access sub layer: The Channel Allocation Problem, Multiple Access Protocols, Ethernet, wireless LANS, Bluetooth, Data Link Layer Switching.

Unit-III

Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, QoS, & the Network Layer in the Internet.

Unit-IV

Transport Layer: Transport Services, Elements of Transport Protocols. The Internet Transport Protocols: UDP & TCP.

Unit-V

Application Layer: DNS, Electronic Mail, the World Wide Web, Multi Media, Cryptography.

Teaching methodologies

1. White board
2. Power Point presentations
3. Tutorials
4. Assignments

Text Books

1. Computer Networks — Andrew S Tanenbaum, 4th Edition, Pearson Education/PHI
2. Data Communications and Networking – Behrouz A. Forouzan, Third Edition TMH.

References Books

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education
2. Understanding communications and Networks- 3rd Edition, W.A. Shay, Thomson A

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

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

Prerequisites: Knowledge on C, C++

Course Objectives: The objective of this course is to provide the student with
- Implement various java concepts.
- Write java programs to solve mathematics, science and engineering problems.
- Prediction of compile time and runtime errors.
- Essentials of java class library and user defined packages.
- Skills in internet programming using applets and swings

Course Outcomes: At the end of the course, the Student will be able to
- Write a java program for given problems.
- Identify the advantages of object oriented programming.
- Differentiate compile time and run time errors.
- Use JDK environment to create, debug, compile and run java programs.
- Apply object oriented programming features and concepts for solving given problem.
- Create user defined packages and exceptions.
- Develop interactive programs using applets and swings.

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
a) Constructor
b) Parameterized constructor
c) Method overloading
d) Constructor overloading.

Task-2
a) Write a Java program that checks whether a given string is a palindrome or not.
Ex: MADAM is a palindrome.
b) Write a Java program for sorting a given list of names in ascending order.
c) 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

a) this
b) super
c) static
d) final

Task-4

a) Write a java program to implement method overriding
b) Write a java program to implement dynamic method dispatch.
c) Write a Java program to implement multiple inheritance.
d) Write a java program that uses access specifiers.

Task-5

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

Task-6

a) Write a Java program for handling Checked Exceptions.
b) Write a Java program for handling Unchecked Exceptions.

Task- 7

a) 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.
b) Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

Task-8

a) Develop an applet that displays a simple message.
b) 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

a) Write a Java program for handling mouse events.
b) Write a Java program for handling key events.

Task-11

1. 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 exeption in a message dialog box.

Task -12

a) 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.
b) 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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

OPERATING SYSTEM AND COMPUTER NETWORKS LAB

Course Code: GR17A2078 L:0 T:0 P:2 C:2

Prerequisites
- Fundamentals of computer science
- Fundamentals of data communication

Course objectives: The Objectives of this course is to provide the student:
- Demonstrate the core features of Operating Systems and Networks.
- Evaluate the memory management techniques.
- Understand the file storage and organization concept
- Evaluate the various Algorithms of the Computer Networks and Operating Systems
- Evaluate the various error correction and detection methods
- Demonstrate and compare the various encryption algorithms.
- Simulate the routing algorithms

Course outcomes: At the end of the course, the student will be able to
- Understand and analyze the various file organization techniques
- Interpret and adapt the different operating systems and Networking systems.
- Implement of CPU scheduling algorithms.
- Compare and Contrast page replacement techniques.
- Understand the implementation aspect of data link layer
- Implement various routing algorithms.
- Compare and contrast the various encryption mechanisms.

PART- I

Objectives

To understand the operating System functionalities System/ Software requirement

1. Simulate the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies
   a) Sequential b) Indexed c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques
   a) Single level directory b) Two level directory

5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate all page replacement algorithms
   a) FIFO b) LRU c) LFU
7. Simulate Paging Technique of memory management.

PART-II

1. Implement the data link layer framing methods such as character, character stuffing and bit stuffing.
2. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP.
3. Implement Dijkstra's algorithm to compute the Shortest path through a graph.
4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm. Take an example subnet of hosts. Obtain broadcast tree for it.
5. Using RSAalgorithm Encrypt a text data and Decrypt the same.

Teaching methodologies

1. Power Point presentations
2. Tutorial Sheets
3. Assignments
4. Lab experiments

Text Books

1. Operating System Concepts- Abraham S. Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Operating Systems–Internal and Design Principles Stallings, Fift Edition–2005,Pearson education/PHI
3. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systes Approach", Third Edition, Morgan Kauffmann Publishers Inc., 2003.

Reference Books

1. Operating systems- AConcept based Approach-D. M. Dhamdhere, 2nd Edition, TMH
2. Operating System ADesign Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI.
4. James F. Kuross, Keith W. Ross, "Computer Networking, A Top-Down Approach Featuring the Internet", Third Edition, Addison Wesley, 2004.
5. Andrew S. Tanenbaum, "Computer Networks", Fourth Edition, 2003.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

WEB DESIGNING LAB

Course Code: GR17A2079 L:0 T:0 P:2 C:2

Prerequisites
- Fundamentals of HTML

Course Objectives: The Objectives of this course is to provide the student:
- Design static web pages using HTML.
- Build interactive web applications.
- Build the static pages and validate the applications.
- Design brouchers, editing photos using Adobe Photoshop.
- Design the tweens, shapes and creating the Banners using Flash.
- Design animations and motion of the images using Adobe Flash.
- Design the websites using Dream Viewer.

Course Outcomes: At the end of the course, the student will be able to
- Build a static web sites using HTML.
- Design and implement web services.
- Apply the techniques and knowledge to provide the web interactivity.
- Apply the knowledge to provide security to the applications.
- Apply adobe Photoshop to create brouchers and edit the photos.
- Apply adobe flash to create the animations.
- Design the Web Pages using Dreamweaver tools.

Adobe Photoshop
1. Move, Marque, Lasso, Crop, Image Manipulation Tools
2. Brushes, Patterns, Gradients
3. Pen, Shape, Text Tools
4. Working with Layers, Grouping and Smart Objects
5. Image Adjustments, Layer Masking, Layer Clipping
6. Using Blending Options to create unique effects
7. Filter Effects
8. Animation using Photoshop
9. Brochure Designing
10. Designing a Logo
11. Creating a Business Card
12. Design Banners for Website

HTML 5

1. Designing a Layout using HTML5 tags

Cascading Style Sheets 3.0

1. Create a HTML document using CSS 3.0 properties

Java Script

1. Validation of Forms
2. Slide Show Effects in JS
3. Date / Calendar Integration

Dream weaver

1. Template Design in Dream weaver using various tags
2. Creating a Site for Static Project using various tool bars

Adobe Flash

1. Shape Tween and Motion Tween
2. Frame Animation
3. Creating Flash Banners
4. Creating Flash Intro's
5. Creating Flash Website

Teaching methodologies

1. Power Point presentations
2. Lab experiments

Text Books

1. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
2. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech.

References Books

1. An Introduction to web Design and Programming –Wang-Thomson

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

VALUE EDUCATION AND ETHICS

Course Code: GR17A2002 L:2 T:0 P:0 C:0

Prerequisites: GeneralawarenessonMoralScience

CourseObjectives: Theobjectiveofthiscourseistoprovide

- Define and classify values, ethics
- Explain about self analysis, importance of values
- Organise constructive thinking and team work to create mutual happiness and prosperity
- Elaborate on ethics and professional ethics using case studies.
- Importance of continuous learning, choosing right work and career.

Course Outcomes: At the end of the course, the student will be able to

- Choose the right value system by self analysis and right understanding
- Make use of positive thinking, dignity of labour for building harmony and peace in self, family and society
- Analysing the importance of personality on effective behavior
- Identify and solve ethical dilemmas by finding value based and sustainable solutions in professional life.
- Find sustainable technological solutions for saving environment
- Compile value and ethical systems for continuous happiness and prosperity
- Take part in effective team work bringing out win-win solutions for complex problems

- **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.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

GENDER SENSITIZATION

Course Code: GR17A2106 L:0 T:0 P:3 C:2

Course Objectives

- To develop students sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

Course Outcomes: At the end of the course, the student will be able to

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

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. Just Relationships: Being Together and Equals (Towards a World of Equals: Unit – 12) Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Further Reading: Rosa Parks – The Brave Heart.

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.Additional Reading: Our Bodies, Our Health (Towards a World of Equals: Unit – 13)

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) Fact and Fiction. Unrecognized and Unaccounted work. Further Reading: Wages and Conditions of Work.

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. New Forums for justice. Thinking about Sexual Violence (Towards a World of Equals: Unit – 11) Blaming the Victim – "! Fought for my Life ……" – Further Reading. The Caste Face of Violence.

Unit-V

GENDERS 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) Reclaiming a Past. Writing other Histories. Further Reading. Missing Pages from Telangana History.

Text Books

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

Reference Books

1. 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.
2. 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-works
3. 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

4. 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.
5. 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
6. Stress Shakti Sanghatana. “We Were Making History….’Life Stories of Women in the Telangana People`s Struggle. New Delhi:Kali of Women, 1989.
7. Menon, Nivedita. Seeing Like a Feminist. New Delhi. Zubaan-Penguin Books, 2012.
8. 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.
9. Javeed, Shayam and AnupamManuhaar. “Women and Wage Discrimination in India: A Critical Analysis”. International Journal of Humanilities and Social Science Invention 2, 4(2013).
10. 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.
11. 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/
12. Jeganathan Pradeep, Partha Chatterjee (Ed). “Community, Gender and Violence Subaltern Studies XI”. Permanent Block and Ravi Dayal Publishers, New Delhi, 2000
13. K. Kapadia. The Violence of Development: The Politics of Identity, Gender and Social Inequalities in India. London: Zed Books, 2002.
14. S. Benhabib. Situating the self: Gender, Community, and Postmodernism in Contemporary Ethics, London: Routledge, 1992.
15. Virginia Woolf ARoom of One`s Oxford: Black Swan. 1992.
16. T. Banuri and M. Mahmood, Just Development: Beyond Adjustment with a Human Face