ACADEMIC REGULATIONS
PROGRAM STRUCTURE
and
DETAILED SYLLABUS

Bachelor of Technology

(Computer Science and Engineering)

(Effective for the students admitted from the Academic Year 2015-16)

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(Autonomous)

ACADEMIC REGULATIONS

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

For all Undergraduate Programmes (B. Tech)
GR15 REGULATIONS

Gokaraju Rangaraju Institute of Engineering and Technology - 2015 Regulations (GR15 Regulations) are given hereunder. These regulations govern all the Undergraduate Programmes offered by various departments of Engineering with effect from the students admitted to the programmes from 2015-16 academic year.

Programme Offered: The Undergraduate programme offered by the department is B.Tech, a four-year regular programme in that discipline.

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

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

Programme Pattern:

A student is introduced to "Choice Based Credit System (CBCS)" for which he/she has to register for the courses at the beginning of each semester as per the procedure.

Each Academic year of study is divided into two semesters.

Minimum number of instruction days in each semester is 90.

The total credits for the Programme is 200. Typically each semester has 25 credits.

Grade points, based on percentage of marks awarded for each course will form the basis for calculation of SGPA(Semester Grade Point Average) and CGPA (Cumulative Grade Point Average).

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 21 and 29.

All the registered credits will be considered for the calculation of final CGPA.

All courses are to be registered by a student in a semester as per the procedure at the beginning of the semester. All the courses are broadly classified as

S.no	Code	Area	% of credits in the Programme Min	Max
1	HS	Humanities and Social Sciences	5	10
2	BS	Basic Sciences	15	20
3	ES	Engineering Sciences	15	20
4	PC	Professional subjects – Core	30	40
5	PE	Professional Subjects – Elective	10	15
6	OE	Open Elective	05	10
7	PW	Project Work	10	15
8	MC	Mandatory Course*	02	02

*Credits/ Marks are not counted for grading / Pass percentage

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

A student shall be declared eligible for the award of B.Tech degree, if 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.

A student has to register for all the 200 credits and secure all credits.

A student has to acquire a minimum of 5.00 SGPA in each semester for the award of B. Tech degree.

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.

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

Attendance Requirements

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.

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.

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

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

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.

Paper Setting, Evaluation of Answer Scripts, Marks and Assessment

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.

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	-	100	100
7	Major Project	50	150	200

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 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) Attendance - 5 marks
		70	Semester-end examination	The semester-end examination is for a duration of 3 hours

2	Practical	25	Internal Exams & Continuous Evaluation	1) Lab Internal :10 marks 2) Record : 5 marks 3) Continuous Assessment : 5 marks 4) Attendance : 5 marks
		50	Semester-end examination	The semester-end examination is for a duration of 3 hours.

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

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

Seminar: For the seminar, the student shall collect information on a specialized topic and prepare a technical report and present the same to a Committee consisting of HOD and two senior faculty and the seminar coordinator of the department. The student shall be assessed for his/her understanding of the topic, its application and its relation with various courses studied during the programme of study for100 marks.

Major Project: The project work is evaluated for 200 marks. Out of 200,50 marks shall be for internal evaluation and 150 marks for the external evaluation. The supervisor assesses the student for 25 marks (Attendance – 5 marks, Continuous Assessment – 15 marks, Report – 5 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.

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.

Attendance - 5 marks.

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.

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.

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

Improvement Examinations: A student who failed to secure SGPA of at least 5.00 in a semester can reappear for the external examination of the required courses of the semester for an improvement in SGPA, with the approval from HOD and faculty advisor.

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.

Academic Requirements:

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.

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

A student shall be promoted from I year to II year if and only if he/she secures 25 credits from all the I year regular and supplementary examinations.

A student shall be promoted from II year to III year if and only if he/she secures 45 credits up to and including II year I Semester or 60 credits upto and including II year II Semester from all regular and supplementary examinations, whether or not the candidate takes the examinations.

A student shall be promoted from III year to IV year if and only if he/she secures 75 credits upto and including III year I Semester or 90 credits upto and including III year II Semester from all regular and supplementary examinations, whether or not the candidate takes the examinations.

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>=80 and Marks <= 100
A+ (Excellent)	9	Marks>=70 and Marks < 80
A (Very Good)	8	Marks>=60 and Marks < 70
B+ (Good)	7	Marks>=55 and Marks < 60
B (Above Average)	6	Marks>=50 and Marks < 55
C (Average)	5	Marks>=45 and Marks < 50
P (Pass)	4	Marks>=40 andMarks < 45
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.,

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

Where C_i is the number of credits of the i 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.

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

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

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

Award of Class: After a student satisfies all the requirements prescribed for the completion of the Degree and becomes eligible for the award of B. Tech Degree by JNTUH, he/she shall be placed in one of the following four classes (the marks awarded are from the aggregate marks secured for the 200 credits):

	Class Awarded	CGPA Secured
13.1	First Class With Distinction	CGPA ≥ 8.00 with no F or below grade/ detention anytime during the programme
13.2	First Class	CGPA ≥ 8.00 with rest of the clauses of 13.1 not satisfied
13.3	First Class	CGPA ≥ 6.50and CGPA < 8.00
13.4	Second Class	CGPA ≥ 5.50 and CGPA < 6.50
13.5	Pass Class	CGPA ≥ 5.00 and CGPA < 5.50

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.

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.

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.

General Rules

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

In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.

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

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 GR15

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

Pursued programme of study for not less than three academic years and not more than six academic years.

Registered for 150 credits and secured 150 credits. The marks obtained in all 150 credits shall be considered for the calculation of the final CGPA.

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.

Academic Requirements

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.

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

A student shall be promoted from II year to III year if and only if he/she secures 25 credits up to and including II year II Semester from all regular and supplementary examinations, whether or not the candidate takes the examinations.

A student shall be promoted from III year to IV year if and only if he/she secures 45 credits up to and including III year I Semester or 60 credits up to and including III year II Semester from all regular and supplementary examinations, whether or not the candidate takes the examinations.

Award of Class: After a student satisfies all the requirements prescribed for the completion of the Degree and becomes eligible for the award of B. Tech Degree by JNTUH, he/she shall be placed in one of the following four classes (the marks awarded are from the aggregate marks secured for the 150 credits):

	Class Awarded	CGPA Secured
3.1	First Class With Distinction	CGPA ≥ 8 with no F or below grade/ detention anytime during the programme
3.2	First Class	CGPA ≥ 8 with rest of the clauses of 3.1 not satisfied
3.3	First Class	CGPA ≥ 6.50 and CGPA < 8
3.4	Second Class	CGPA ≥ 5.50 and CGPA < 6.50
3.5	Pass Class	CGPA ≥5.00 and CGPA < 5.50

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech (CSE) PROGRAMME STRUCTURE

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

Group	Sub-Code	Subject	L	T	P	Credits	Hours	Int.	Ext.	Marks
BS	GR15A1001	Linear Algebra and Single Variable Calculus	2	1	-	3	4	30	70	100
BS	GR15A1002	Advanced Calculus	2	1	-	3	4	30	70	100
HS	GR15A1005	English	2	1	-	3	4	30	70	100
BS	GR15A1007	Engineering Physics	2	1	-	3	4	30	70	100
ES	GR15A1009	Computer Programming	2	1	-	3	4	30	70	100
ES	GR15A1019	Fundamentals of Electronics Engineering	3	1	-	4	5	30	70	100
ES	GR15A1025	Engineering Workshop	-	-	2	2	4	25	50	75
ES	GR15A1027	Computer Programming Lab	-	-	2	2	4	25	50	75
BS	GR15A1029	Engineering Physics Lab	-	-	2	2	4	25	50	75
		Total	**13**	**6**	**6**	**25**	**37**	**255**	**570**	**825**

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

Group	Sub-Code	Subject	L	T	P	Credits	Hours	Int.	Ext.	Marks
BS	GR15A1003	Transform Calculus and Fourier Series	2	1	-	3	4	30	70	100
BS	GR15A1004	Numerical Methods	2	1	-	3	4	30	70	100
ES	GR15A1018	Basic Electrical Engineering	3	1	-	4	5	30	70	100
BS	GR15A1008	Engineering Chemistry	2	1	-	3	4	30	70	100
ES	GR15A1023	Engineering Graphics	1	-	2	3	5	30	70	100
ES	GR15A1010	Data Structures	2	1	-	3	4	30	70	100
ES	GR15A1026	IT Workshop	-	-	2	2	4	25	50	75
BS	GR15A1030	Engineering Chemistry lab	-	-	2	2	4	25	50	75
HS	GR15A1024	Business Communication and Soft Skills	-	-	2	2	4	25	50	75
		Total	**12**	**5**	**8**	**25**	**38**	**255**	**570**	**825**

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

Group	Sub-Code	Subject	L	T	P	Credits	Hours	Int.	Ext.	Marks
BS	GR15A2011	Probability and Statistics	2	1	-	3	4	30	70	100
PC	GR15A2062	Mathematical Foundation of Computer Science	3	1	-	4	5	30	70	100
PC	GR15A2063	Database Management Systems	3	1	-	4	5	30	70	100
PC.	GR15A2064	Advanced Data structures through C++	3	1	-	4	5	30	70	100
PC	GR15A2065	Digital Logic Design	3	1	-	4	5	30	70	100
PC	GR15A2066	Advanced Data structures Through C++ Lab	-	-	2	2	4	25	50	75
PC	GR15A2067	Databases Lab	-	-	2	2	4	25	50	75
PC	GR15A2068	Digital Logic Design Lab	-	-	2	2	4	25	50	75
		Total	**14**	**5**	**6**	**25**	**36**	**225**	**500**	**725**
MC	GR15A2001	Environmental Science	-	-	2	2	4	30	70	100

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

Group	Sub-Code	Subject	L	T	P	Credits	Hours	Int.	Ext.	Marks
HS	GR15A2104	Managerial Economics and Financial Analysis	2	1	-	3	4	30	70	100
PC	GR15A2069	Operating Systems	3	1	-	4	5	30	70	100
PC	GR15A2070	Object Oriented Programming through Java	3	1	-	4	5	30	70	100
PC	GR15A2071	Formal Languages and Automata Theory	3	1	-	4	5	30	70	100
PC	GR15A2076	Computer Organization	3	1	-	4	5	30	70	100
PC	GR15A2072	Object Oriented Programming through Java Lab	-	-	2	2	4	25	50	75
PC	GR15A2073	Operating Systems Lab	-	-	2	2	4	25	50	75
PC	GR15A2074	Advanced Databases Lab	-	-	2	2	4	25	50	75
		Total	**14**	**5**	**6**	**25**	**36**	**225**	**500**	**725**
MC	GR15A2002	Value Education and Ethics	-	-	2	2	4	30	70	100
MC	GR15A2106	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: GR15A1001 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

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,Consistency of a system of linear equations-Pseudo inverse of a matrix-Condition number of a matrix-Approximate solution of an over determined system of linear equations using the pseudo inverse-Solution of a system of homogeneous linear equations.

Vector norms, Linear dependence of vectors, Gram-Schmidt orthogonalization of vectors, Matrix norms. 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- Computation of 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 Lagrange's method and 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) - Approximation of functions by Taylor's and Maclaurin's theorems-Series expansion of functions.

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.

Unit-V

Linear differential equations of the higher order and applications: Equations with constant coefficients-Particular integrals for functions of the type e^{ax}, x^n, sinax, cos ax, $e^{ax}.V(x)$ Exponential shift - Method of variation of parameters.
Applications - Deflection of beams, Simple harmonic motion (simple pendulum, spring-mass systems) and RLC circuits.

Teaching Methodologies

Tutorial sheets uploaded in website

NPTEL video lectures

MATLAB exercises for visualization

Text Books

Advanced Engineering Mathematics: R.K.Jain and S.R.K.Iyengar- Narosa Publishing House

Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.

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

References Books

Introduction to Linear Algebra-Gilbert Strang

Schaum's outline series on Linear Algebra

GRIET reference manual

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INSTITUTE OF ENGINEERING AND TECHNOLOGY

ADVANCED CALCULUS

Course Code: GR15A1002 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 - Hessian matrix-Total differentiation-Jacobians. Optimization of functions of several variables without constraints- Constrained optimization of functions of several variables with equality constraints-The Lagrange's multiplier method.

Unit-II

Curve tracing principles and Applications of integration: Preliminary treatment of curve tracing Cartesian, polar and parametric curves -Applications of the definite integral to evaluate arc lengths, surface areas and volumes generated by revolution of plane area.

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

Unit-IV

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

Unit-V

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

Teaching Methodologies

Tutorial sheets uploaded in website

NPTEL video lectures

MATLAB exercises for visualization

Text Books

Advanced Engineering Mathematics: R.K.Jain and S.R.K.Iyengar Narosa Publishing House

Schaum's outline series on Vector Analysis

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

Reference Books

Advanced Engineering Mathematics: Erwin Kreyszig-Wiley

Calculus and Analytical Geometry-Thomas & Finney-Narosa

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

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENGLISH

Course Code: GR15A1005 L:2 T:1 P:0 C:3

Prerequisites: Familiarity with basic language and communication skills.

Course objectives: The objective of this course is to provide

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

1. Chapter entitled Sir C.V. Raman: A Path breaker in the saga of Indian Science from "Enjoying Every day English", Published by Sangam Books, Hyderabad.
   Chapter Entitled Mother Teresa from "Inspiring Speeches and Lives", Published by Maruthi Publications, Guntur
   Tutorial-1: Present a small biographical sketch of an inspiring personality **Tutorial-2:** Prepare an essay on "Charity begins at home."

Unit-II

Grammar & Vocabulary Development: Articles: Types of Articles and their usages; Tense and Aspect; Subject and Verb Agreement; Prepositions
Vocabulary Development: Synonyms and Antonyms; One-word substitutes; prefixes and suffixes; words often confused; idioms and phrases.
Speaking & Writing skills: Information transfer: verbal to graphical presentation and from graphical presentation to verbal. Public Speaking: Body Language, Presentation Skills and its Features.

Tutorial-3: Worksheet on the usage of Tenses, Articles and Prepositions

Tutorial-4: Exercises on vocabulary

Tutorial-5: Interpretation of data from different formats

Unit-III

Chapter Entitled The Connoisseur from "Enjoying Every day English", Published by Sangam Books, Hyderabad

Chapter Entitled Sam Pitroda from "Inspiring Speeches and Lives", Published by Maruthi Publications, Guntur.

Tutorial-5: Story Analysis

Tutorial-6: Present a person who bears risk taking ability to solve the problems of people/society

Tutorial-7: Describe a strange event that occurred in your life

Unit-IV

Chapter Entitled Bubbling Well Road from "Enjoying Every day English", Published by Sangam Books, Hyderabad

Chapter Entitled Amartya Kumar Sen from "Inspiring Speeches and Lives", Published by Maruthi Publications, Guntur

Tutorial-9: Oral Presentation on "Does the quality of Unity in Diversity helped us to acquaint easily with the trends of globalization?"

Tutorial-10: Develop an essay "The ways to impart moral and ethical values amongst the students."

Unit-V

Chapter entitled The Cuddalore Experience from "Enjoying Every day English", Published by Sangam Books, Hyderabad

Chapter Entitled Martin Luther King Jr. (I have a dream) from "Inspiring Speeches and Lives", Published by Maruthi Publications, Guntur

Tutorial-11: Presentation on "The possible ways to educate students about Disaster Management."

Tutorial-12: Write or present "Is every present leader was a follower?"

Text Books

Enjoying Every day English by A. Rama Krishna Rao- Sangam Books

Inspiring Speeches and Lives by Dr.B.Yadava Raju, Dr.C.Muralikrishna, Maruthi Publications.

Reference Books

Murphy's English Grammar with CD, Murphy, Cambridge University Press.

Effective Technical Communication, M. Ashraf Rizvi, Tata McGraw Hill.

Technical Communication, Meenakshi Raman, Sangeeta Sharma, Oxford higher Education.

English for Engineers Made Easy, Aeda Abidi, Ritu Chaudhry, CengageLearning.

Communicate or Collapse, Pushp Latha, Sanjay Kumar, PHI Learning Pvt.Ltd.

Communication Skills, Sanjay Kumar, Pushp Latha, Oxford Higher Education.

A Hand Book for Engineers, Dr. P. Eliah, BS Publications

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENGINEERING PHYSICS

Course Code: GR15A1007 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 of materials.
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, Bravias lattice, unit cell and lattice parameters, Seven Crystal Systems with 14 Bravias lattices , Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC, Miller Indices, Inter planar 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.

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 -Mosotti Equation, Piezo-electricity and Ferro- electricity.

Magnetic Properties: Magnetic Permeability, Magnetic Field Intensity, Magnetic Field Induction, Intensity of Magnetization, Magnetic Susceptibility, 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, Ferrites and their Applications.

Unit-IV

Lasers: Characteristics of Lasers, Spontaneous and Stimulated Emission of Radiation, Meta-stable State, Population Inversion, 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), Attenuation in Optical Fibers, Applications 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; Top-down Fabrication: Chemical Vapor Deposition, Physical, Chemical and Optical properties of Nano materials, Characterization (SEM, EDAX), Applications.

Teaching Methodologies

Power Point Presentation.

Assignments uploaded in website.

Text Books

Engineering Physics: P.K.Palanisamy, Scitech Publishers.

Engineering Physics: S.O.Pillai, New age International.

Applied Physics: T.Bhima Sankaram,G Prasad,BS Publications

Reference Books

Solid State Physics: Charles Kittel, Wiley & Sons (Asia) Pte Ltd.

Fundamentals of physics: Halliday, Resnick, Walker.

Optical Electronics: A.J Ghatak and K.Thyagarajan, Cambridge University Press.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPUTER PROGRAMMING

Course Code: GR15A1009 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

White board and marker
Power point presentations

Text Books

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

Reference Books

Programming in C, Pradip Dey, Manas Ghosh, Second Edition, Oxford University Press.
Let Us C, Yashwanth Kanetkar, 10th Edition, BPB Publications.
C& Data structures, P.Padmanabham, B.S. Publications.
Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
Programming with problem solving, J.A.Jones & K.Harrow, Dreamtech Press.
Programming in C, Stephen G.Kochan, III Edition, Pearson Education.
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 AND ENGINEERING

Course Code: GR15A1019 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

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

Reference Books

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: GR15A1025 L:0 T:0 P:2 C:2 I Year I Semester

Prerequisites

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

Course Objectives: The Objective of this course is to provide

- 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:

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

Unit-II

Fitting Shop – 2:

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

Description and demonstration of simple operation of hack-sawing, demonstration and description of various types of blades and their specifications, uses and method of fitting the blade.

Job I Marking of job, use of marking tools and measuring instruments.

Job II Filing a dimensioned rectangular or square piece of an accuracy of + 0.5 mm

Job III Filing practice (production of flat surfaces). Checking by straight edge.

Job IV Making a cutout from a square piece of MS Flat using hand hacksaw such as T-fit and V-fit

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

Unit-III

House wiring – 3:

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

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

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:

Introduction to tin -smithy shop, use of hand tools and accessories e.g. different types of hammers, hard and soft mallet, sheet and wire gauge, necessary allowance required during job fabrication, selection of material and specifications.

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

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

Workshop Technology I,II,III, by S K Hajra, Choudhary and A K Chaoudhary. Media Promoters and Publishers Pvt. Ltd., Bombay

Workshop Technology by Manchanda Vol. I,II,III India Publishing House, Jalandhar.

Manual on Workshop Practice by K Venkata Reddy, KL Narayana et. al; MacMillan India Ltd.

Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd.,New Delhi

Workshop Technology by B.S. Raghuwanshi, Dhanpat Rai and Co., New Delhi.

Workshop Technology by HS Bawa, Tata McGraw Hill Publishers, New Delhi.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENGINEERING PHYSICS LAB

Course Code: GR15A1029 L:0 T:0 P:2 C:2

Prerequisites: Fundamentals of Physics and Mathematics.

Course objectives: The objective of this course is to provide

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.

Calculate the energy loss in a given Ferro magnetic material by plotting

B-H curve.

Calculate the Numerical Aperture of a given optical fiber.

Determine the Dielectric constant and Curie temperature of PZT material.

Calculate the Acceptance angle of a given optical fiber.

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

Determine the bending losses in a given optical fibers.

Determine the Air-gap losses in a given optical fibers.

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

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

Measure Ac voltage and frequency through CRO.

Measure Resistance and Capacitance by using digital multimeter.

Diffraction Grating.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPUTER PROGRAMMING LAB

Course Code: GR15A1027 L:0 T:0 P:2 C:2

Prerequisite: Basic operations of computer and knowledge of mathematics

Course Objectives: The objective of this course is to provide

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

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.

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

The program should request the user to input two numbers and display one of the following as per the desire of user.

Sum of numbers

Difference of numbers

Product of the numbers

Division of the numbers.

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

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

Write a C program to construct pyramid of numbers.

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.

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

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

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.

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

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

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

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

Task - V

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

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:

To insert a sub-string in a given main string at a given position.

To delete n Characters from a given position in a given string.

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:

Transpose of a matrix

Addition of Two Matrices

Multiplication of Two Matrices

Task - VIII

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

To find the factorial of a given integer.

To print the Fibonacci sequence

iii)To find the GCD (greatest common divisor) of two given integers.

Task- IX

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.

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

Addition

Subtraction

Multiplication

Division

(Note: represent complex number using a structure.)

Task-XI

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.

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

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

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

Write a C Program to append data into a file.

Task - XIII

Write a C program which copies one file to another.

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

Write a C program to develop Tic Tac Toe game

Write a C program to solve Towers of Hanoi

Text Books

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

Reference Books

Programming in C, Pradip Dey, Manas Ghosh, Second Edition, Oxford University Press.
Let Us C, Yashwanth Kanetkar, 10th Edition, BPB Publications.
C& Data structures, P.Padmanabham, B.S. Publications.
Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
Programming with problem solving, J.A.Jones & K.Harrow, Dreamtech Press.
Programming in C, Stephen G.Kochan, III Edition, Pearson Education.
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: GR15A1003 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

- 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.

Unit-II

Laplace Transform: 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.

Unit-III

Z-Transform and Fourier series: Definition-Z transform of elementary sequences-Properties-The inverse Z Transform, Application of Z transform to solve difference equations Definition of orthogonal functions-The concept of Weight function-Fourier series of periodic functions-Fourier expansion of periodic functions-Half range Fourier series expansions.

Unit-IV

Fourier Transform: Exponential Fourier series-The continuous one dimensional Fourier transform-Properties-Convolution-Parseval's identity- Fourier Sine and Cosine transforms.

Unit-V

Partial differential equations: Formation of PDE-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

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

Text Books

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

Reference Books

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

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

NUMERICAL METHODS

Course Code: GR15A1004 L:2 T:1 P:0 C:3 I Year II Semester

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

Course Objectives: The objective of this course is to provide

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-Regula Falsi- Fixed point iteration method-Newton Raphson method - Rate of convergence of the above methods (without proof). LU decomposition method-Cholesky's method-Jacobi and Gauss Seidel iteration methods- Convergence of iterative methods (without proof).

Unit-II

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

Unit-III

Curve fitting and B-spline approximation: Method of least squares- Fitting a straight line, and second degree parabola, exponential and power curves to data-Approximation of functions by B-Splines (Linear and Quadratic cases only).

Unit-IV

Numerical differentiation and numerical integration: Numerical differentiation using the Newton's forward, backward and central difference formulas-Numerical integration by Trapezoidal rule, Simpson's 1/3rd and 3/8th rules-Gauss-Legendre one point, two point and three point rules.

Unit-V

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

Teaching Methodologies

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

Text Books

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

Reference Books

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

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

BASIC ELECTRICAL ENGINEERING

Course Code: GR15A1018 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

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

Reference Books

Circuit Theory (Analysis and Synthesis) by A.Chakrabarti – Dhanpat Rai & Co
Basic Electrical Engineering by Nagasarkar, Oxford Publishers
Network Theory by Prof.B.N.Yoganarasimham.
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

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENGINEERING CHEMISTRY

Course Code: GR15A1008 L:2 T:1 P:0 C:3

Prerequisites: Fundamentals in Engineering Chemistry Theory Course

Course Objectives: The objective of this course is to provide

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 process. Alkalinity of water and its determination, Potable water- its characteristics and steps involved in Municipal Water Treatment, Chlorination-Break Point Chlorination, sterilization by ozonation. Desalination of Brackish water - Reverse Osmosis. Waste water-types of effluents, domestic and industrial effluents(an overview)

Unit-II

Electrochemistry & Corrosion: Concept of Conductances-specific, equivalent, molar conductances and their inter relationships applications of conductance-conductometric titrations-(Strong acid Vs Strong Base and Weak Acid Vs Strong Base). EMF of a cell, Electrode- Single Electrode Potential, Standard Electrode potential, Electro chemical series and its applications, Electrochemical Cells-types, Galvanic cell: cell representation, Cell reactions, Cell EMF, Electrolytic cells, Concentration cell. Batteries-types Lithium Cell(Li-thionyl Chloride), Secondary cells: Pb-PbO_2 cell, Fuel cells: H_2-O_2 fuel cells and their applications.

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(Galvanisation), Cementation(Sheradising), Electroplating(Cu coating), Organic Coatings: Paints – its constituents and their functions.

Unit-III

Engineering Materials I: Cement-types-portland cement –composition, Setting & Hardening of Portland cement. Ceramics-types-ceramic products - whitewares, Stonewares, properties and applications of ceramics. Refractories-classification,properties(refractoriness,RUL,thermal spalling, thermal conductivity) and their application.

Lubricants: Classification with examples, mechanisms of lubrication (thick film, thin film, extreme pressure), properties of lubricants- viscosity, flash point, fire point, cloud point, pour point (Definition and significance).

Unit-IV

Engineering Materials II: Electronic materials : 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 Hi Density Poly Ethylene(HDPE), Poly Vinyl Chloride(PVC), Bakelite & Nylon 6,6. Liquid Crystal Polymers and their applications, Organic Light Emmiting Diodes (an Overview). Biodegradable polymers-their advantages and their applications. Elastomers – preparation, properties and applications of Butyl rubber, Thiokol 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: 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, Theoretical calculation of Calorific Value by Dulong's formula, Numerical Problems. Petroleum-its composition-synthetic petrol – Bergius and Fischer Tropsch's process method , cracking (Definition) and its 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 transesterification method, advantages of Bio-fuel.

Teaching Methodologies

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

Text Books

A text book of engineering chemistry by PC Jain and Monica Jain, Dhanpat Rai publishing company.

Reference Books

A text book of engineering chemistry by SS Dara and SS Umre, S Chand publications.
A text book of engineering chemistry by Dr Y Bharathi kumari and Dr Ch Jyothsna, VGS publications.
A text book of engineering chemistry by R.P.Mani, K.N.Mishra, B.Rama Devi, V.R.Reddy, cengage learning publications

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENGINEERING GRAPHICS

Course Code: GR15A1023 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

Engineering Drawing, N.D. Bhat / Charotar

Reference Books

Engineering Drawing and Graphics, Venugopal / New age.

Engineering Drawing- Johle/Tata Macgraw Hill.

Engineering Drawing, Narayana and Kannaiah / Scietech publishers. Engineering Drawing, Narayana and Kannaiah / Scietech publishers.

Engineering Drawing Basanth Agrawal/ C M Agrawal; 2e Mc Graw Hill Education

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

DATA STRUCTURES

Course Code: GR15A1010 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

White Board

Marker

LCD Projector

OHP Projector

Text Books

Data Structures, 2/e, Richard F, Gilberg, Forouzan, Cengage

Data Structures and Algorithms, 2008,G.A.V.Pai, TMH

Reference Books

Data Structure with C, Seymour Lipschutz, TMH

Classic Data Structures, 2/e, Debasis, Samanta, PHI, 2009

Fundamentals of Data Structure in C, 2/e, Horowitz, Sahni, Anderson Freed, University Press

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

IT WORKSHOP

Course Code: GR15A1026 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

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

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENGINEERING CHEMISTRY LAB

Course Code: GR15A1030 L:0 T:0 P:2 C:2

Prerequisites: Fundamentals in Engineering Chemistry Laboratory

Course Objectives: The objective of this course is to provide

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

Estimation of Total Hardness in sample water by complexometry

Estimation of percentage available chlorine in Bleaching Powder.

Estimation of Fe^{2+} by permanganometry.

Determination of strength of an acid by potentiometric titration method

Determination of strength of an acid by using conductometry.

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

Determination of percentage of Iron in Cement sample by colorimetry..

Estimation of Calcium in port land cement.

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

Determination of surface tention of the given unknown liquid by stalagmometer.

Preparation of Thiokol rubber.

Determination of percentage Moisture content in a coal sample.

Reference Books

Laboratory Manual on Engineering Chemistry, by Dr Sudha Rani, Dhanpat Rai Publishing house.

A Text 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.

Engineering Chemistry practical manual prepared by faculty of engineering chemistry, GRIET(A) - (for college circulation only)

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

BUSINESS COMMUNICATION AND SOFT SKILLS

Course Code: GR15A1024 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 ananalytical 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): Introduction to public speaking, analyzing and assimilating ideas, audience, voice modulation, Pronunciation and enunciation.

Unit-II

Phonetics: Introduction to speech sounds; identification of sound symbols; vowel and consonants

Unit-III

Roleplay: Introduction to role play; 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

Unit-V

Describing a Person, Situation, Process and Object: Introduction to techniques of clear, brief and impersonal description to a listener or reader.

Unit-VI

Letter Writing: Manual and Emailing, types and formats, content and body of the letter. Email etiquette.

Unit-VII

Report Writing: Formats and types 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

Business Communication; Hory Sankar Mukerjee; Oxford University Press

Business Communication; Meenakshi Raman, Prakash Singh; Oxford University Press

English and Soft skills; SP DHanavel; Orient Blackswan

Soft Skills for Everyone; Jeff Butterfield; Cengage Learning

Communication Skills; Viva Career Skills Library

Personality Development and Soft Skills; Barun K Mitra; Oxford University Press

Six Thinking Hats, Penguin Books, Edward De Bono

English for Engineer's; Aeda Abidi, Ritu Chaudhry; Cengage Learning

Communication Skills ; Sanjay Kumar , Pushpalatha; Oxford University Press

Business English : The Writing Skills you need for today's work place: Geffner, Andrea: Fifth edition, Barron's Educational Series, Newyork

Software Used

Sky Pronunciation Suite

Clarity

Mastering English

SYLLABUS

II-Year

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

PROBABILITY AND STATISTICS

Course Code: GR15A2011 L:2 T:1 P:0 C:3

Prerequisites: Fundamentals in Basic Mathematics.

Course Objectives: The objective of this course is to provide

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.

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 - Mathematical expectation and variance of a random variable with examples and statements of their properties.

Unit-II

Distributions: Binomial, Poisson, Uniform, Normal and Exponential distributions (Definition, Real life examples, Statements of their Mean, Mode and Variance and Problems). Fitting of Binomial 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: 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, independence of attributes and single population variance.

Unit-IV

Small samples: Student's t-test for testing the significance of single mean, difference of means(independent samples and paired samples), F-test for equality of variances (Concepts and problem solving) .

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 and stochastic matrices. Definitions of a Markov chain, transition probability matrix, initial probability distribution, joint distribution and n-step TPM. 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

Chalk &Talk
Ppts

Text Books

Probability and statistics for engineers (Erwin Miller and John E. Freund), R.A Johnson and C. B. Gupta, Pearson education.

Fundamentals of Stochastic process-Medhi (for Unit-V), New age international publications.

Probability and Statistics, Dr. T. K. V. Iyengar, Dr. B. Krishna Gandhi et.al, S. Chand.

Reference Books

Fundamentals of Mathematical Statistics, S.C. Gupta ,V. K. Kapoor, S. Chand.

Probability, Statistics and Queuing Theory with Computer Applications-Arnold O.Allen, Academic press.

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

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: GR15A2062 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

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

Board

Markers

LCD Projector

Text Books

Discrete and Combinational Mathematics- An Applied Introduction-5th Edition – Ralph. P.Grimaldi, Pearson Education

Discrete Mathematical Structures with applications to computer science Trembly J.P. & Manohar .P, TMH

Mathematical Foundations for Computer Science Engineers, Jayant Ganguly, Pearson Education

Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition.TMH.

Reference Books

Discrete Mathematics with Applications, Thomas Koshy, Elsevier

Discrete Mathematical Structures, Bernand Kolman, Roberty C. Busby, Sharn Cutter Ross, Pearson Education/PHI.

Discrete Mathematical structures Theory and application-Malik & Sen

Discrete Mathematics for Computer science, Garry Haggard and others, thomson.

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: GR15A2063 L:3 T:1 P:0 C:4 II Year I Semester

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

Power Point presentations
Tutorial Sheets
Assignments
Lab experiments with Oracle Software

Text Books

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

Reference Books

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

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ADVANCED DATA STRUCTURES THROUGH C++

Course Code: GR15A2064 L:3 T:1 P:0 C:4

Prerequisite

Computer programming language.(CPDS)

Course Objectives: The Objectives of this course is to provide

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

Power Point presentations
White Board
Tutorial Sheets
Assignments

Text Books

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

"Object Oriented Programming with C++", E Balagurusamy, Mcgraw Hill Higher Education, Second edition

Reference Books

"Object Oriented Programming with C++", Subhash K U, Pearson

"Data structures and Algorithms in C++", Michael T.Goodrich, R.Tamassia and D.Mount, Seventh Edition Wiley student edition, John Wiley and Sons.

"Data Structures and Algorithms in C++", Third Edition, Adam Drozdek, Thomson

C++, The Complete Reference, 4th Edition, Herbert Schildt, TMH.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

DIGITAL LOGIC DESIGN

Course Code: GR15A2065 L:3 T:1 P:0 C:4 II Year I Semester

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

Power Point presentations
Tutorial Sheets
Assignments

Text Books

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

References Books

Switching and Finite Automata Theory by ZviKohavi, Tata McGraw Hill.
Fundamentals of Digital Logic with VHDL Design, Stephen Brown, Zvonko Vranesic, Tata McGraw Hill, Indian edition.
Switching and Logic Design – CVS Rao, Pearson Education
Digital Principles and Design – Donald D.Givone, Tata McGraw Hill.
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: GR15A2066 L:0 T:0 P:2 C:2

Prerequisites

Computer programming language(CPDS)

Course Objectives: The Objectives of this course is to provide

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
Constructors and destructors
Overloading constructors

Task-2

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

Task-3

Write C++ program to implement the following
Function and Operator Overloading
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
- Single Inheritance
- Multiple Inheritance
- Multilevel Inheritance
- Hybrid Inheritance

Task-6

Write C++ program to implement Runtime Polymorphism.

Task-7

Write C++ program to implement the
- Merge sort
- Heap sort

Task-8

Write a C++ program to implement Open addressing collision resolution strategies of Hashing
- Linear probing
- Quadratic probing
- Double Hashing

Task-9

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

Task-10

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

Task-11

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

Task-12

Write C++ programs to Implement Graph Traversal Techniques

BFS

DFS.

Teaching Methodologies

Power Point presentation

White Board

Text Books

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

DATABASES LAB

Course Code: GR15A2067 L:0 T:0 P:2 C:2

Prerequisites

Fundamentals of File Systems and Storage Structures

Course Objectives: The objective of this course is to provide

Formal foundation on the relational model of data
Introducing systematic database design approaches covering conceptual design, logical design and an overview of physical design
Motivating the participants to relate conceptual design, logical design and physical design to one or more commercial product environments as they relate to the developer tasks
Presenting the concepts and techniques relating to query processing by SQL engines

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

Implement a database schema for any given problem.
Populate and query a database using SQL commands.
Implement SQL functions on the retrieved query results.
Develop indexes for better query performance.
Use the views to provide data security.
Implement the aggregate operators to provide grouping of data.
Query using DCL commands to provide security to the data base.

Recommended Systems/Software Requirements

Intel based desktop PC
Mysql/ Oracle latest version Recommended

Task-1

DDL commands (Create, Alter, Drop,Truncate)

Create a table EMP with the following structure.

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

Add a column commission to the emp table. Commission should be numeric with null values allowed.

Modify the column width of the job field of emp table.

Create dept table with the following structure.

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

DEPTNO as the primarykey

Add constraints to the emp table that is empno as the primary key and deptno as the foreign key.

6) Add constraints to the emp table to check the empno value while entering (i.e) empno> 100.

Salary value by default is 5000, otherwise it should accept the values from the user.

Add columns DOB to the emp table.

Add and drop a column DOJ to the emp table.

Insert few rows and truncate those from the emp1 table and also drop it.

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

Insert 5 records into dept table.

Insert 11 records into emp table.

Update the emp table to set the default commission of all employees to Rs1000/- who are working as managers.

Create a table employee with the same structure as the table emp and insert rows into the table using select clauses.

Delete only those who are working as supervisors.

Delete the rows whose empno is 7599.

List the records in the emp table order by salary in ascending order.

List the records in the emp table order by salary in descending order.

Display only those employees whose deptno is 30.

Display deptno from the table employee avoiding the duplicated values.

List the records in sorted order of their employees.

Create a manager table from the emp table which should hold details only about the managers.

List the employee names and the department name in which they are working.

Task-3:SQL Operators

List all employee names , salary and 15% rise in salary.

Display the rows whose empno ranges from 7500 to 7600.

Display the rows whose empno not in range from 7500 to 7600.

Display all the employees in dept 10 and 20 in alphabetical order of names.

List the employee names whose commission is null.

Display all the details of the records whose employee name starts with 'S'.
Display all the details of the records whose employee name does not start with 'M'.
Display the names of employees whose second character is 'i'.
Display all the details of the records whose employee name ends with 'A'.
List all employees which starts with either B or C.
List out the employee names whose salary is greater than 5000 and less than 6000

Task-4:SQLAggregate Functions, Group By clause, Having clause

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

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

Task-6: Exercise on SQL Functions.

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

Task-7: Nested Queries

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

Write a query to display information about employees who earn more than any employee in dept 30.

Display the employees who have the same job as Jones and whose salary >=Fords

Write a query to list the employees in dept 20 with the same job as anyone in dept 30.

List out the employee names who get the salary greater than the maximum salaries of dept with dept no 20,30.

Display the maximum salaries of the departments whose maximum salary is greater than 9000.

Display the maximum salaries of the departments whose minimum salary is greater than 1000 and lesser than 5000.

Task-8: Joins,Set Operators.

Display all the employees and the departments implementing a left outer join.

Display the employee name and department name in which they are working implementing a right outer join.

Display the employee name and department name in which they are working implementing a full outer join.

Write a query to display their employee names and their managers salary for every employee.

Write a query to output the name , job, empno, deptname and location for each dept, even if there are no employees.

Find the name of the manager for each employee.

Display the details of those who draw the same salary.

Display all the dept numbers available with the dept and accdept tables avoiding duplicates.(Create accdept table with the following attributes: dept no, empno, loc)

Display all the dept numbers available with the dept and accdept tables.

10. Display dept no available in both the dept and accdept tables

Task-9: Views

Display only the details of the employees those who are managers.

Display only the details like empno,empname,deptno, deptname of the employees

Display only the details like empno,empname,deptno,deptname of the all the employees except the HOD and CEO .

Display all the views generated.

Execute the DML commands on the view created.

Drop a view.

Task-10: Practices on DCL commands. **Task-11:**Practices on Sequence and indexes.

Task-12: Design a Conceptual Database design and Logical Data design for Hospital Management System.

Text Books

The Complete Reference,3rd edition by James R.Groff, Paul N.Weinberg, Andrew J. Oppel

SQL & PL/SQL for Oracle10g, Black Book, Dr.P.S.Deshpande.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

DIGITAL LOGIC DESIGN LAB

Course Code: GR15A2068 L:0 T:0 P:2 C:2

Prerequisites

Exposure to basic electronics, knowledge about transistor operation and skills of logical thinking.

Course Objectives: The objective of this course is to provide

Exposure to the hardware interaction for the Computer Science Engineering students.
Strengthens the logical thinking skills
Explaining the different combinational circuits
Explaining the different sequential circuits
Introducing simulating environment.

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

Identify the logic gates to solve the real world problems.
Validate and check the various combinational circuits like adders, comparators, multiplexers and checkers.
Verify various sequential circuits like flip flops, registers, counters.
Translate the Boolean expressions using hardware description language.
Implement the sequential and combinational circuits over hardware description language.
Analyze and synthesize logic circuits.
Design any Boolean function using universal gates such as NAND and NOR.

A. COMBINATIONAL CIRCUITS

Realization of Gates (AND, OR, NOT, NAND, NOR)

Exercise: Realize an XOR and XNOR gates

Design half adder and full adder using Gates

Exercise: Design half subtractor circuit

Verification of four bit magnitude comparator

Exercise: Verify an 8bit magnitude comparator

Design a 2 to 1 Multiplexer

Exercise: Implement a 4 to 1 Multiplexer.

Design a 2 to 4 Decoder and 1 to 4 Demultiplexer

Exercise: Implement a 3 to 8 decoder and design a 1 to 4 demultiplexer using 1 to 2 demultiplexer.

Design a 4 bit Parity Checker

Exercise: Design a 4 bit Parity Generator.

SEQUENTIAL CIRCUITS

Verification of truth tables of D and T Flip-Flops

Exercise: Verify JK Flip-Flop

Conversion of JK Flip-Flop to D Flip-Flop

Exercise: Convert JK Flip-Flop to T Flip-Flop

Design of 8 bit left Shift Register **Exercise:**

Design a 4 bit right shift Register

Design a Binary Counter

Exercise: Design of Decade Counter

Design of Asynchronous Up Counter

Exercise: Design an Asynchronous mod Counter

Design of Synchronous Down Counter

Exercise: Design an Synchronous Up/Down Counter

HARDWARE DESCRIPTION LANGUAGE

Simulation of Logic Gates

Simulation of any given Boolean Expression.

Example: Y = A'B + AB'C'

Simulation of Multiplexers, Comparators and Decoders.

Simulation of Sequential Counter.

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

Text Books

Digital Design-Fourth Edition,M.Morris Mano,Pearson Education.

Fundamentals of Logic Design-Roth, 5th Edition, Thomson.

References Books

Switching and Finite Automata Theory by ZviKohavi, Tata McGraw Hill.

Fundamentals of Digital Logic with VHDL Design, Stephen Brown, Zvonko Vranesic, Tata McGraw Hill, Indian edition.

Switching and Logic Design – CVS Rao, Pearson Education

Digital Principles and Design – Donald D.Givone, Tata McGraw Hill.

Fundamentals of Digital Logic and Micro Computer Design, 5th Edition, M.Rafiquzzaman (John Willey)

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENVIRONMENTAL SCIENCE

Course Code: GR15A2001 L:2 T:0 P:0 C:0

Prerequisites: Basic knowledge on basic sciences and natural resources

Course Objectives: The Objectives of this course is to provide

- 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, Importance and Scope of Environmental Studies, 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.

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. Role of individuals in conservation of important natural resources.

Unit-III

Environmental Pollution: Definition, Classification of Pollution, Types of Pollution and Pollutants. Causes, effects and control of – Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution 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. Management: Technological solutions, Preventive methods, control techniques; Green Belt development, Rainwater harvesting, Renewable and alternate 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; Wildlife Protection Act; Municipal solid waste management and handling Act; Biomedical 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; Strategies for achieving sustainable development; Concept of Green buildings and Clean Development Mechanism (CDM).

Teaching Methodology

White board and marker
OHP and Field visit

Text Books

Text Book of Environmental Studies, ErachBarucha. University Press

Text book of Environmental Science and Technology by M.Anji Reddy 2007

Reference Books

Biotechnology & Environmental Chemistry. Surinder Jeswal& Anupama Deswal, DhanpatRai & Co Pvt. Ltd.

A Text Book of Environmental Science. Aravind Kumar. APH Publishing Corporation.

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. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

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. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance.

Unit-III

Markets & New Economic Environment: Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing: Objectives and Policies of Pricing. Methods of Pricing **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.

Unit-IV

Capital Budgeting: Capital: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising capital.
Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method and Internal Rate of Return (IRR) (simple problems).

Unit-V

Introduction to Financial Accounting & Financial Analysis: Accounting Concepts and Conventions - Double-Entry Book Keeping. Accounting Cycle: Journal, Ledger, Trial Balance, Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).
Financial Analysis: Analysis and Interpretation of Liquidity Ratios, Activity Ratios, Capital structure Ratios and Profitability ratios. Du Pont Chart.

Teaching Methodologies

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

Text Books

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

Reference Books

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

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPUTER ORGANIZATION

Course Code: GR15A2076 L:3 T:1 P:0 C:4

Prerequisites: Knowledge of Digital Logic Design.

Course Objectives: The Objectives of this course is to provide

- 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, BCD Adder.

Unit-IV

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

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

Unit-V

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

Teaching Methodologies

Power Point Presentations
Tutorial Sheets
Assignments

Text Books

Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson/PHI

Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.

Reference Books

Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI

Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson

Fundamentals or Computer Organization and Design, - Sivaraama Dandamudi Springer Int. Edition.

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: GR15A2069 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

Power Point presentations
Tutorial Sheets
Assignments

Text Books

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

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

References Books

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

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

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

Prerequisite: Knowledge on C, C++

Course Objectives: The objective of this course is to provide

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

Java The complete reference, 8th editon, Herbert Schildt, TMH.

Understanding OOP with Java, up dated edition, T. Budd, Pearson education.

Reference Books

An Introduction to programming and OO design using Java, J. Nino and F.A. Hosch, John Wiley & sons.

An Introduction to OOP, second edition, T. Budd, pearson education.

Introduction to Java programming 6th edition, Y. Daniel Liang, pearson education.

An introduction to Java programming and object oriented application development, R. A. Johnson-Thomson

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

FORMAL LANGUAGES AND AUTOMATA THEORY

Course Code: GR15A2071 L:3 T:1 P:0 C:4

Prerequisites

Knowledge of basic mathematics is required.

Course Objectives: The objective of this course is to provide

Classification of the machines by the power to recognize languages.
Finite state machines to solve problems in computing
Design deterministic and non-deterministic machines.
Comprehend hierarchy of problems arising in the computer science.
Explore Turing machines and its influence for the design of language recognizers and problem solvers.

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

Describe regular languages and finite automata
Express a broad overview of the theoretical foundations of computer science
Acquire a fundamental understanding of the core concepts in automata theory and formal languages
Design grammars and automata(recognizers) for different language classes
Identify formal language classes and prove language membership properties
Prove and disprove theorems establishing key properties of formal languages and automata
Acquire a fundamental understanding of core concepts relating to the theory of computation and computational models including (but not limited to) decidability and intractability

Unit-I

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

Finite Automata: NFA with transitions - significance, acceptance of languages.

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

Unit-II

Regular Languages: Regular sets, regular expressions, identity rules, Constructing finite automata for a given regular expressions, Conversion of finite automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets.

Unit-III

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

Unit-IV

Context Free Grammars: Ambiguity in context free grammars, Minimisation of context free grammars, Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages, Enumeration of properties of CFL.

Push Down Automata: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence, equivalence of CFL and PDA, interconversion. Introduction to DCFL and DPDA.

Unit-V

Turing Machine: Turing Machine, definition, model, design of TM, computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines.

Computability Theory: Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of problems, Universal Turing Machine, undecidability of posts correspondence problem, Turing reducibility, definition of P and NP problems, NP complete and NP hard problems.

Teaching Methodologies

Board
Markers
LCD Projector.

Text Books

"Introduction to Automata Theory Languages and Computation", Hopcroft H.E. and Ullman J. D, Pearson Education.
"Introduction to Theory of Computation" –Sipser 2nd edition Thomson.

Reference Books

"Introduction to Computer Theory", Daniel I.A. Cohen, John Wiley.
"Introduction to languages and the Theory of Computation", John C Martin, TMH.
"Elements of Theory of Computation", Lewis H.P. and Papadimition C.H. Pearson /PHI.
"Theory of Computer Science - Automata languages and computation" -Mishra and Chandrashekaran, 2nd edition, PHI.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

Course Code: GR15A2072 L:0 T:0 P:2 C:2

Prerequisites: Knowledge on C, C++

Course Objectives: The objective of this course is to provide

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

Constructor
Parameterized constructor
Method overloading
Constructor overloading.

Task-2

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

this
super
static
final

Task-4

Write a java program to implement method overriding
Write a java program to implement dynamic method dispatch.
Write a Java program to implement multiple inheritance.
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.

Write a Java program that reads a file and displays the file on the screen, with a line number before each line.

Write a Java program that displays the number of characters, lines and words in a text file

Task-6

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

Task- 7

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.

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

Task-8

Develop an applet that displays a simple message.

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

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

Task-11

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

Task-12

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.
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

Java;the complete reference,8th editon ,Herbert Schildt, TMH.
Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.
Introduction to Java programming, Sixth edition, Y.Daniel Liang, Pearson Education.
Big Java, 2nd edition, Cay Horstmann, Wiley Student Edition, Wiley India Private Limited

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

OPERATING SYSTEMS LAB

Course Code: GR15A2073 L:0 T:0 P:2 C:2

Course Objectives

Learn different types of CPU scheduling algorithms
Demonstrate the usage of semaphores for solving synchronization problem.
Understand memory management techniques and different types of fragmentation that occur in them.
Explore various page replacement policies.
Understand Banker's algorithm used for deadlock avoidance.
Learn different file organization methods and disk scheduling algorithms.

Course Outcomes

Evaluate the performance of different types of CPU scheduling algorithms.
Implement producer-consumer problem, reader-writers problem, Dining philosophers problem using semaphore.
Implement MVT, MFT, paging techniques in memory management and types of fragmentation that encounter in such techniques.
Compare different page replacement policies.
Simulate Banker's algorithm for deadlock avoidance.
Implement file organization techniques.
Construct algorithms for disk scheduling techniques and evaluate their performance.

Task-1

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

Task-2

Simulate the Producer-Consumer Problem.

Task-3

Simulate the Readers-Writers Problem using Semaphore.

Task-4

Simulate the Dinning Philosophers Problem.

Task-5

Simulate MVT and MFT.

Task-6

Simulate First Fit and Best Fit algorithms for memory management.

Task-7

Simulate Paging Technique of memory management.

Task-8

Simulate all page replacement algorithms

a) FIFO b) LRU c) LFU

Task-9

Simulate Bankers Algorithm for Dead Lock Avoidance.

Task-10

Simulate all file allocation strategies

a) Sequential b) Indexed c) Linked

Task-11

Simulate all File Organization Techniques

a) Single level directory b) Two level directory

Task-12

Simulate the following Disk Scheduling Algorithms

a) First Come-First Serve (FCFS)
b)Shortest Seek Time First (SSTF) c)Elevator (SCAN)
d)Circular SCAN (C-SCAN) e)LOOK
f)C-LOOK

Text Books

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

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

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ADVANCED DATABASES LAB

Course Code: GR15A2074 L:0 T:0 P:2 C:2

Prerequisites

Fundamentals of programming language and SQL.

Course Objectives: The objective of this course is to provide

Designing of PL/SQL anonymous block that execute efficiently.
Exploring the features and syntax of PL/SQL.
Skill of handling runtime errors, stored procedures and functions.
PL/SQL programming constructs and conditionally control code flow (loops, control structures, and explicit cursors).
Introducing the Cursors to process rows.

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

Implement a programming logic for a relational database
Develop a trigger for the table and database
Develop procedure and functions
Implement packages for the tables
Distinguish stored procedures and application procedures
Demonstrate the purpose of PL/SQL Named blocks
Evaluate run time errors using the concept of exception handling

PL/SQL

Recommended Systems/Software Requirements:

Intel based desktop PC
Mysql/Oracle latest version Recommended

Task-1

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

Task-2

Write a PL/SQL block using string functions
Write a PL/SQL program to print a string in a letter by letter format.
Write a PL/SQL program to insert a space after each letter in a given string.

Write a PL/SQL program to print the number of products from product

Table whose prices are between 0 to 50 , 50 to 100,100 to 150 , 150 to 200, 200 to 250.

Write a PL/SQL program to calculate the student grade using case statement.

Task-3

Write a PL/SQL to display the employee details using %type data type.

Write a PL/SQL to display the employee details using %row type data type.

Write a PL/SQL code to retrieve the employee name, join_date, and designation from employee database of an employee whose number is input by the user.

Write a PL/SQL code to calculate tax for an employee of an organization .

Task-4

Write a PL/SQL program to display employee details using cursors.

Write a PL/SQL program to display top 10 employee details based on salary using cursors.

Write a PL/SQL program to display student mark list using cursors.

Write a PL/SQL program to update the salary of employees who earn less than the average.

Task-5

Write a PL/SQL program to update the commission values for all employees with salary less than 2000 by adding Rs.1000 to existing employees.

Write a PL/SQL code to calculate the total salary of first n records of employee table. The value of n is passed to cursor as parameter.

Task-6

Write a row trigger to insert the existing values of the salary table in to a new table when the salary table is updated.

Write a trigger on the employee table which shows the old values and new values of ename after any updations on ename on Employee table.

Task-7

Write a PL/SQL procedure for inserting , deleting and updating an employee table .

Writ a PL/SQL procedure to find the number of students ranging from 100-70%, 69-60%, 59-50% & below 49% in each course from the student_course table given by the procedure as parameter.

Task-8

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

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

Task-9

Write a PL/SQL program to handle predefined exception.
Write a PL/SQL program to handle user defined exception.

Task -10

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

Task -11

Develop banking application by performing the following:
Create customer and transaction tables.
Write a procedure to Insert and delete the values in the customer table.
Write a procedure to update the customer table based on the transactions in the transaction table.

Text Books

"ORACLE PL/SQL by example", Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Edition

"ORACLE DATABASE LOG PL/SQL Programming", SCOTTURMAN, Tata Mc-GrawHill.

"SQL & PL/SQL for Oracle 10g", BlackBook, Dr.P.S. Deshpande.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

VALUE EDUCATION AND ETHICS

Course Code: GR15A2002 L:2 T:0 P:0 C:0

Prerequisites: General awareness on Moral Science

Course Objectives: The objective of this course is to provide

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, Value judgments. Importance of cultivation of values, Sense of duty, Devotion, Self reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National unity, Patriotism, Love for nature, Discipline.

Unit-II

Personality and Behavior Development-Soul and scientific attitude, 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, love for truth, Aware of self destructive habits, Association and cooperation, Doing best, Saving nature.

Unit-III

Character and Competence-Science Vs God, Holy books Vs blind faith, Self management and good health, Equality, Nonviolence, Humanity, Role of women,
All religions and same message, Mind your mind, Self control, Honesty, Studying effectively.

Unit-IV

Professional consciousness Ethics: Ethical Human conduct, Development of human consciousness, Implications of value based living, Holistic technologies, Production systems, Universal human order, Code of conduct.

Unit-V

Legislative procedures: Rights and Rules, Human Rights, Valuable groups, Copy rights, IPR, RTI Act, Lokpal, Ombudsman.

Text Books

Chakraborty,S.K., Values and Ethics for Originations Theory and Practice, Oxford University Press, New Delhi, 2001

R R Gaur, R Saugal, G P Bagaria, “A foundation course in Human values and Professional Ethics”, Excel books, New Delhi, 2010.

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GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

GENDER SENSITIZATION

Course Code: GR15A2106 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

GENDER STUDIES: Knowledge: Through the Lens of Gender (Towards a World of Equals: Unit – 5) Point of View. Gender and the Structure of Knowledge. Further Reading. Unacknowledged Women Artists of Telangana.Whose History? Questions for Historians and Others (Towards a World of Equals: Unit – 9) Reclaiming a Past. Writing other Histories. Fur**,** her Reading. Missing Pages from Telangana History.

Text Books

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

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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.

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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

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.

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

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Menon, Nivedita. Seeing Like a Feminist. New Delhi. Zubaan-Penguin Books, 2012.

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.

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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/

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K. Kapadia. The Violence of Development: The Politics of Identity, Gender and Social Inequalities in India. London: Zed Books, 2002.

S. Benhabib. Situating the self: Gender, Community, and Postmodernism in Contemporary Ethics, London: Routledge, 1992.

Virginia Woolf A Room of One`s Oxford: Black Swan. 1992.

T. Banuri and M. Mahmood, Just Development: Beyond Adjustment with a Human Face