ACADEMIC REGULATIONS PROGRAM STRUCTURE and DETAILED SYLLABUS

Bachelor of Technology
(Information Technology)

(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.

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

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

3. **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.

4. **Programme Pattern:**
   a) 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.
   b) Each Academic year of study is divided into two semesters.
   c) Minimum number of instruction days in each semester is 90.
   d) The total credits for the Programme is 200. Typically each semester has 25 credits.
   e) 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).
   f) A student has a choice of registering for credits from the courses offered in the programme ensuring the total credits in a semester are between 21 and 29.
   g) All the registered credits will be considered for the calculation of final CGPA.
   h) 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	06

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

5. **Award of B.Tech Degree:** A student will be declared eligible for the award of B. Tech Degree if he/she fulfills the following academic requirements:
   a) 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.
   b) A student has to register for all the 200 credits and secure all credits.
   c) A student has to acquire a minimum of 5.00 SGPA in each semester for the award of B. Tech degree.
   d) 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.
   e) 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.

6. **Attendance Requirements**
   a) A student shall be eligible to appear for the semester-end examinations if he/she puts in a minimum of 75% of attendance in aggregate in all the courses concerned in the semester.
   b) Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in a semester may be granted. A committee headed by Dean (Academic Affairs) shall be the deciding authority for granting the condonation.
   c) Students who have been granted condonation shall pay a fee as decided by the Academic Council.
   d) Shortage of Attendance more than 10%(attendance less than 65% in aggregate) shall in no case be condoned.
   e) Students whose shortage of attendance is not condoned in any semester are detained and are not eligible to take their end examinations of that semester. They may seek re-registration for that semester when offered next with the academic regulations of the batch into which he/she gets re-registered.

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

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

    b) **Distribution and Weightage of marks**

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

    c) **Continuous Internal Evaluation and Semester End Examinations:**

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

Assessment Procedure :

S.No	Component of Assessment	Marks Allotted	Type of Assessment	Scheme of Examinations
1	Theory	30	Internal Exams & Continuous Evaluation	1) Two mid semester examinations shall be conducted for 20 marks each for 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 : 5 marks Assessment 4) Attendance : 5 marks
		50	Semester-end examination	The semester-end examination is for a duration of 3 hours.

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

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

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

g) **Major Project:** The project work is evaluated for 200 marks. Out of 200, 50 marks shall be for internal evaluation and 150 marks for the external evaluation. The supervisor assesses the student for 25 marks (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.

h) **Engineering Graphics:**
   • Two internal examinations, each is of 10 marks .The average of the two internal tests shall be considered for the award of marks.
   • Submission of day to day work - 15 marks.
   • Attendance - 5 marks.

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

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

10. 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.

    b) **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.

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

12. **Academic Requirements:**

    a) A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or laboratories if he / she securesnot less than 35% of marks in the Semester-end Examination and a minimum of 40% of the sum total of the Internal Evaluation and Semester-end examination taken together.

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

    c) 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.

    d) 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.

    e) 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.

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

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

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

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

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

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

13. **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

14. **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.

15. **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.

16. **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.

17. **General Rules**
    a) The academic regulations should be read as a whole for the purpose of any interpretation.
    b) In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.
    c) In case of any error in the above rules and regulations, the decision of the Academic Council is final.
    d) The college may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the college.

Academic Regulations for B.Tech (Lateral Entry) under GR15

1. **All regulations as applicable for B.Tech Four year degree programme (Regular) will hold good for B.Tech (Lateral Entry Scheme) except for the following rules**
    a) Pursued programme of study for not less than three academic years and not more than six academic years.
    b) 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.
    c) Students who fail to fulfil all the academic requirements for the award of the degree within six academic years from the year of their admission, shall forfeit their seat in B.Tech programme.

2. **Academic Requirements**
    a) A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or laboratories if he / she secures not less than 35% of marks in the Semester-end Examination and a minimum of 40% of the sum total of the Internal Evaluation and Semester-end examination taken together.
    b) A student shall be promoted to the next semester only when he/she satisfies the requirements of the previous semester.
    c) 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.
    d) 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.

3. **Award of Class:** After a student satisfies all the requirements prescribed for the completion of the Degree and becomes eligible for the award of B. Tech Degree by JNTUH, he/she shall be placed in one of the following four classes (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 (IT) PROGRAMME STRUCTURE

I B.Tech (IT)   **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 (IT)   **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 (IT)   **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	GR15A2053	Digital Electronics Lab	-	-	2	2	4	25	50	75
PC	GR15A2075	Database Management Systems 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 (IT)   **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	GR15A2076	Computer Organization	3	1	-	4	5	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	GR15A2077	Computer Networks	3	1	-	4	5	30	70	100
PC	GR15A2072	Object Oriented Programming through Java Lab	-	-	2	2	4	25	50	75
PC	GR15A2078	Operating systems and Computer Networks Lab	-	-	2	2	4	25	50	75
PC	GR15A2079	Web Designing 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 the student with
- Introduce the ideas of linearity and linear systems, which lie at the core level of many engineering concepts
- Explore the extensions of differential calculus, which form the stepping stones to a broader subject called "approximation theory"
- Learn the skill of seeing a mathematical equation in many commonly occurring natural phenomena and acquire preliminary skills to predict their behavior
- Provide an over view of mean value theorems and its applications
- Discuss the significant applications of higher order differential equations.

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

Unit-I
Linear Algebra and Matrix eigen value problem: Rank of a matrix,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

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

Text Books

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

References Books

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

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ADVANCED CALCULUS

Course Code: 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

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

Text Books

1. Advanced Engineering Mathematics: R.K.Jain and S.R.K.Iyengar Narosa Publishing House
2. Schaum's outline series on Vector Analysis
3. Higher Engineering Mathematics: B.S.Grewal-Khanna Publications

Reference Books

1. Advanced Engineering Mathematics: Erwin Kreyszig-Wiley
2. Calculus and Analytical Geometry-Thomas & Finney-Narosa
3. Higher Engineering Mathematics: B.S.Grewal-Khanna Publications

GOKARAJU RANGARAJU
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 the student with
- Identify the importance to acquire Basic Language Skills in English.
- Relate the vocabulary, Grammar and Structures in English.
- Practice to analyze and express their ideas in the new context.
- Demonstrate the learnt public speaking skills in an enthusiastic manner.
- Integrate oral and written communication skills.

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

Unit-I

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.

2. 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
1. Chapter Entitled The Connoisseur from "Enjoying Every day English", Published by Sangam Books, Hyderabad
2. 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
1. Chapter Entitled Bubbling Well Road from "Enjoying Every day English", Published by Sangam Books, Hyderabad
2. 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
1. Chapter entitled The Cuddalore Experience from "Enjoying Every day English", Published by Sangam Books, Hyderabad
2. 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
1. Enjoying Every day English by A. Rama Krishna Rao- Sangam Books
2. Inspiring Speeches and Lives by Dr.B.Yadava Raju, Dr.C.Muralikrishna, Maruthi Publications.

Reference Books
1. Murphy's English Grammar with CD, Murphy, Cambridge University Press.
2. Effective Technical Communication, M. Ashraf Rizvi, Tata McGraw Hill.
3. Technical Communication, Meenakshi Raman, Sangeeta Sharma, Oxford higher Education.
4. English for Engineers Made Easy, Aeda Abidi, Ritu Chaudhry, CengageLearning.
5. Communicate or Collapse, Pushp Latha, Sanjay Kumar, PHI Learning Pvt.Ltd.
6. Communication Skills, Sanjay Kumar, Pushp Latha, Oxford Higher Education.
7. 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

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

Text Books

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

Reference Books

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPUTER PROGRAMMING

Course Code: 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
1. White board and marker
2. Power point presentations

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

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

FUNDAMENTALS OF ELECTRONICS ENGINEERING

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

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENGINEERING WORKSHOP

Course Code: GR15A1025   L:0 T:0 P:2 C:2

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

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

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

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

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

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

Unit-IV
Tin- smithy – 4:
  4.1 Introduction to tin -smithy shop, use of hand tools and accessories e.g. different types of hammers, hard and soft mallet, sheet and wire gauge, necessary allowance required during job fabrication, selection of material and specifications.
  4.2 Introduction and demonstration of hand tools used in tin -smithy shop.
  4.3 Introduction and demonstration of various raw materials used in sheet metal shop e.g. M.S. sheet, galvanized-iron plain sheet, galvanised corrugated sheet, aluminium sheets etc.
      corrugated sheet, aluminium sheets etc.
      corrugated sheet, aluminium sheets etc.
  4.4. Preparation of a rectangle tray and open scoop/ funnel.

Reference Books

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

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

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

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

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

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENGINEERING PHYSICS LAB

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

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

List of Experiments

1. Determine the energy gap of a given semiconductor.

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

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

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

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

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

7. Determine the bending losses in a given optical fibers.

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

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

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

11. Measure Ac voltage and frequency through CRO.

12. Measure Resistance and Capacitance by using digital multimeter.

13. 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
   a) The heights of three students are 165, 148, 154 cm. respectively. Write a C program to sort the heights of the students in descending order.

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

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

      (a) Sum of numbers

      (b) Difference of numbers

      (c) Product of the numbers

      (d) Division of the numbers.

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

   d) In a mathematical number sequence let the first and second term in the Sequence are 0 and 1. Subsequent terms are formed by adding the preceding terms in the sequence.

Write a C program to generate the first 10 terms of the sequence.

Task-II

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

b) The reliability of an electronic component is given by reliability r=e$^{-\lambda t}$ where λ is the component failure rate per hour and t is the time of operation in hours. Determine the reliability at various operating times from 0 to 3000 hours by plotting a graph using a C program. The failure rate λ is 0.001. Plot the graph with a special symbol.

c) Write a C program to accept the date of birth and the current date to find the age of the person . The output should specify the age of a person in terms of number of years, months and days.

Task- III

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

b) For a certain electrical circuit with an induction (L) and Resistance (R) , the damped natural frequency is given by f=$\sqrt{}$(1/LC – R^2/ 4C^2). Write a C program to calculate the frequency for different values of C starting from 0.01 to 0.1.

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

Task - IV

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

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

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

Task - V

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

b) Write a C program to sort the names of 5 students in the alphabetical order.
    Ex: Rita, Sneha, Priti, Briya, kitti as Briya , Kitti, Priti, Rita, Sneha

c) Write a C program to print all the rotations of a given string.
    Ex: Rotations of the string "NEWS" are NEWS EWSN   WSNE   SNEW

Task - VI

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

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

Task - VII

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

Task - VIII

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

       i) To find the factorial of a given integer.

       ii) To print the Fibonacci sequence

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

Task- IX

a)   Using pointers, write a function that receives a character string and a character as argument and deletes all occurrences of this character in the string.

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

Task -X

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

       i) Addition

       ii) Subtraction

       iii) Multiplication

       iv) Division

       (Note: represent complex number using a structure.)

Task-XI

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

b)   Let us suppose that a hotel consists of name, address, average room charge and number of rooms. Then write a function to print out hotels with room charges less than a given value.(structures and functions)

Task - XII

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

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

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

Task - XIII

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

b)   Write a C program to reverse the first n characters in a file.

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

Task-XIV

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

b)   Write a C program to solve Towers of Hanoi

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

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

TRANSFORM CALCULUS AND FOURIER SERIES

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

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

Unit-I
Improper Integrals and Beta, Gamma Functions: Beta and Gamma functions – Their properties – Evaluation of improper integrals in terms of Beta and Gamma functions.

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

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

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

NUMERICAL METHODS

Course Code: GR15A1004   L:2 T:1 P:0 C:3

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

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

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

Unit-I
Root finding techniques and Numerical solution of linear algebraic systems: Bisection method-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
1. Tutorial sheets uploaded in website
2. NPTEL video lectures
3. MATLAB exercises for visualization

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

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

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BASIC ELECTRICAL ENGINEERING

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

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

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ENGINEERING CHEMISTRY

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

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

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

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ENGINEERING GRAPHICS

Course Code: 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
1. Engineering Drawing, N.D. Bhat / Charotar

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

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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

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

Text Books

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

Reference Books

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

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IT WORKSHOP

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

Suggested Tutorials on Lab:
Tutorial/Lab 1: Installation of Ubuntu and RedHat Linux on the computer. Lab instructors should verify the installation and follow it up with viva
Tutorial/Lab 2: Students would be exposed to create word documents with images, tables, formula and with additional word processing features, Power point presentation, Excel and access. Lab instructors should verify the installation and follow it up with viva.
Tutorial/Lab 3: Understand the concepts of networking topics.
Tutorial/Lab 4: DDL and DML statements
Tutorial/Lab5: Designing of static web page and verify it.

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ENGINEERING CHEMISTRY LAB

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

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

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

11. Preparation of Thiokol rubber.

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

Reference Books

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

2. 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.

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

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BUSINESS COMMUNICATION AND SOFT SKILLS

Course Code: 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 an analytical manner.
- Accredit the activity of sequencing ideas in an efficacious style.
- Evaluate and use a neutral and correct form of English.
- Formulate behavior in various formal situations.
- Integrate business communication & soft skills to meet the requirement of corporate communication.

Unit-I
Just A Minute (JAM): 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

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

Software Used

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

SYLLABUS
II-Year

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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
1. Chalk &Talk
2. Ppts

Text Books

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

Reference Books

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

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

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

Unit-I
Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, Tautology, Equivalence implication, Normal forms.

Predicates: Predicative logic, Free and Bound variables, Rules of inference, Consistency, Proof of contradiction.

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

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

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

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

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

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

Teaching Methodologies
1. Board
2. Markers
3. LCD Projector

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

Reference Books

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

DATABASE MANAGEMENT SYSTEMS

Course Code: GR15A2063   L:3 T:1 P:0 C:4

Prerequisites
- Fundamentals of File Systems and Storage Structures

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

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

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

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

Unit-III

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

Unit-IV

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

Unit-V

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

Teaching Methodologies
1. Power Point presentations
2. Tutorial Sheets
3. Assignments
4. Lab experiments with Oracle Software

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

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

ADVANCED DATA STRUCTURES THROUGH C++

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

Prerequisite
- Computer programming language.(CPDS)

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

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

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

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

Unit-III
Priority Queues: Definition, ADT, realizing a priority queue using heaps, definition, insertion, deletion, application-heap sort.

Dictionaries: Linear list representation, operations-insertion, deletion and searching, Hash table representation-hash functions, collision resolution strategies-separate chaining and open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing.

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

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

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

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

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

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

DIGITAL LOGIC DESIGN

Course Code: GR15A2065   L:3 T:1 P:0 C:4

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

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

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

Unit–I
Binary Systems: Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic.
Boolean Algebra And Logic Gates: Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates, Integrated Circuits.

Unit–II

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

Unit–III

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

Unit–IV

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

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

Unit–V

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

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

Teaching Methodologies
1. Power Point presentations
2. Tutorial Sheets
3. Assignments

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

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

ADVANCED DATA STRUCTURES THROUGH C++ LAB

Course Code: GR15A2066   L:0 T:0 P:2 C:2

Prerequisites
- Computer programming language(CPDS)

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

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

Task-1
Write C++ program to implement the following
- a) Constructors and destructors
- b) Overloading constructors

Task2
Write C++ program to implement the following variations of Friend Concepts
- a) External Function declared as Friend
- b) Member Function declared as Friend
- c) One Class declared as Friend of another class.

Task-3
Write C++ program to implement the following
- a) Function and Operator Overloading
- b) Function and Operator Overloading using FRIEND concept

Task-4
Write C++ program to implement Function and Class Templates

Task-5
Write a C++ program to implement
- a) Single Inheritance
- b) Multiple Inheritance
- c) Multilevel Inheritance
- d) Hybrid Inheritance

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

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

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

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

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

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

Task-12

Write C++ programs to Implement Graph Traversal Techniques
   a) BFS
   b) DFS.

Teaching Methodologies
   1. Power Point presentation
   2. White Board

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

DIGITAL ELECTRONICS LAB

Course Code: GR15A2053   L:0 T:0 P:2 C:2

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

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

LIST OF EXPERIMENTS
1.DESIGN AND SIMULATION OF COMBINATIONAL CIRCUITS USING VHDL
Experiment 1:   Realization of Gates
Experiment 2:   Half adder, Full adder
Experiment 3:   Magnitude comparator
Experiment 4:   Decoder
Experiment 5:   Multiplexer
Experiment 6:   Demultiplexer
Experiment 7:   Binary to Grey Code Converter
Experiment 8:   Parity Checker

2.DESIGN AND SIMULATION OF SEQUENTIAL CIRCUITS USING VHDL
Experiment 9:   D and T Flip-Flops
Experiment 10:   Frequency Divider
Experiment 11:   Left Shift Register
Experiment 12:   Serial to Parallel Shift Register
Experiment 13: Binary Counter
Experiment 14: Asynchronous BCD Up Counter
Experiment 15: Synchronous Down Counter

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

Lab methodologies
• Assignments
• Lab experiments with Xlinix Software

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

DATA BASE MANAGEMENT SYSTEMS LAB

Course Code: GR15A2075   L:0 T:0 P:2 C:2

Prerequisites
- Fundamentals of File Systems
- Fundamentals of Storage Structures

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

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

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

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

3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)

5. i)Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)

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

6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.

7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USER defined Exceptions, RAISE-APPLICATION ERROR.

8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.

9. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.

10. Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.

11. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

12. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

Text Books

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

2. ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc-Graw Hill.

3. SQL & PL/SQL for Oracle 10g, Black Book, Dr. P. S. Deshpande.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENVIRONMENTAL SCIENCE

Course Code: 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
1. White board and marker
2. OHP and Field visit

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

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

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

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

Course Outcomes: After studying this course the engineering students - the prospective technocrats or techno-managers will be in a position to:
- understand the markets and competition;
- forecast the demand;
- plan the operations and the production;
- choose an appropriate form of organisation;
- know the cost and decide the price of the products and/or services produced, and
- understand the financial statements and make financial analysis.

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

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

Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. 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
1. **Aryasri:** Managerial Economics and Financial Analysis, TMH, 2009.
2. **Atmanand:** Managerial Economics, Excel, 2008.

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPUTER ORGANIZATION

Course Code: 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 the student
- 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
1. Power Point Presentations
2. Tutorial Sheets
3. Assignments

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

Reference Books

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

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

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

4. Computer Architecture a quantitative approach, John L. Hennessy and David A. Patterson, Fourth Edition Elsevier 5. Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publications.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

OPERATING SYSTEMS

Course Code: 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
1. Power Point presentations
2. Tutorial Sheets
3. Assignments

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

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

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
1. Java The complete reference, 8th editon, Herbert Schildt, TMH.
2. Understanding OOP with Java, up dated edition, T.Budd, Pearson education.

Reference Books
1. An Introduction to programming and OO design using Java, J. Nino and F.A. Hosch, John Wiley & sons.
2. An Introduction to OOP, second edition, T. Budd, pearson education.
3. Introduction to Java programming 6th edition, Y. Daniel Liang, pearson education.
4. An introduction to Java programming and object oriented application development, R. A. Johnson-Thomson

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPUTER NETWORKS

Course Code: GR15A2077   L:3 T:1 P:0 C:4

Prerequisites
- IT Workshop

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

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

Unit-I
Introduction: Uses of Computer Networks, Network Hardware, Network Software, Reference Models: OSI, TCP/IP, Examples Networks: Arpanet, Internet, ATM.
Physical Layer: Guided Transmission media, Wireless Transmission Media, Communication Satellites. The public Switched Telephone Network, the Mobile Telephone Network

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

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

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

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

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

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

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

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

Prerequisites: Knowledge on C, C++

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

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

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

Task-1: Write java programs that implement the following
    a) Constructor
    b) Parameterized constructor
    c) Method overloading
    d) Constructor overloading.

Task-2
    a) Write a Java program that checks whether a given string is a palindrome or not.
        Ex: MADAM is a palindrome.
    b) Write a Java program for sorting a given list of names in ascending order.
    c) Write a Java Program that reads a line of integers, and then displays each integer and the sum of all the integers (Use StringTokenizer class of java.util)

Task-3: Write java programs that uses the following keywords
- a) this
- b) super
- c) static
- d) final

Task-4
- a) Write a java program to implement method overriding
- b) Write a java program to implement dynamic method dispatch.
- c) Write a Java program to implement multiple inheritance.
- d) Write a java program that uses access specifiers.

Task-5
- a) Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
- b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
- c) Write a Java program that displays the number of characters, lines and words in a text file

Task-6
- a) Write a Java program for handling Checked Exceptions.
- b) Write a Java program for handling Unchecked Exceptions.

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

Task-8
- a) Develop an applet that displays a simple message.
- b) Develop an applet that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named "Compute" is clicked.

Task-9

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

Task-10

    a)   Write a Java program for handling mouse events.

    b)   Write a Java program for handling key events.

Task-11

    1.   Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields Num1 and Num 2.

        The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1or Num2 were not an integer, the program would throw Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception and display the exeption in a message dialog box.

Task -12

    a)   Write a java program that simulates traffic light. The program lets the user select one of three lights: red, yellow or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No l Light is on when the program starts.

    b)   Write a Java program that allows the user to draw lines, rectangles and ovals.

Task -13

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

Text Books

    1.   Java;the complete reference,8th editon ,Herbert Schildt, TMH.

    2.   Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.

    3.   Introduction to Java programming, Sixth edition, Y.Daniel Liang, Pearson Education.

    4.   Big Java, 2nd edition, Cay Horstmann, Wiley Student Edition, Wiley India Private Limited

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

OPERATING SYSTEM AND COMPUTER NETWORKS LAB

Course Code: GR15A2078   L:0 T:0 P:2 C:2

Prerequisites
- Fundamentals of computer science
- Fundamentals of data communication

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

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

PART- I
Objectives
To understand the operating System functionalities System/ Software
requirement
1. Simulate the following CPU scheduling algorithms
   a) Round Robin   b) SJF   c) FCFS   d) Priority
2. Simulate all file allocation strategies
   a) Sequential   b) Indexed   c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques
   a) Single level directory   b) Two level directory

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

PART-II

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

Teaching methodologies

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

Text Books

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

Reference Books

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

WEB DESIGNING LAB

Course Code: GR15A2079   L:0 T:0 P:2 C:2

Prerequisites
- Fundamentals of HTML

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

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

HTML& HTML5

Introduction: HTML Basic, HTML Elements, HTML Attribute, Structures of HTML,Basic HTML Tags,Lists, Links, Images, Tables ,Forms, Textfields
RadioButtons, Frames, HTML5 I/P Types, HTML5 Input attributes,HTML5 Form Elements, HTML5 Form attributes,HTML5 Web Storage, Web Workers.
Cascading style sheets 3.0 Introduction to css,types of css,css3 Borders, Backgrounds, CSS3 Gradients, CSS3 Text Effects, CSS3 Transitions, CSS32D Transforms, CSS3 3D Transforms, Css3 Animations, Css3 Multiple Columns, User Interface.

Java Script

JS Introduction, JS Output, JS Statements, JS Comments, variables, JS Data Types JS Objects JS Functions and operators JS Array, Boolean, JS MATH,REGEXP, Validation of Forms ,Slide Show Effects in Js ,Date / Calendar Integration.

Designing Applications
- Move, Marque, Lasso, Crop, Image Manipulation Tools
- Brushes, Patterns, Gradients
- Pen, Shape, Text Tools
- Working with Layers, Grouping and Smart Objects
- Image Adjustments, Layer Masking, Layer Clipping
- Using Blending Options to create unique effects
- Filter Effects
- Brochure Designing
- Designing a Logo
- Creating a Business Card
- Design Banners for Website

Designing a Static Website
- Template Design using various tags
- Creating a Site for Static Project using various tool bars.

Creating a Flash Movie
- Shape Tween and Motion Tween
- Creating Flash Banners
- Creating Flash Website
- Frame Animation
- Creating Flash Intro's

Wordpress

Overview, installation + Configuration, Word press Blogs vs. Websites

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

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

Reference Books

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

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

GENDER SENSITIZATION

Course Code: 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

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

Text Books

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

Reference Books

1. Sen, Amartya. "More than Once Million Women are Missing". New York Review of Books 37.20 (20 December 1990). Print. `We Were Making History……' Life Stories of Women in the Telangana People`s Struggle. New Delhi : Kali for Women, 1989.
2. TriptiLahiri. "By the Numbers: Where India Women Work." Women`s Studies Journal (14 November 2012) Available online at: http://blogs. Wsj.com/India real time/2012/11/14/by – the –numbers – where- Indian- women-works
3. K. Satyanarayana and Susie Tharu (Ed.) Steel Nibs Are Sprouting: New Dalit Writing From South India, Dossier 2: Telugu And Kannada Http://harpercollints.co.in/BookDetail.asp?Book Code=3732

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

Academic Regulations
Programme Structure
&
Detailed Syllabus

Bachelor of Technology
(B. Tech)
(Four Year Regular Programme)
(Applicable for Batches admitted from 2015)

Department of Civil Engineering

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

Academic Regulations
GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY,
HYDERABAD
DEPARTMENT OF CIVIL ENGINEERING (B. Tech)
GR15 REGULATIONS

GokarajuRangaraju Institute of Engineering and Technology 2015 Regulations (GR15 Regulations) are given hereunder. These regulations govern the programmes offered by the Department of Civil Engineering with effect from the students admitted to the programmes in 2015-16 academic year.

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

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

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

4. **Programme Pattern:**

a) **A student is introduced to "Choice Based Credit System (CBCS)"**

b) Each Academic year of study is divided into two semesters.

c) Minimum number of instruction days in each semester is 90.

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

2

e) **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).**

f) **A student has a choice of registering for credits from the courses offered in the programme ensuring the total credits in a semester are between 21 and 29.**

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

h) 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	5	10
7	PW	Project Work	10	15
8	MC	Mandatory Course	Non credit	

1. **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) 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.

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

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

d) 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.

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

6. Attendance Requirements

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

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

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

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

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

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

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

b) **Distribution and Weightage of marks**

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

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

Assessment Procedure :

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

2	Practical	25	Internal Exams &Continuous Evaluation	20 marks are allotted for internal lab exam **i) Internal Exam-10 marks** **ii) Record-5 marks** **iii) Continuous Assessment-5 marks** **iv) Attendance-5 marks**
		50	Semester-end examination	The semester-end examination is for a duration of 3 hours

d)Industry Oriented Mini Project: The Mini Project is to be taken up with relevance to Industry and is evaluated for 75 marks. Out of 75 marks, 25 marks are for internal evaluation and 50 marks are for external evaluation. The supervisor continuously assesses the students for 15 marks (Attendance – 5 marks, Continuous Assessment – 5 marks, Report – 5 marks). At the end of the semester, Mini Project shall be displayed in theroad show at the department level for the benefit of all students and staff and the same is to be evaluated by Mini Project Review Committeefor 10 marks. The mini project report shall be presented before Project Review Committee in the presence of External Examiner and the same is evaluated for 50 marks. Mini Project Review Committee consists of HOD, Mini Project Coordinator and Supervisor.

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

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

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g) Major Project: The project work is evaluated for 200 marks. Out of 200, 50 marksshall be for internal evaluation and 150 marksfor the external evaluation. The supervisor assesses the student for 25 marks (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.

h) Engineering Graphics:

- Two internal examinations, each is of 10 marks .The average of the two internal tests shall be considered for the award of marks.
- Submission of day to day work - 15 marks.
- Attendance - 5 marks.

6.   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.

7.   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.

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

b)   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.

9. **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.

10. **Academic Requirements:**

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

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

c) **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 up to and including II year II Semester from all regular and supplementary examinations, whether or not the candidate takes the examinations.**

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

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

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

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

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

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

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

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

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

13. **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):

14. **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.

15. **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.

16. **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.

17. **General Rules**

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

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

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

   d) The college may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall

be applicable to all the students with effect from the dates notified by the college.

I BTECH   **I SEMESTER**

Group	Subject code	Name of subject	L	T	P	Total credits	Total Hours	Total Marks
BS	GR15A1001	Linear Algebra and Single Variable Calculus	2	1		3	4	100
BS	GR15A1002	Advanced Calculus	2	1		3	4	100
BS	GR15A1008	Engineering Chemistry	2	1		3	4	100
ES	GR15A1023	Engineering Graphics	1		2	3	5	100
ES	GR15A1018	Basic Electrical Engineering	3	1		4	5	100
ES	GR15A1012	Engineering Mechanics (Statics)	2	1		3	4	100
HS	GR15A1024	Business Communication and Soft Skills			2	2	4	75
ES	GR15A1026	IT Workshop			2	2	4	75
BS	GR15A1030	Engineering Chemistry lab			2	2	4	75
		TOTAL				**25**	**38**	**825**

Group	Subject code	Name of subject	L	T	P	Total credits	Total Hours	Total Marks
BS	GR15A1003	Transform Calculus and Fourier Series	2	1		3	4	100
BS	GR15A1004	Numerical Methods	2	1		3	4	100
BS	GR15A1007	Physics for Engineers	2	1		3	4	100
HS	GR15A1005	English	2	1		3	4	100
ES	GR15A1011	Computer Programming & Data structures	2	1		3	4	100
ES	GR15A1020	Engineering Mechanics (Dynamics)	3	1		4	5	100
ES	GR15A1025	Engineering Workshop			2	2	4	75
BS	GR15A1029	Engineering Physics lab			2	2	4	75
ES	GR15A1028	Computer Programming & Data Structures lab			2	2	4	75
		Total				**25**	**37**	**825**

I BTECH   **I SEMESTER**

Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
PC	GR15A2003	Building Materials and Construction Planning	3	1		4	5	100
PC	GR15A2004	Electrical Technology	2	1		3	4	100
PC	GR15A2005	Strength of Materials-I	3	1		4	5	100
PC	GR15A2006	Surveying	3	1		4	5	100
PC	GR15A2007	Fluid Mechanics	3	1		4	5	100
PC	GR15A2008	Fluid Mechanics Lab			2	2	4	75
PC	GR15A2009	Surveying Lab - I			2	2	4	75
PC	GR15A2010	Computer Aided Drafting of Building Lab			2	2	4	75
		Total credits/Hours/Marks				**25**	**36**	**725**
MC	GR15A2002	Value Education and Ethics			2	2	2	100
MC	GR15A2106	Gender sensitization Lab			2	2	2	75

Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
PC	GR15A2011	Probability and Statistics	2	1		3	4	100
PC	GR15A2012	Strength of Materials-II	3	1		4	5	100
PC	GR15A2013	Hydraulics and Hydraulic Machinery	3	1		4	5	100
PC	GR15A2014	Engineering Geology	3	1		4	5	100
PC	GR15A2015	Structural Analysis	3	1		4	5	100
PC	GR15A2016	Strength of Materials Lab			2	2	4	75
PC	GR15A2017	Hydraulics and Hydraulic Machinery Lab			2	2	4	75
PC	GR15A2018	Surveying Lab - II			2	2	4	75
		Total credits/Hours/Marks				**25**	**36**	**725**
MC	GR15A2001	Environmental Science			2	2	2	100

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Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
PC	GR15A3001	Concrete technology	3	1		4	5	100
PC	GR15A3002	Design of Reinforced Concrete Structures	3	1		4	5	100
HS	GR15A2014	Managerial Economics and Financial Analysis	3	1		4	5	100
Open Elective 1			**2**	**1**		**3**	**4**	**100**
Professional Elective 1			**3**	**1**		**4**	**5**	**100**
PE	GR15A3004	Advanced Structural Analysis						
PE	GR15A3104	Air Pollution and Control Engineering						
PE	GR15A3105	Environmental Impact assessment						
PC	GR15A3005	Concrete Technology Lab			2	2	4	75
PC	GR15A3006	Engineering Geology Lab			2	2	4	75
BS	GR15A3100	Advanced English Communication Skill Lab			2	2	4	75
		Total	**14**	**5**	**6**	**25**	**36**	**725**

Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
PC	GR15A4001	Geotechnical Engineering-II	3	1		4	5	100
PC	GR15A4002	Estimating & Costing	3	1		4	5	100
PC	GR15A4003	Environmental Engineering	3	1		4	5	100
Open Elective 3			**2**	**1**		**3**	**4**	**100**
Professional Elective 3			**3**	**1**		**4**	**5**	**100**
PE	GR15A4007	Finite Element Methods						
PE	GR15A4004	Ground Water Development & Management						
PE	GR15A4009	Ground Improvement Techniques						

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Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
PC	GR15A3001	Concrete technology	3	1		4	5	100
PC	GR15A3007	Design of Steel Structures	3	1		4	5	100
PC	GR15A3102	Management Science	3	1		4	5	100
PC	GR15A3010	Geotechnical Engineering-I	3	1		4	5	100
Open Elective 2			**2**	**1**		**3**	**4**	**100**
Professional Elective 2			**3**	**1**		**4**	**5**	**100**
PE	GR15A3108	Advanced Water Resource Engineering						
PE	GR15A3011	Disaster Management and Mitigation						
PE	GR15A3012	Advanced Reinforced Concrete Structural Design						
PC	GR15A3013	Geotechnical Engineering Lab			2	2	4	75
PC	GR15A3014	Highway Materials Lab			2	2	4	75
PC	GR15A3101	Industry Oriented Mini Project			2	2	4	75
		Total	**14**	**5**	**6**	**25**	**36**	**725**

Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
PC	GR15A4010	Irrigation Design & Drawing			2	2	4	75
PC	GR15A4011	Environmental Engineering Lab			2	2	4	75
PC	GR15A4012	Computer Applications in Structural Engineering (CASE) Lab			2	2	4	75
		Total	**14**	**5**	**6**	**25**	**36**	**725**

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Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
PC	GR15A4013	Construction Technology & Project Management	2	1		3	4	100
Professional Elective 4			**3**	**1**		**4**	**5**	**100**
PE	GR15A4005	Prestressed Concrete						
PE	GR15A4015	Pavement Analysis & Design						
PE	GR15A4016	Water Shed Management						
Professional Elective 5			**3**	**1**		**4**	**5**	**100**
PE	GR15A4017	Remote Sensing & GIS						
PE	GR15A4018	Airport, Docs & Harbour Engineering						
PE	GR15A4145	Advanced Steel Structural Design						
PC	GR15A4020	GIS Lab			2	2	4	75
SPW	GR15A4142	Comprehensive Viva			1	1	2	50
SPW	GR15A4143	Seminar			1	1	2	100
SPW	GR15A4144	Major Project			10	10	14	200
		Total	8	3	**14**	**25**	**36**	**725**

	Open Elective 1	Course Title	Department Offering
OE - I	GR15A3151	Water Resources Engineering	CE
	GR15A3152	Solar & Wind Energy Systems	EEE
	GR15A3153	Applied Thermodynamics	ME
	GR15A3154	Principles of E- Commerce	CSE
	GR15A3155	Datamining and Applications	IT
	GR15A3156	Computer Architecture and Organization	ECE
	Open Elective 2	**Course Title**	**Department Offering**
OE - II	GR15A3161	Transportation Engineering	CE
	GR15A3162	Sensors & Transducers	EEE
	GR15A3163	Automobile Engineering	ME
	GR15A3164	Human Computer Interaction	CSE
	GR15A3165	Essentials of Big Data Analytics	IT
	GR15A3166	Principles of Operating Systems	ECE
	Open Elective 3	**Course Title**	**Department Offering**
OE - III	GR15A4161	Green Building Technology	CE
	GR15A4162	Soft Computing Techniques	EEE
	GR15A4163	Operations Research	ME
	GR15A4164	Mobile Computing and Applications	CSE
	GR15A4165	Business Intelligence	IT
	GR15A4166	Principles Of Satellite Communications	ECE

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

DESIGN AND ANALYSIS OF ALGORITHMS

Course Code: GR15A3056   **L T P C**

III Year I Semester   **3 1 0 4**

UNIT I

Introduction: Definition of an algorithm, properties of an Algorithm, performanceanalysis—space complexity & time complexity, asymptotic notations: big oh notation, omega notation, theta notation, little oh notation & little omega notation. **Disjoint sets:** disjoint set Representation, Operations, union and findalgorithms.

UNIT II

Divide and conquer: General method, applications, binary search, quick sort,merge sort, strassen's matrix multiplication. Time complexities of divide and conquer algorithms.**, Dynamic programming-1:** General method, applications, matrix chain multiplication, optimal binary search trees, 0/1 knapsack problem

UNIT III

Dynamic programming -II: All pairs shortest path problem, travelling salesperson problem, reliability design.**, Greedy method:** General method, applications— job sequencing with deadlines, 0/1 knapsack problem, minimum cost spanning trees, single source shortest path problem.

UNIT IV

Backtracking: General method, applications, n-queen problem, sum of subsetsproblem, graph coloring, Hamiltonian cycles.

UNIT V

Branch and Bound: General method, applications, travelling sales personproblem, /1 knapsack problem: LC branch and bound solution, FIFO branch and bound solution**, NP-hard and NP-complete problems:** Basic concepts, non deterministic algorithms, deterministic algorithms, Introduction to P class problems, NP class problems.

TEXT BOOKS

1.   Ellis Horowitz, SatrajSahni and S Rajasekharam, Fundamentals of Computer Algorithms, Galgotia publishers

2.   T H Cormen, C E Leiserson, and R L Rivest, Introduction to Algorithms, 3rdEdn, Pearson Education

REFERENCES

1.   R C T Lee, Hang and TT Sai, Introduction to Design and Analysis of Algorithms, A strategic approach, TMH

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

WEB TECHNOLOGIES

Course Code: GR15A3059	L T P C
III Year I Semester	**3 1 0 4**

UNIT I

HTML Common tags- List, Tables, images, forms, Frames, Cascading Style sheets,

Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

UNIT II

XML: Document type definition, XML Schemas, Document Object model,Presenting XML, Using XML Processors (DOM and SAX).

Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDKIntrospection, Using Bound properties, Bean Info Interface, Constrained properties, Persistence, Customizes, Java Beans API, Introduction to EJB's

UNIT III

Web Servers and Servlets: Tomcat web server, Introduction to Servlets,Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servlet Package, Reading Servlet parameters, Reading Initialization parameters, Thejavax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

UNIT IV

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

JSP Application Development: Generating Dynamic Content, Using ScriptingElements Implicit JSP Objects, Conditional Processing –

Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages, Sharing Session and Application Data, Memory Usage Considerations

UNIT V

Database Access : Database Programming using JDBC, Studying Javax.sql.*package,Accessing a Database from a JSP Page, Application – SpecificDatabase Actions,Deploying JAVA Beans in a JSP Page, Introduction to struts framework..

TEXT BOOKS

1.   Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNIT s 1,2 ,3)

2.   The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH (Chapters: 25) (UNIT 4)

3.   Java Server Pages –Hans Bergsten, SPD O'Reilly (UNITs 5,6,7,8)

REFERENCES

1.   Programming world wide web-Sebesta,Pearson

2.   Core SERVLETS ANDJAVASERVER PAGES VOLUME

1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson

3.   Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.

4.   Jakarta Struts Cookbook , Bill Siggelkow, S P D O'Reilly for chap 8.

5.   Murach's beginning JAVA JDK 5, Murach, SPD

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

7.   Web Applications Technologies Concepts-Knuckles,John Wiley

8.   Programming world wide web-Sebesta,Pearson

9.   Web Warrior Guide to WebProgrammming-Bai/Ekedaw-Thomas

10. Beginning Web Programming-Jon Duckett WROX.

11. Java Server Pages, Pekowsky, Pearson.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
MICROCONTROLLERS

Course Code: GR15A2055　　　　　　　　**L T P C**
III Year I Semester　　　　　　　　　　　**3 1 0 4**

UNIT I

Introduction and 8086 Architecture: Introduction to microprocessors, 8086Architecture: Functional diagram, Register organization, Memory segmentation, Programming model, Memory address, Physical memory organization, Signal description of 8086, Timing diagrams, Interrupts of 8086.

UNIT II

Introduction and 8051 Architecture: Introduction tomicro controllers, comparing microprocessors and microcontrollers, 4,8,16 and 32 bit microcontrollers, DevelopmentsystemsforMicrocontrollers, Architecture; Architecture of 8051, pin configuration of 8051microcontroller, hardware input pins, output pins ports and external memory, counters and timers, serial data input /output and interrupts.

UNIT III

Moving Data and Logical Operations: Introduction, Addressing modes, External Datamoves, CodeMemoryRead-only Data Moves, PUSH and POPO pcodes, Data Exchanges, Logical Operations; Introduction, Byte-Level Logical Operations, Bit-Level Logical Operations, Rotate and Swap Operations.

UNIT IV

Arithmetic Operations, Jump and Call Opcodes: Introduction, Flags, Incrementingand Decrementing, Addition, Subtraction,

Multiplication and Division, Decimal Arithmetic, Jumpand Callopcodes; introduction, Thejumpandcall program range, Jumps, Calls and Subroutines, call and returns, Interrupts and Returns

UNIT V

8051 MicrocontrollerDesign: Introduction, Microcontroller specification, Microcontroller Design, Testingthe Design, Timings ubroutines, Serial Data Transmission.

Applications and Serial Data Communication: Keyboards, Displays, Pulse Measurement, D/Aand A/DConversions, Multiple interrupts, Serial data Communication;

TEXT BOOKS

1. D.V.Hall, Microprocssors and Interfacing, TMH,2nd edition 2006.

2. Kenneth J. Ayala, The 8051 Micro controller Architecture Programming and Applications, 2nd Edition, Penram International Publishers (I), 1996.

REFERENCES

1. A.K.Ray and K.M. Bjurchandani, TMH, 2nd edition, Advanced Microprocessors and Peripherals TMH, 2006

2. Mohammed Ari Mazidi and Janci Gillispie, The 8051 Microcontroller and Embedded Systems, Pearson Education Asia, New Delhi, 2003.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
SOFTWARE ENGINEERING
(Professional Elective – I)

Course Code: GR15A3057   **L T P C**

III Year I Semester   **3 1 0 4**

UNIT I

Introduction to Software Engineering: The evolving role of software,Changing Nature of Software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

Process models : The waterfall model, Incremental process models, Evolutionary process models, The Unified process.

UNIT II

Software Requirements: Functional and non-functional requirements, Userrequirements, System requirements, Interface specification, the software requirements document.

Requirements engineering process: Feasibility studies, Requirementselicitation and analysis, Requirements validation, Requirements management.

UNIT III

Design Engineering: Design process and Design quality, Design concepts, thedesign model.

Creating an architectural design: Software architecture, Data design,Architectural styles and patterns, Architectural Design.

Performing User interface design: Golden rules, User interface analysis anddesign, interface analysis, interface design steps, Design evaluation.

UNIT IV

Testing Strategies: A strategic approach to software testing, test strategies forconventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Product metrics: Software Quality, Metrics for Analysis Model, Metrics forDesign Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

UNIT V

Metrics for Process and Products: Software Measurement, Metrics forsoftware quality.

Risk management: Reactive vs. Proactive Risk strategies, software risks, Riskidentification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Quality Management : Quality concepts, Software quality assurance, SoftwareReviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

TEXT BOOKS

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition.McGrawHill International Edition.

2. Software Engineering- Sommerville, 7th edition, Pearson education.

REFERENCES

1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers

2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.

3. Systems Analysis and Design- Shely Cashman Rosenblatt,Thomson Publications.

4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
COMPUTER GRAPHICS
(Professional Elective – I)

Course Code: GR15A3069   **L T P C**

III Year ISemester   **3 1 0 4**

UNIT I

Introduction, Application areas of Computer Graphics, overview of graphicssystems, video- display devices, raster- scan systems, random scan systems, graphics monitors and work stations and input devices.

Output primitives: Points and lines, linedrawing algorithms, mid-pointcircleandellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fillandflood-fillalgorithms

UNIT II

2-D geometrical transforms: Translation, scaling, rotation, reflection and sheartransformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

2-D viewing: The viewing pipeline, viewing coordinate reference frame, windowto view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm

UNIT III

3Dgeometrictrans formations: Translation, rotation, scaling, reflection andshear transformations, composite transformations.

3-Dviewing: Viewingpipeline, viewing coordinates, view volume and general projection transforms and clipping.

3-D object representation: Polygon surfaces, quadric surfaces, splinere presentation, Hermite curve, Bezier curve and B-Spline curves, Bezier

and B-Spline surfaces. Basic illumination models, polygon rendering methods.

UNIT IV

Visible surface detection methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP- tree methods, area sub-division and octree methods.

UNIT V

Computer animation: Design of animation sequence, general computeranimationfunctions,rasteranimation,computeranimationlanguages,keyframe systems, motion specifications.

TEXT BOOKS

1.　　"Computer Graphics Cversion", Donald Hearnand M. Pauline Baker, Pearson Education.

2.　　"Computer Graphics Principles & practice", secondeditioninC, Foley, VanDam, Feiner and Hughes, Pearson Education.

REFERENCES

1.　　"Computer Graphics", second Edition, Donald HearnandM. Pauline Baker, PHI/Pearson Education.

2.　　"Computer Graphics Secondedition", Zhigandxiang, RoyPlastock, Schaum's outlines, TataMc-Grawhilledition.

3.　　Procedur alelements for Computer Graphics, David FRogers,T ataMcGraw hill, 2ndedition.

4.　　"Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.5. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.

5.　　Computer Graphics, Steven Harrington,TMH

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
PRINCIPLES OF PROGRAMMING LANGUAGE
(Professional Elective – I)

Course Code: GR15A3053   **L   T   P   C**

III Year I Semester   **3   1   0   4**

UNIT I

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, Influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, Functional Programming , Logic Programming.

Programming Language Implementation: Compilation and Virtual Machines, programming environments.

UNIT II

Syntax and Semantics: General Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features.

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

UNIT III

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation, mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter

passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions, user defined overloaded operators,coroutines.

UNIT IV

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada95.**Concurrency:** Subprogram level concurrency, semaphores, monitors, message passing, Java threads, C# threads.

Exception handling: Exceptions, Exception propagation, Exception handler in Ada, C++ and Java.

Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

UNIT V

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative languages.

TEXT BOOKS

1. Concepts of Programming Languages Robert .W. Sebesta 6/e, Pearson Education.

2. Programming Languages –Louden, Second Edition, Thomson.

REFERENCES

1. Programming languages –Ghezzi, 3/e, John Wiley

2. Programming Languages Design and Implementation – Pratt and Zelkowitz, Fourth Edition PHI/Pearson Education

3. Programming languages –Watt, Wiley Dreamtech

4. LISP Patric Henry Winston and Paul Horn Pearson Education.

5. Programming in PROLOG Clocksin, Springer

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
WEB TECHNOLOGIES LAB

Course Code:GR15A3063   **L T P C**
III Year I Semester   **0 0 2 2**

1.   XML editor like Altova Xml-spy [www.Altova.com / XML Spy free] , Stylusstudio , etc.,

2.   A database either Mysql or Oracle

3.   JVM(Java virtual machine) must be installed on your system

4.   BDK(Bean development kit) must be also be installed

5.   Apache Tomcat sever

Task -1

Design the following static web pages required for an online book store web site.

Home Page: The static home page must contain three frames.

Top frame : Logo and the college name and links to Home page, Loginpage, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

Left frame: At least four links for navigation, which will display thecatalogue of respective links.

For e.g.: When you click the link "CSE" the catalogue for CSE Books should be displayed in the Right frame.

Right frame: The pages to the links in the left frame must be loadedhere. Initially this page contains description of the web site.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Description of the Web Site			

Fig 1.1

2) LOGIN PAGE:
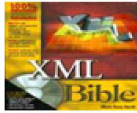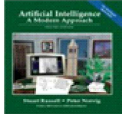
This page looks like below:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart

CSE

ECE   User Name : [_____]

EEE   Password : [_____]

CIVIL

           [Submit]   [Reset]

3) CATOLOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in a table.

The details should contain the following:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.

30

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE CEE EEC CIVIL		Book : XML Bible Author : Winston Publication :Wiely	$ 40.5	
		Book : AI		
		Author : S.Russel Publication : Princeton hall	$ 63	
		Book : Java 2 Author : Watson Publication : BPB publications	$ 35.5	
		Book:HTM in 24 hours Author : Sam Peter Publication : Sam publication	$ 50	

Note: Week 2 contains the remaining pages and their description.

Task -2:

4) CART PAGE:

The cart page contains the details about the books which are added to the cart.

The cart page should look like this:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE	**Book name**	**Price**	**Quantity**	**Amount**
ECE	Java 2	$35.5	2	$70
EEE	XML bible	$40.5	1	$40.5
CIVIL		**Total amount -**		$130.5

5) REGISTRATION PAGE:
Create a "*registration form* "with the following fields

        1) Name (Text field)
        2) Password (password field)
        3) E-mail id (text field)
        4) Phone number (text field)
        5) Sex (radio button)
        6) Date of birth (3 select boxes)
        7) Languages known (check boxes – English, Telugu, Hindi,

Tamil)

        8) Address (text area)

Task 3:

VALIDATION:

Write *JavaScript* to validate the following fields of the above registration page.

    1. Name (Name should contains alphabets and the length should not be less than 6 characters).

2. Password (Password should not be less than 6 characters length).

3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)

4. Phone number (Phone number should contain 10 digits only).

Note : You can also validate the login page with these parameters.

Task 4:

Design a web page using **CSS (C**ascading **S**tyle **S**heets**)** which includes the following:

1) Use different font, styles:

In the style definition you define how each selector should work (font, color etc.).

Then, in the body of your pages, you refer to these selectors to activate the styles.

```
For example:
<HTML>
<HEAD>
<style type="text/css">
B.headline {color:red; font-size:22px; font-family:arial; text-
decoration:underline}
</style>
</HEAD>
<BODY>
<b>This is normal bold</b><br> Selector {cursor:value}
For example:
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>
<body>
<
```

2) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:

BODY {background-image:url(myimage.gif);}

3) Control the repetition of the image with the background-repeat property. As background-repeat: repeat Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.

4) **Define styles for links as**

A:link

A:visited

A:active

A:hover

Example:

<style type="text/css"> A:link {text-decoration: none}

A:visited {text-decoration: none} A:active {text-decoration: none}

A:hover {text-decoration: underline; color: red;} </style>

5.   Work with layers: For example:

LAYER 1 ON TOP:

<div style="position:relative; font-size:50px; z-index:2;"> LAYER 1</div>

<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-index:1">LAYER 2</div>

LAYER 2 ON TOP:

<div style="position:relative; font-size:50px; z-index:3;"> LAYER 1</div>

<div style="position:relative; top:-50; left:5; color:red; font size:80px; z-index:4">LAYER 2</div>

6)   Add a customized cursor:

Selector {cursor:value}

 For example:

<html>

<head>

<style type="text/css">

.xlink {cursor:crosshair}.

hlink{cursor:help}

</style>

</head>

<body>CROSS LINK

HELP LINK

</body>

</html>

Task-5

Write an XML file which will display the Book information which includes the following:

1. Title of the book

2. Author Name

3. ISBN number

4. Publisher name

5. Edition

6. Price

Write a Document Type Definition (DTD) to validate the above XML file. Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically.Hint: You can use some xml editors like XML-spy

Task- 6

Visual Beans

Create a simple visual bean with a area filled with a color.

The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false.

The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the "property window ".

Task-7

1. Install TOMCAT web server and APACHE. While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port.

2. Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root. Access the pages by using the urls http://localhost:4040/rama/books.html (for tomcat) http://localhost:8080/books.html (for Apache)

Task-8

User Authentication:

Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a servlet for doing the following.

1. Create a Cookie and add these four user id's and passwords to this Cookie.

2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the cookies.

    If he is a valid user(i.e., user-name and password match) you should welcome him by name(user-name) else you should display " You are not an authenticated user ".

    Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

Task-9

Install a database(Mysql or Oracle).Create a table which should contain at least the following fields: name, password, email-id, phone number(these should hold the data from the registration form).Practice 'JDBC' connectivity.

Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

Task-10

Write a JSP which does the following job:

Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database (similar to week8 instead of cookies).

Task-11

Create tables in the database which contain the details of items (books in our case like Book name, Price, Quantity, Amount) of each category. Modify your catalogue page (week 2)in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

Task-12

HTTP is a stateless protocol. Session is required to maintain the state. The user may add some items to cart from the catalog page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time(i.e., from different systems in the LAN using the ip-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated (by using the method session.invalidate()).

Modify your catalogue and cart JSP pages to achieve the above mentioned functionality using sessions.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Course Code:GR15A3100   **L T P C**
III Year I Semester   **0 0 2 2**
UNIT-I

Functional English: Starting a conversation, responding appropriately andrelevantly. Body Language, Role play in different situations

UNIT-II

Vocabulary: Synonyms & Antonyms, Word Roots, One word substitutes,Prefixes & Suffixes, Study of word origin, Idioms and Phrases, Analogy.

UNIT- III

Group Discussion: Introduction to Group Discussion its features and qualitiesdesired in a participant of Group Discussion.

UNIT-IV

Presentation Skills: Knowing audience; acquiring content; organizing ideas;foreseeing the possible clarifications sought; adopting of appropriate medium; positive stage presence; Presenting and feedback

UNIT-V

Letter Writing & Résumé Writing: Manual and Emailing; types and formats;content and body of the letter. Email etiquettes; Resume Writing, tools required for writing resume's, role of cover letter in a resume.

UNIT-VI

Interview Skills: Introduction, various types of questions asked in an interview,qualities required to be a competent interviewee.

UNIT-VII

Reading comprehension: Introduction, types of reading, qualities of a goodreader

UNIT-VIII

Technical Report Writing

Formats and types of reports\

REFERENCES

1. English language laboratories: A Comprehensive Manual; NiraKonar, PHI Learning Pvt.Ltd.,Delhi.

2. Effective Technical Communication: A Guide for Scientist and Engineers;Barun K. Mitra, OUP.

3. Great Answers to Though Interview Questions; Martin John Yate; Seventh Edition;Kogan Page.

4. Business Communication; HorySankarMukerjee;OUP.

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

6. Professional Presentations; Malcom Goodale; Cambridge University Press.

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

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

9. Communication Skills, Sanjay Kumar, PushpLatha, Oxford Higher Education.

10. Business communication; Second Edition,Prentice Hall of India , New Delhi.

11. English for Engineers Made Easy, AedaAbidi, Ritu Chaudhry, Cengage Learning.

12. Effective Business Communication ; Seventh Edition; Murphy, HertaA.,Herbert W. Hildebrandt, and Jane P.Thomas 2009,Tata Mc Graw-Hill Publishing Company Limited, New Delhi.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
MICRO CONTROLLERS LAB

Course Code:GR15A2059   **L T P C**

III Year I Semester   **0 0 2 2**

List of experiments on 2G kit

Task1. LED patterns

  a) Blinking LEDs,   b) Serial lights,

  c) Half on/Half off,   d) Alternate on/off

Task2. Switches & LEDs

  a)   Press switch to make corresponding LED on,

  b)   Press switch to make corresponding LED off

  c)   First switch press, last LED on,

  d)   First switch press, last LED off

Task3. LCD

  e)   Character &string display on LCD,

  f)   SW1-Display strring1 on first line ofLCD,

  g)   SW2-Display strring1 on first line of LCD, SW2

Task4. UART

  h)   Echo Program,

  i)   Take command from PC & glow corresponding LED,

  j)   Press Switch & display switch number on PC,

  k)   Display data received by UART on LCD

Task5. TRIAC

  l)   220V AC bulb switch on/off,

  m) 220 V AC fan speed control with fixed step size.

Task6. ADC

n) Raw ADC value display on LCE,

o) Raw ADC value display on Hyper Terminal,

p) Engineering unit conversion and display on LCD,

q) Engineering unit conversion and display on Hyper Terminal

r) Limit checking for temperature value and switching on fan using triac

s) Limit checking for ambient light value and switching on light using triac.

Task7. DAC

a) Fixed step incremented DAC, output seen on multi-meter,

b) DAC input value received from Hyper Terminal

c) DAC input value taken from switches

Task8. DC motor

d) DC motor control-CW, CCW and stop using switches,

e) DC motor control- CW, CCW and stop using commands received from Hyper Terminal

Task9. ZigBee

f) Receive data on Zig Bee from PC ZigBee dongle and display data on LEDs

g) Receive data on Zig Bee from PC ZigBee dongle and display data on LCD

h) Read ADC and transmit data using ZigBee d)Triac based control of fan and light using data received on ZigBee

Task10. RF 433MHz

a) Receive data on RF from another kit with RF transmitter. Connect PCs to both kits. Type in data in Hyper Terminal of Transmitter kit & see on Hyper Terminal of Receiver kit

b) Read switches on transmitter kit, send their status on RF to receiver kit and control motor using switch status

Task11. Bluetooth

a) Transfer data to PC using Bluelink,

b) Receive data from PC using BlueLink & display on LCD

c) Transfer data from mobile phone(using a J2ME app) and receive using Blue link and control motor operation

d) Transfer data from mobile phone(using a J2ME app) and receive using BlueLink and control electrical appliance operation

Task12. Ethernet

e) Transfer data to PC using WIZI05SR and display on Hyper Terminal,

f) Implement an embedded web server

Task13. RTC

g) Read and display RTC data on LCD,

h) Read and display RTC data on Hyper Terminal,

i) Set RTC using Hyper terminal and display data on Hyper Terminal,

j) Implement an Event Logger with Time Stamp display

Task14. SDcard

k) Transfer data to PC, store on SDcard and retrieve it back(block transfer)

l) Implement FAT file system on SDcard c) Implement data acquisition system and store data in a CSV file on SD card with time stamp

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
WATER RESOURCES ENGINEERING
(Open Elective-I)

Course Code: GR15A3151   L T P C
III Year. I Semester   2 1 0 3
UNIT I

Introduction to Engineering Hydrology and its applications:
Hydrologic Cycle, types and forms of precipitation, rainfall measurement, types of Rain gauges, computation of average rainfall over a basin, processing of rainfall data-adjustment of record-Rainfall Double Mass Curve. Runoff-Factors affecting Runoff over a Catchment- Empirical and Rational Formulae.

Abstraction from rainfall: Evaporation, factors effecting evaporation, Measurement of evaporation- Evapotranspiration- Penman and Blaney&Criddle Methods -Infiltration, factors affecting infiltration, measurement of infiltration, infiltration indices'.

UNIT II

Distribution of Runoff: Hydrograph Analysis Flood Hydrograph – Effective Rainfall - Base Flow- Base Flow Separation - Direct Runoff Hydrograph– Unit Hydrograph, definition and limitations of application of Unit hydrograph, Derivation of Unit Hydrograph from Direct Runoff Hydrograph and vice versa S- hydrograph, Synthetic Unit Hydrograph.

UNIT III

Ground water Occurrence: Types of aquifers, aquifer parameters,' porosity' Specific yield, permeability, transmissivity and storage coefficient, Darcy's law, radial flow to wells in confined and unconfined aquifers, Types of wells, Well Construction - Well Development.

UNIT IV

Necessity and importance of irrigation: Advantages and ill-effects of irrigation, Types of irrigation, Methods of application of irrigation water, Indian Agriculture soils, Methods of improving soil fertility-Crop

rotation, preparation land for irrigation, Standards of quality for irrigation water.

Soil-water-plant relationship: Vertical distribution of soil moisture, soil moisture constants, soil moisture tension, consumptive use, Duty and delta, factors Affecting duty- design discharge for a water course. The depth and frequency of Irrigation, Irrigation efficiencies-Water Logging.

UNITV

Classification of canals: Design of Irrigation canals by Kennedy's and Lacey's theories, balancing depth of cutting, IS standards for canal design canal lining.

Design discharge over a catchment: computation of design discharge– rational formula, SCS curve number method, flood frequency analysis introductory part only. Stream gauging-measurement and estimation of stream flow.

TEXT BOOKS

1. A text book of hydrology by P. Jaya Rami Reddy, laxmi publications pvt limited

2. Irrigation and water power engineering- B.C. Punmia, PandeB. B.Lal, Ashok kumarjain, Arunkumarjain- Laxmi publications 16th edition

REFERENCES

l. Elementary hydrology by V.P. Singh PHI publications

2. Irrigation and Water- Resources &Water Power by P'N 'Modi' StandardBook House.

3. Irrigation Water Management by D'K' Majundar' Printice Hall ofIndra.

4. Irrigation and Hydraulic structures by S'K'Grag'

5. Applied Hydrology by VenTe Chow' David R' MaidmentlarryW' Mays Tata MC. GrawHill'

6. Introduction to Hydrology by Warren Viessman' Jr' Garyl' Lewis'

7. Handbook of Hydrology by David R. Maidment (Editour-in-chief)- McGrow - Hill

GOKARAJURANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
SOLAR AND WIND ENERGY SYSTEMS
(Open Elective- I)

Course Code: GR15A3152   **L T P C**

III Year I Sem   **2 1 0 3**

UNIT I

Solar Energy Basics: The sun as a source of energy, The Earth Sun, Earth Radiation Spectrums,Extra-terrestrial and Terrestrial Radiations, Spectral Energy Distribution of Solar Radiation, Depletion of Solar Radiation, Solar Radiation Data, Measurement of Solar Radiation, Solar Time(Local Apparent Time), Solar Radiation Geometry, Solar Day Length, Empirical Equations for Estimating Solar Radiation Availability on Horizontal Surface For Cloudy skies, Hourly Global, Diffuse and Beam Radiation on Horizontal Surface Under Cloudless Skies, Solar Radiation on Inclined Plane Surface

UNIT II

Solar Thermal Systems: Solar Collectors, Solar Water Heater, Solar Passive Space-Heating andCooling Systems, Solar Ustrial Heating Systems, Solar Refrigeration and Air-Conditioning Systems, Solar Cookers, Solar Furnaces, Solar Green House, Solar Dryer, Solar Distillation(or Desalination of Water), Solar Thermo-Mechanical Systems.

UNIT III

Solar Photovoltaic Systems: Solar Cell Fundamentals, Solar Cell Characteristics, Solar CellClassification, Solar Cell, Module, Panel and

Array Construction, Maximizing The Solar PV Output and Load Matching, Maximizing Power point tracker(MPPT),Balance of System Components, Solar PV Systems, Solar PV Applications

UNIT IV

Wind Energy: Origin of Winds, Nature of Winds, Wind Turbine Siting, Major Applications of WindPower, Basics of Fluid Mechanics, Wind Turbine Aerodynamics.

UNIT V

Wind Energy Conversion Systems: Wind Energy Conversion Systems (WECS), Wind-DieselHybrid System, Effects of Wind Speed and Grid Condition (System Integration), Wind Energy Storage, Environmental Aspects.

TEXT BOOKS

1.   B.H.Khan, "Non- Conventional Energy Resources", 2nd edition, Tata McGraw-Hill, New Delhi

REFERENCES

1.   SP Sukhatme, Solar Energy - Principles of thermal collection and storage, 2nd edition, Tata McGraw-Hill, New Delhi

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
APPLIED THERMODYNAMICS
(Open Elective-I)

Course Code:GR15A3153   **L T P C**
III B. Tech I Semester   **2 1 0 3**

UNIT I

Steam Power Cycles: Carnot cycle, Rankine cycle, Modified Rankine - Schematic layouts, Thermodynamic Analysis, Concept of Mean Temperature of Heat addition, Methods to improve cycle performance – Regeneration &Reheating. Binary vapour cycle

Combustion: Fuels and combustion, basic chemistry, combustion equations, stochiometric air fuel ratio, volumetric and mass basis conversion, Flue gas analysis by Orsat apparatus.

UNIT II

Boilers : Classification – Working principles – with sketches including H.P. Boilers, L.P. Boilers and Modern H.P. Boilers – Mountings and Accessories – Working principles, Boiler horse power, equivalent of evaporation, efficiency and heat balance. Draught, classification – Height of chimney for given draught and discharge, condition for maximum discharge, efficiency of chimney – Artificial draught: induced, forced, balanced and steam jet draught,

UNIT III

Steam Nozzles: Function of a nozzle – applications - types, Flow through nozzles, thermodynamic analysis, assumptions -velocity of nozzle at exit-Ideal and actual expansion in nozzle, velocity coefficient, condition for maximum discharge, critical pressure ratio, criteria to decide nozzle shape: Super saturated flow, its effects, degree of super saturation and degree of under cooling - Wilson line.

Steam Condensers: Requirements of steam condensing plant – Classification of condensers – working Principle of different types – vacuum efficiency and condenser efficiency – air leakage, sources and its affects, Air pump- cooling water requirement. Cooling towers.

UNIT IV

Steam Turbines: Classification – Impulse turbine ,De-Laval Turbine its features; Mechanical details – Velocity diagram – effect of friction – power developed, axial thrust, blade or diagram efficiency – condition for maximum efficiency.-.

Reaction Turbine: Mechanical details – principle of operation, thermodynamic analysis of a stage.-Degree of reaction –velocity diagram – Parson's reaction turbine – condition for maximum efficiency.

Compounding: Methods to reduce rotor speed-Velocity compounding and pressure compounding, pressure velocity compounding, Velocity and Pressure variation along the flow – combined velocity diagram for a velocity compounded impulse turbine.

UNIT V

Gas Turbines: Simple gas turbine plant – Ideal cycle, essential components – actual cycle –methods for improvement of performance - regeneration, inter cooling and reheating –Closed and Semi-closed cycles – merits and demerits, Brief concepts about compressors, combustion chambers and turbines of Gas Turbine Plant.

Jet Propulsion: Principle of Operation –Classification of jet propulsive engines – Working Principles with Schematic diagrams and representation on T-S diagram - Thrust, Thrust Power and Propulsion Efficiency– Turbo jet engines – Needs and Demands met by Turbo jet – Schematic Diagram, Thermodynamic Cycle, Performance Evaluation Thrust Augmentation – Methods.

Rockets: Working Principle – Classification – Propellant Type – Thrust, Propulsive Efficiency – Specific Impulse – Solid and Liquid propellant Rocket Engines.

TEXT BOOKS

1. Thermal Engineering / R.K. Rajput / Lakshmi Publications

2. Thermal Engineering-P.L.Ballaney/ Khanna publishers

3. Thermal Engineering/R.S.Khurmi/JS Gupta/S.Chand.

REFERENCES

1. Thermodynamics and Heat Engines / R. Yadav / Central Book Depot

2. Gas Turbines and Propulsive Systems – P.Khajuria&S.P.Dubey - / Dhanpatrai

3. Gas Turbines / Cohen, Rogers and SaravanaMuttoo / Addison Wesley – Longman

4. Thermal Engineering-M.L.Marthur& Mehta/Jain bros

5. Gas Turbines – V.Ganesan /TMH

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

PRINCIPLES OF E-COMMERCE
(OPEN ELECTIVE I)

Course Code: GR15A3154   **L T P C**

III Year I Semester   **2 1 0 3**

UNIT I

INTRODUCTION TO E-COMMERCE

E-commerce, Difference between E-commerce and E-business, Purpose of E-Commerce, Eight Unique Features of E-commerce Technology, Web 2:0, Types of E-commerce, Growth of the Internet and the Web, Origins and Growth of E-commerce, Understanding E-commerce.

UNIT II

E-COMMERCE BUSINESS MODELS AND CONCEPTS

E-commerce Business Models, Business-to-Consumer (B2C) Business Models, Business-to-Business (B2B) Business Models, Business Models in Emerging E-commerce Areas.

UNIT III

BUILDING AN E-COM WEB SITE

Building an E-commerce Web Site, Choosing Software, Choosing the Hardware, E-commerce Site Tools.

UNIT IV

ONLINE SECURITY AND PAYMENT SYSTEMS

Security Threats in the E-commerce Environment, Technology Solutions, payment systems, E-commerce Payment System, Electronic Billing Presentment and Payment.

UNIT V

ONLINE CONTENT AND MEDIA

Online Content, Online Publishing Industry, Online Entertainment Industry.

TEXT BOOK

Kenneth C. Laudon Carol GuercioTraver, "E-commerce: business, technology, society", Fifth edition, Pearson Prentice Hall, 2009. (Unit-1:Chapter -1, Unit-II: Chapter-2, Unit-III: Chapter-4, Unit-IV: Chapter-5, Unit-V:Chapter-10)

REFERENCES

1. Dave Chaffey, "E-Business and E-Commerce Management: Strategy, Implementation and Practice", Fifth edition, Pearson Education, 2013.

2. K.K. Bajaj, Debjani Nag, "E-Commerce: The Cutting Edge of Business", Second edition, McGraw Hill Education (India) Private Limited, 2005.

3. David Whiteley ,"E-Commerce: Strategy, Technologies And Applications", McGraw Hill Education (India) Private Limited, 2001.

4. SteffanoKorper, "The E-Commerce Book: Building the E-Empire", Morgan Kaufmann, 2000.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

DATA MINING AND APPLICATIONS

(Open Elective – I)

Course Code: GR15A3155	**L**	**T**	**P**	**C**
III Year I Semester	**2**	**1**	**0**	**3**

UNIT I

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Major issues in Data Mining. Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT II

Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint- Based Association Mining

UNIT III

Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back propagation, Support Vector Machines, Associative Classification, Prediction, Accuracy and Error measures, Evaluating the accuracy of a Classifier or a Predictor.

Cluster Analysis Introduction :Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Outlier Analysis - Distance-Based Outlier Detection, Density-Based Local Outlier Detection

UNIT IV

Mining World Wide Web: Mining web page layout structure, Identification of authoritative web pages using web link structures, Automatic Classification of Web Documents, Web Usage Mining.

Spatial Mining: Mining spatial association and colocation patterns, spatial clustering methods, spatial classification and spatial trend analysis.

UNIT V

Text Mining: Text Data analysis and Information retrieval, Dimensionality reduction for text, text mining approaches.

Applications and trends in Data Mining : Data Mining for Financial Data Analysis, , Data Mining for Telecommunication Industry, Data Mining for Intrusion Detection, Various themes on Data Mining, Social impacts of data mining

TEXT BOOKS

1. Data Mining – Concepts and Techniques - Jiawei Han and Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, Second Edition, 2006.

2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education.

3. Data Mining – Introductory and advanced topics – Margaret H. Dunham &S.Sridhar, Pearson Education.

REFERENCES

1. Data Mining Techniques – Arun K. Pujari, Second Edition, Universities Press.

2. Data Warehousing in the Real World, Sam Anahory and Dennis Murray, Pearson Edn Asia.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPUTER ARCHITECTURE AND

ORGANIZATION   **(Open Elective-1)**

Course Code: GR15A3156   **L T P C**

III Year I Semester   **2 1 0 3**

UNIT I

Introduction

Computing and Computers, Evolution of Computers, VLSI Era, System Design; Register Level, Processor Level, CPU Organization, Data Representation, Fixed Point Numbers, Floating Point Numbers, Instruction Formats, Instruction Types, addressing modes.

UNIT II

Data Path Design

Fixed Point Arithmetic, Addition, Subtraction, Multiplication and Division, Combinational and Sequential ALUs, Carry look ahead adder, Robertson algorithm, booth's algorithm, non-restoring division algorithm,Floating Point Arithmetic,

Coprocessor, Pipeline Processing, Pipeline design, Modified booth's Algorithm

UNIT III

Control Design

Hardwired Control, Microprogrammed Control, Multiplier Control Unit, CPU Control Unit, Pipeline Control Instruction Pipelines, Pipeline Performance, Superscalar Processing, Nano Programming.

UNIT IV

Memory Organization

Random Access Memories, Serial Access Memories, RAM Interfaces, Magnetic Surface Recording, Optical Memories, multilevel memories, Cache & Virtual Memory, Memory Allocation, Associative Memory.

UNIT V

System Organization

Communication methods, Buses, Bus Control, Bus Interfacing, Bus arbitration, IO and system control, IOinterface circuits, Handshaking, DMA and interrupts, vectored interrupts, PCI interrupts, pipelineinterrupts, IOP organization, operation systems, multiprocessors, fault tolera-nce, RISC and CISC processors, Superscalar and vector processor.

TEXT BOOKS:

1. John P.Hayes, 'Computer architecture and Organisation', TMH Third edition, 1998.

2. V. Carl Hamacher, Zvonko G. Varanesic and Safat G. Zaky, "Computer Organisation", V edition, McGraw-Hill Inc, 1996.

REFERENCES:

1. Morris Mano, "Computer System Architecture", Prentice-Hall of India, 2000.

2. Paraami, "Computer Architecture", BEH R002, Oxford Press.

3. P.Pal Chaudhuri, "Computer organization and design", 2nd Ed., Prentice Hall of India, 2007.

4. G. Kane & J.Heinrich, "MIPS RISC Architecture", Englewood cliffs, New Jersey, Prentice Hall, 1992.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
ADVANCED LINUX PROGRAMMING

Course Code: GR15A3103   **L T P C**

III Year II Semester   **3 1 0 4**

UNIT I

Utilities-Introduction to Linux file system, vi editor, file handling utilities, securityby file permissions, process utilities, disk utilities, networking commands, cp, mv, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w, finger, ftp, telnet, text processing utilities and backup utilities, detailed commands to be covered are cat, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, comm, cmp, diff, tr, tar.

Working with the Bourne shell: what is a shell, shell responsibilities, pipes andinput Redirection, output redirection, here documents, shell meta characters, shell variables, shell commands, the environment, control structures, shell script examples.

UNIT II

Files System: Linux file structure, directories, files and devices, System calls,library functions, low level file access, usage of open, creat, read, write, close, lseek, stat, fstat, umask, dup, dup2. The standard I/O (fopen, fclose, fflush, fseek, fgetc, getc, fputc, putc, fgets, gets), formatted I/O, streams and file descriptors, file and directory maintenance (chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd), Directory handling system calls (opendir, readdir, closedir,rewinddir, seekdir, telldir)

UNIT-III

LINUX Process and Signals: What is process, process structure, starting newprocess, waiting for a process, zombie process, process control,

process identifiers, system call interface for process management-fork, vfork, exit, wait, waitpid, exec, system, Signals- Signal functions, unreliable signals, interrupted system calls, kill and raise functions, alarm, pause functions, abort, sleep functions.

UNIT-IV

Interprocess Communication Overview: Introduction to IPC,IPC betweenprocesses on a single computer system, IPC between processes on different systems, file and record locking, other LINUX locking techniques, pipes, FIFOs, streams and messages, namespaces, introduction to three types of IPC(system-V)-message queues, semaphores and shared memory.

UNIT-V

Message Queues-LINUX system: V messages, LINUX kernel support formessages, LINUX APIs for messages, client/server example. Semaphores- LINUX system-V semaphores, LINUX kernel support for semaphores, LINUX APIs for semaphores, file locking with semaphores. Shared Memory- LINUX system-V shared memory, LINUX kernel support for shared memory, LINUX APIs for shared memory, semaphore and shared memory example.

TEXT BOOKS

1. Unix the ultimate guide, Sumitabha Das, TMH

2. Unix Network Programming, W.R.Stevens, Pearson/PHI

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
AUTOMATA AND COMPILER DESIGN

Course Code: GR15A3064   **L T P C**
III Year II Semester   **3 1 0 4**

UNIT I

Introduction: Alphabets, Strings and Languages; Automata and Grammars,Deterministic Finite Automata (DFA)-Formal Definition, Simplified notation: State transition graph, Transition table, Language of DFA, Nondeterministic Finite Automata (NFA), Equivalence of NFA and DFA, Minimization of Finite Automata, Regular Expressions, Arden's theorem.

UNIT II

Compiler Structure: Compilers and Translators, Various Phases of Compiler,Pass Structure of Compiler, Bootstrapping of Compiler. Lexical Analysis: The role of Lexical Analyser, A simple approach to the design of Lexical Analyser, Implementation of Lexical Analyser. The Syntactic Specification of Programming Languages: CFG, Derivation and Parse tree, Ambiguity, Capabilities of CFG. Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive Descent Parsers, Predictive Parsers.

UNIT III

Bottom–up Parsers: Shift-Reduce Parsing, Operator Precedence Parsers,LRparsers (SLR, Canonical LR, LALR) Syntax Analyser Generator: YACC, **Intermediate Code Generation:** Different Intermediate forms: three addresscode, Quadruples & Triples. Syntax Directed translation mechanism and attributed definition. Translation of Declaration, Assignment, Control Flow, Boolean expression, Array References in arithmetic expressions, procedure calls, case statements, postfix translation

UNIT IV

Run Time Memory Management: Static and Dynamic storage allocation, stackbased memory allocation schemes, Symbol Table management, Error Detection and Recovery: Lexical phase errors,Syntactic phase errors, Semantic errors

UNIT V

Code Optimization and Code Generation: Local optimization, Loopoptimization, Peephole optimization, Basic blocks and flow graphs, DAG, Data flow analyser, Machine Model, Order of evaluation, Register allocation and code selection.

TEXT BOOKS

1. Introduction to Theory of Computation.Sipser, 2nd Edition, Thomson.
2. Hopcroft, Ullman, "Introduction to Automata Theory, Languages and Computation", Pearson Education
3. Compilers Principles, Techniques and Tools Aho, Ullman, Sethi, Pearson Education

REFERENCES

1. Modern Compiler Construction in C , Andrew W.Appel Cambridge University Press.
2. Compiler Construction, LOUDEN, Thomson.
3. Elements of Compiler Design, A. Meduna, Auerbach Publications, Taylor and Francis Group.
4. Principles of Compiler Design, V. Raghavan, TMH.
5. Engineering a Compiler, K. D. Cooper, L. Torczon, ELSEVIER.
6. Introduction to Formal Languages and Automata Theory and Computation - Kamala Krithivasan and Rama R, Pearson.
7. Modern Compiler Design, D. Grune and others, Wiley-India.
8. A Text book on Automata Theory, S. F. B. Nasir, P. K. Srimani, Cambridge Univ. Press.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
OBJECT ORIENTED ANALYSIS AND DESIGN

Course Code: GR15A3065   **L T P C**
III Year II Semester   **3 1 0 4**

UNIT I

Introduction to UML: Importance of modeling, Principles of modeling, Objectoriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle. Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

UNIT II

Advanced Structural Modeling: Advanced classes, advanced relationships,Interfaces, Types and Roles, Packages.

Class & Object Diagrams: Terms, concepts, Modeling Techniques for Class & Object Diagrams.

UNIT III

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.

Basic Behavioral Modeling-II: Use cases, Use case Diagrams, ActivityDiagrams.

UNIT IV

Advanced Behavioral Modeling: Events and signals, State machines,processes and Threads, time and space, State chart diagrams.

UNIT V

Architectural Modeling: Component, Deployment, Component diagrams andDeployment diagrams.

Case Study: The Unified Library application

TEXT BOOKS

1. The Unified Modeling Language User Guide, Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.

2. UML 2 Toolkit, Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, WILEY-Dreamtech India Pvt. Ltd.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
INFORMATION SECURITY
(Professional Elective – II)

Course Code: GR15A3058   **L T P C**
III Year IISemester   **3 1 0 4**

UNIT I

Security Attacks(Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security.

Conventional Encryption Principles, Conventional encryption algorithms(DES,Blowfish,Idea), cipher block modes of operation, location of encryption devices, key distribution, Approaches of Message Authentication, Secure Hash Functions(MD-5,SHA-1) and HMAC.

UNIT II

Public key cryptography principles, public key cryptography algorithms (RSA, Deffie-Hellman), digital signatures, digital Certificates, Certificate Authority and key management, Kerberos, X.509 Directory Authentication Service.

UNIT III

Email privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT IV

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management, Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT V

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3.

Intruders, Viruses and related threats,Firewall Design principles, Trusted System, Intrusion Detection Systems.

TEXT BOOKS

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.

2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain ForestPuppy, Joe Grand, David Ahmad, Hal Flynn IdoDubrawsky, Steve W.Manzuik and Ryan Permeh, wileyDreamtech

REFERENCES

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)

2. Network Security - Private Communication in a Public World by CharlieKaufman, Radia Perlman and Mike Speciner, Pearson/PHI.

3. Cryptography and network Security, Third edition, Stallings, PHI/ Pearson

4. Principles of Information Security, Whitman, Thomson.

5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH

6. Introduction to Cryptography, Buchmann, Springer.

EMBEDDED SYSTEMS
(Professional Elective – II)

Course Code: GR15A3070   **L T P C**
III Year II Semester   **3 1 0 4**

UNIT I

Introduction to Embedded Systems: Embedded Systems, Processor
Embedded to a system, Embedded hardware units and devices in a
system, Embedded software in a system, Examples of Embedded systems,
Soc(System on chip) and use of VLSI circuit design technology, complex
system design and processors, Design process in Embedded system,
formalization of system design, design process and design examples,
classification of embedded systems, skills required for embed system
design.

UNIT II

Devices and Buses for Devices Network: I/O Devices:- Types and
Examples of I/O devices, Synchronous, Iso-synchronous and
Asynchronous Communications from Serial Devices - Examples of
Internal Serial-Communication Devices:- SPI, UART, Parallel Port
Devices - Timer and Counting Devices – Serial Communication using:
'I2C', 'USB', 'CAN'- Advanced I/O Serial high speed buses: ISA, PCI,
PCI- X, cPCI and advanced buses.

UNIT III

Programming Concepts and Embedded Programming in C, C++ :

Programming in assembly language (ALP) vs High Level Language - C
Program Elements:- Macros and functions, Use of Date Types, Structure,
Pointers, Function Calls - Concepts of Embedded Programming in C++:-

Objected Oriented Programming, Embedded Programming in C++, 'C' Program compilers– Cross compiler – Optimization of memory needs.

UNIT IV

Real Time Operating Systems: Definitions of process, tasks and threads – InterProcess Communication:- Shared data problem, Use of Semaphore(s), Priority Inversion Problem and Deadlock Situations, Message Queues, Mailboxes, Pipes, Virtual (Logical) Sockets, Remote Procedure Calls (RPCs) - Operating System Services:- Goals, Structures, Kernel, Process Management, Memory Management, Device Management - Real Time Operating System - RTOS Task scheduling models:- Co-operative Round Robin Scheduling, Cyclic Scheduling with Time Slicing.

UNIT V

System Design Techniques: Design Methodologies, Requirement Analysis, Specification, System Analysis and Architecture Design. Design Examples:-Telephone PBX- System Architecture, Ink jet printer - Hardware Design and Software Design, Personal Digital Assistants, Set-top Boxes.

TEXT BOOKS

1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill, First reprint Oct. 2003

2. Computers as Components-principles of embedded computer system design, Wayne Wolf, Elseveir.

3. The 8051 Microcontroller, Third Edition, Kenneth J.Ayala, Thomson.

REFERENCES

1. Steve Heath, Embedded Systems Design, Second Edition-2003, Newnes,

2. David E.Simon, An Embedded Software Primer, Pearson Education Asia, First Indian Reprint 2000.

3. Frank Vahid and Tony Givargis, Embedded Systems Design – A unified Hardware /Software Introduction, John Wiley, 2002.

4. Embedding system building blocks, Labrosse, via CMP publishers.

5. Embedded Systems, Raj Kamal, TMH.

6. Micro Controllers, Ajay V Deshmukhi, TMH.

7. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.

8. Microcontrollers, Raj kamal, Pearson Education.

9. An Embedded Software Primer, David E. Simon, Pearson Education.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
DISTRIBUTED DATABASES AND SYSTEMS
(Professional Elective – II)

Course Code: GR15A3068   **L T P C**
III Year II Semester   **3 1 0 4**

UNIT I

Features of Distributed versus Centralized Databases, Principles of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Distributed Database Design.

Translation of Global Queries to Fragment Queries, Equivalence transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

UNIT II

The Management of Distributed Transactions, A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions

Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

UNITIII

Reliability, Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration.

UNIT IV

Introduction to Distributed Systems: The different forms of computing, monolithical, distributed, parallel and cooperative computing, the architecture of distributed applications.

Paradigms for distributed applications-massage passing paradigm, the client-server paradigm, the peer to peer paradigm, the message passing (MOM) paradigm- point to point message model and the publisher-subscriber message model, RPC model, The distributed Object Paradigms, choosing a paradigm for an application.

UNIT V

Distributed Object Space Paradigm (RMI): message passing versesdistributed objects, an archetypal distributed object architecture, distributed object system, RPC, RMI, the RMI java architecture, java RMI API, a simple RMI application, steps for building an RMI application, testing and debugging, comparison of RMI and socket API,Introduction to CORBA distributed architectures,

TEXT BOOKS

1. Distributed Databases Principles & Systems, Stefano Ceri, Giuseppe Pelagatti,TMH.

2. Distributed computing principles and applications, M LLiu, Pearson Edition.

3. Distributed computing principles and applications A.S Tanenbaum.

REFERENCES

1. Principles of Distributed Database Systems, M. Tamer Ozsu, Patrick Valduriez , Pearson Education, 2nd Edition.

2. Distributed Systems, Concepts and Design, 3rd Edition G.Colouris, J.Dollimore, Pearson .Education

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
ADVANCED LINUX PROGRAMMING LAB

Course Code:GR15A307   **L T P C**
III Year II Semester   **0 0 2 2**

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

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

3. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.

4. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.

5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files

6. Write a shell script to list all of the directory files in a directory.

7. Write a shell script to find factorial of a given integer.

8. Write an awk script to count the number of lines in a file that do not contain vowels.

9. Write an awk script to find the number of characters, words and lines in a file.

10. Write a C program that makes a copy of a file using standard I/O and system calls

11. Implement in C the following LINUX commands using System calls (A). cat

(B). Is (C). mv

12. Write a program that takes one or more file/directory names as command line input and reports the following information on the file. (A) File type. (B)Number of links. (C) Time of last access. (D) Read, Write and Execute permissions.

13. Write a C program to emulate the LINUX ls –l command.

14. Write a C program to list for every file in a directory, its inode number and file name.

15. Write a C program that demonstrates redirection of standard output to a file. Ex: ls > f1.

16. Write a C program to create a child process and allow the parent to display "parent" and the child to display "child" on the screen.

17. Write a C program to create a Zombie process.

18. Write a C program that illustrates how an orphan is created.

19. Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex: - ls –l | sort

20. Write C programs that illustrate communication between two unrelated processes using named pipe

21. Write a C program to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.

22. Write a C program that receives the messages (from the above message queue as specified in (21)) and displays them.

23. Write a C program to allow cooperating processes to lock a resource for exclusive use, using a) Semaphores b) flock or lockf system calls.

24. Write a C program that illustrates suspending and resuming processes using signals

25. Write a C program that implements a producer-consumer system with two processes. (Using Semaphores).

26. Write a C program that illustrates two processes communicating using shared memory

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
COMPILER DESIGN & UNIFIED MODELLING LANGUAGE LAB

Course Code: GR15A3071   **L T P C**

III Year II Semester   **0 0 2 2**

I.   UML diagrams to be developed are:

- Use Case diagram.

- Class diagram.

- Sequence diagram.

- Collaboration diagram.

- State diagram.

- Activity diagram

- Component Diagram

- Deployment Diagram.

II. Case Studies:

- ATM System.

- Library Management System

- Railway reservation system.

- Hospital Management System.

- School Management System

Compiler Design Lab

Task 1   **:**   Design a lexical analyzer for to kenizing an expression.

Task 2   **:**   Design a lexical analyzer to identify comment lines in a program.

Task 3   **:**   Implement brute force technique for a given grammar.

Task 4 : Implement RDP for a given grammar.

Task 5 : Find the first set of a given grammar.

Task 6 : Find the follow set of a given grammar.

Task 7 : Construct predictive parser for a given grammar.

Task 8 : Design shift-reduce parser for a given grammar.

Task 9 : Design operator precedence for a given grammar.

Task 10 : Design LALR parser for a given grammar.

Task 11 : Generate a three address code for a given expression.

Task 12 : Generate an optimized three address code for a given expression.

TEXT BOOKS

1. Principles of compiler design -A.V. Aho , J.D.Ullman, Pearson Education.

2. Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.

REFERENCES

1. Lex&Yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly

2. Modern Compiler Design- Dick Grune, Henry E. Bal, Cariel T. H. Jacobs, Wiley dreamtech.

3. Engineering a Compiler-Cooper & Linda, Elsevier.

4. Compiler Construction- Louden, Thomson

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
TRANSPORTATION ENGINEERING
(Open Elective – II)

Course Code: GR15A3161   **L T P C**
III Year   II Semester   **2 1 0 3**

UNIT I

Highway development and planning: Highway development in India – Necessity for Highway Planning- Different Road Development Plans- Classification of Roads- Road Network Patterns – Highway Alignment- Factors affecting Alignment- Engineering Surveys – Drawings and Reports.

UNIT II

Highway geometric design: Importance of Geometric Design- Design controls and Criteria- Highway Cross Section Elements- Sight Distances- Stopping sight Distance, Overtaking Sight Distance, intermediate Sight Distance and Head light sight distance- Design of Horizontal Alignment- Design of Super elevation and Extra widening- Design of Transition Curves-Design of Vertical alignment-Gradients- Vertical curves.

UNIT III

Traffic engineering: Traffic flow parameters-Volume, Speed, Density and headway- Traffic Volume Studies- Data Collection and Presentation- speed studies- Data Collection and Presentation- Parking Studies, Parking types and Parking characteristics- Road Accidents-Causes and Preventive measures- Accident Data Recording – Condition Diagram and Collision Diagrams.

Traffic regulation and management: Road Traffic Signs – Types and Specifications – Road markings-Need for Road Markings-Types of Road Markings- Design of Traffic Signals –Webster Method –IRC Method.

UNIT IV

Intersection design: Types of Intersections – Conflicts at Intersections-Types of At-Grade Intersections- Channelization: Objectives –Traffic Islands and Design criteria-Types of Grade Separated Intersections-Rotary Intersection – Concept of Rotary and Design Criteria- Advantages and Disadvantages of Rotary Intersection.

UNIT V

Introduction to railway and airport engineering: Gradients- Grade Compensation- Cant and Negative Super elevation- Cant Deficiency – Degree of Curve – Crossings and Turn outs.

Factors affecting Selection of site for Airport – Aircraft Characteristics-Geometric Design of Runway- Computation of Runway length – Correction for runway length – Orientation of Runway – Wind Rose Diagram – Runway Lighting system.

TEXT BOOKS:

1. Highway Engineering – S.K.Khanna&C.E.G.Justo, Nemchand& Bros., 9th edition (2011).

2. Railway Engineering – A text book of Transportation Engineering – S.P.Chandola – S.Chand& Co. Ltd. – (2001).

3. Highway Engineering Design – L.R.Kadiyali and Lal- Khanna Publications.

4. Airport Planning and Design- S.K.Khanna and Arora,Nemchand Bros.

REFERENCES:

1. Highway Engineering – S.P.Bindra ,DhanpatRai& Sons. – 4th Edition (1981)

2. Traffic Engineering & Transportation Planning – Dr.L.R.Kadyali, Khanna publications – 8th Edition – 2011.

3. Railway Engineering – S.C.Rangwala –Charotar Publishers.

4. Air Transportation Planning & design – S.K.Khanna – NemChnd and Bros.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
SENSORS AND TRANSDUCERS
(Open Elective – II)

Course Code: GR15A3162   **L T P C**

III Year II Sem   **2 1 0 3**

UNIT I

Introduction: Sensors / Transducers, principles, classification, parameters, characterizations

UNIT II

Introduction to mechanical & Electro Mechanical Sensors: Resistive Potentiometer, Inductive sensors, Capacitive Sensors, Ultrasonic Sensors

UNIT III

Basics of Thermal and Magnetic Sensors: Gas thermometric sensors, Thermal expansion type thermometric sensors, acoustic temperature sensors, dielectric constant and refractive index thermo sensors. Sensors and principles: Yoke coil sensor, coaxial type sensor, Force and displacement sensor

UNIT IV

SMART Sensors: Introduction, Primary sensors, Excitation, Amplification, Filters, Converters, Compensation, Information coding / processing, Data Communication, The Automation

UNIT V

SMART Sensors: Introduction, Primary sensors, Excitation, Amplification, Filters, Converters, Compensation, Information coding / processing, Data Communication The Automation

TEXT BOOK:

1.Sensors& Transducers By D. Patranabis , PHI Publications

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
AUTOMOBILE ENGINEERING
(Open Elective-II)

Course code:GR15A3163   **L T P C**

III B. Tech II Semester   **2 1 0 3**

UNIT I

INTRODUCTION, ENGINE AND LUBRICATION SYSTEM

Components of four wheeler automobile – chassis and body – power unit –power transmission – rear wheel drive, front wheel drive, 4 wheel drive – types of automobile engines, Engine construction, turbo charging and super charging, Engine lubrication, splash and pressure lubrication systems, oil filters, oil pumps – crank case ventilation – engine service, reboring, decarbonisation, Nitriding of crank shaft.

Emissions : Emission from Automobiles – Pollution standards National and international – Pollution Control – Techniques – Energy alternatives – Photovoltaic, hydrogen, Biomass, alcohols, LPG and CNG.

UNIT II

FUEL SYSTEM AND COOLING SYSTEM

Fuel System in S.I. Engine : Fuel supply systems, Mechanical and electrical fuel pump – filters– carburetor – types – air filters – petrol injection-Multi point fuel injection(MPFI).

Fuel System in C.I. Engines: Requirements of diesel injection systems, types of injection systems, fuel pump, nozzle, spray formation, injection timing, testing of fuel pumps. CRDI engines.

Cooling System: Cooling Requirements, Air Cooling, Liquid Cooling, Forced Circulation System – Radiators – Types – Cooling Fan - water pump, thermostat, evaporative cooling – pressure sealed cooling – anti freeze solutions.

UNIT III

IGNITION SYSTEM AND ELECTRICAL SYSTEM

Ignition System: Function of an ignition system, battery ignition system, constructional features of storage, battery, auto transformer, contact breaker points, condenser and sparkplug – Magneto coil ignition system, electronic ignition system using contact breaker, electronic ignition using contact triggers – spark advance and retard mechanism.

Electrical System : Charging circuit, generator, current – voltage regulator – starting system, bendix drive mechanism solenoid switch, lighting systems, Horn, wiper, fuel gauge – oil pressure gauge, engine temperature indicator etc.

UNIT IV

TRANSMISSION AND STEERING SYSTEM

Transmission System: Clutches, principle, types, cone clutch, single plate clutch, multi plate clutch, magnetic and centrifugal clutches, fluid fly wheel – gear boxes, types, sliding mesh, constant mesh, synchro mesh gear boxes, epicyclic gear box, over drive, torque converter. Propeller shaft – Hotch – Kiss drive, Torque tube drive, universal joint, differential rear axles –types – wheels and tyres.

Steering System: Steering geometry – camber, castor, king pin rake, combined angle toein, center point steering. Types of steering mechanism – Ackerman steering mechanism, Davis steering mechanism, steering gears – types, steering linkages.

UNIT V

SUSPENSION AND BRAKING SYSTEM

Suspension System: Objects of suspension systems – rigid axle suspension system, torsion bar, shock absorber, Independent suspension system.

Braking System: Mechanical brake system, Hydraulic brake system, Master cylinder, wheel

Cylinder, tandem master cylinder, Requirement of brake fluid, Pneumatic and vacuum brakes.

TEXT BOOKS:

1.   Automobile Engineering -R B Gupta

2.   Automotive Mechanics – William Crouse

3.   Automobile Engineering Vol. 1 & Vol. 2 / Kripal Singh

REFERENCES

1.   Automotive Engineering / Newton Steeds & Garrett

2.   Automotive Mechanics / G.B.S. Narang

3.   Automotive Mechanics / Heitner

4.   Automotive Engines / Srinivasan

5.   Automobile Engineering – K.K. Ramalingam / Scitech Publications (India) PVT.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
HUMAN COMPUTER INTERACTION

(Open Elective-II)

Course Code: GR15A3164   **L T P C**

III Year II Semester   **2 1 0 3**

UNIT I

Introduction: Importance of user Interface –definition, importance of good design. Benefits of good design. A brief history of Screen design

The graphical user interface –popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user –Interface popularity, characteristics-Principles of user interface.

UNIT II

Design process –Human interaction with computers, importance of human characteristics, human consideration, Human interaction speeds, Understanding business junctions.

UNIT III

Screen Designing:-Design goals –Screen planning and purpose, organizing screen elements, ordering of screen data and content –screen navigation and flow –Visually pleasing composition –amount of information –focus and emphasis –presentation information simply and meaningfully –information retrieval on web –statistical graphics – Technological consideration in interface design.

UNIT IV

Develop System Menus and Navigation Schemes, -Select the proper kinds of Windows, -Select the proper Device based Controls, Choose the proper screen based controls.

UNIT V

Mobile Ecosystem: Platforms, Application frameworks- Types of Mobile Applications: Widgets, Applications, Games- Mobile Information Architecture, Mobile 2.0, Mobile Design: Elements of Mobile Design, Tools.

Interaction Devices – Keyboard and Function Keys – Pointing Devices – Speech Recognition Digitization and Generation – Image and Video Display – Drivers.

TEXT BOOKS

1.   The essential guide to user interface design, Wilbert O Galitz, Wiley Dreamtech.

2.   Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia

3.   Brian Fling, "Mobile Design and Development", First Edition, O Reilly Media Inc., 2009

REFERENCES

1.   Human – Computer Interaction. Alan Dix, Janet Fincay, GreGoryd, Abowd, Russell Bealg, Pearson Education

2.   Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.

3.   User Interface Design, Soren Lauesen, Pearson Education.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

ESSENTIALS OF BIG DATA ANALYTICS

(Open Elective – II)

Course Code: GR15A3165   **L T P C**

III Year II Semester   **2 1 0 3**

UNIT I

INTRODUCTION TO BIG DATA AND HADOOP: Introduction to Big Data Platform – Big Data definition, Challenges of Conventional Systems: Enterprise/structured data, Social/unstructured Data, Unstructured data needs for Analytics, Analytics vs Reporting, Data Analytic Tools, History of Hadoop, Components of Hadoop, Analyzing the Data with Hadoop, Different Echo systems of Hadoop, IBM Big Data Platform Strategy and Introduction to Infosphere Big Insights.

UNIT II

HDFS (Hadoop Distributed File System): Significance of HDFS in Hadoop, Design of HDFS, HDFS Architecture overview, 5 daemons of Hadoop: Name Node, Data Node, Secondary Node, Job Tracker and Task Tracker, their functionality, Data Storage in HDFS: Introduction about Blocks, Data replication, Accessing HDFS: CLI (Command Line Interface) and admin commands, How to store various types of data in HDFS using CLI-command.

UNIT III

Map Reduce Map Reduce Architecture, Map Reduce Programming Model, Map Reduce Java API, Anatomy of Map Reduce Job run, Failures, Job Scheduling, Sort & Shuffle phase, Task Execution. Map Reduce Program using IBM BigInsights. Adaptive Map Reduce.

Introduction to Oozie: Overview of Managing job Execution. Apache Pig: Introduction to Apache Pig, Map Reduce Vs Apache Pig, SQL Vs Apache Pig, Pig Datatypes, Modes Of Execution in Pig.

UNIT IV

Data Stores on Hadoop Hive: Introduction, architecture, Integration with Hadoop, Hive Tables: Managed Tables, External Tables, Hive Query Language (Hive QL) Hbase: Introduction to HBase, Architecture, HBaseVs RDBMS, HBaseUseCasesHmaster. Introduction to Zookeeper.

UNIT V

BM APPLICATIONS ON HADOOP

Big SQL: Introduction to Big SQL, Datatypes, Big SQL Statistics.

Big Sheets : Introduction, Processing and Accessing BigSheets, Big SQL Integration.

TEXT BOOKS

1. Tom White "Hadoop: The Definitive Guide" Third Edit on, O'reily Media, 2012.

REFERENCES

1. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.

2. Jay Liebowitz, "Big Data and Business Analytics" Auerbach Publications, CRC press (2013)

3. Tom Plunkett, Mark Hornick, "Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R Enterprise and Oracle R Connector for Hadoop", McGraw-Hill/Osborne Media (2013), Oracle press.

4. AnandRajaraman and Jefrey David Ulman, "Mining of Massive Datasets", Cambridge University Press, 2012.

5. Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley & sons, 2012.

6. Glen J. Myat, "Making Sense of Data", John Wiley & Sons, 2007

7. Pete Warden, "Big Data Glossary", O'Reily, 2011.

8. Michael Mineli, Michele Chambers, AmbigaDhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley Publications, 2013.

9. ArvindSathi, "Big Data Analytics: Disruptive Technologies for Changing the Game", MC Press, 2012

10. Paul Zikopoulos, Dirk De Roos, Krishnan Parasuraman, Thomas Deutsch, James Giles, David Corigan, "Harness the Power of Big Data The IBM Big Data Platform", Tata McGraw Hill Publications, 2012.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
PRINCIPLES OF OPERATING SYSTEMS

(OPEN ELECTIVE)

Course Code: GR15A3166   **L T P C**

III Year II Semester   **2   1   0   3**

UNIT I

Computer System and Operating System Overview: Overview of computer operating systems, operating systems functions, operating systems structures and systems calls, Evaluation of Operating Systems.

UNIT II

Process Management – Process concept- process scheduling, operations, Inter process communication. Multi Thread programming models. Process scheduling criteria and algorithms, and their evaluation.

UNIT III

Concurrency: Processsynchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors and Synchronization examples

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation

UNIT IV

Virtual Memory Management: virtual memory, demand paging, page- Replacement, algorithms, Allocation of Frames, Thrashing

Principles of deadlock – system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock,

UNIT V

File system Interface- the concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection.

File System implementation- File system structure, allocation methods, free-space management

Mass-storage structure overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, Introduction to Storage Area Networks (SAN), Introduction to Network Attached Storage.

TEXT BOOKS:

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.

2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

REFERENCES:

1. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.

2. Operating Systems A concept - based Approach, 2nd Edition, D. M. Dhamdhere, TMH.

3. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.

4. Operating Systems, A. S. Godbole, 2nd Edition, TMH

5. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.

6. Operating Systems, S, Haldar and A. A. Arvind, Pearson Education.

7. Operating Systems, R. Elmasri, A. G. Carrick and D. Levine, McGraw Hill.

8. Operating Systems in depth, T. W. Doeppner, Wiley.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

MANAGEMENT SCIENCE

Course Code: GR15A3102   **L T P C**

IV Year I Semester   **3   1 0 4**

UNIT I

Introduction to Management &Organization: Concepts of Management andOrganization: Nature, Importance, Functions and Theories of Management;Systems Approach to Management; Leadership Styles; Social Responsibilities of Management. Designing Organisational Structures: Basic concepts relating to Organisation;Departmentation and Decentralisation, Types and Evolution of mechanistic and organic structures of organisation and suitability.

UNIT II

Operations &Marketing Management: Principles and Types of Plant Layout,Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement.Statistical Quality Control: Control Charts for Variables and Attributes (Simple Problems) and Acceptance Sampling, Deming's contribution to quality. Objectives of InventoryControl, EOQ, ABC Analysis, Purchase Procedures, Stores Management and Stores Records - Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle, Channels of Distribution.

UNIT III

Human Resources Management (HRM): Concepts of Personnel Management,HRM and HRD and Industrial Relations (IR), HRM vs. PMIR. Basic functions of HR Manager: Manpower planning,

Recruitment and Selection, Training and Development, Placement, Wage and Salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Analysis, Job Description, and Job Evaluation.

UNIT IV

Project Management (PERT/CPM): Network Analysis, Programme Evaluationand Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing (simple problems).

UNIT V

Strategic Management and Contemporary Strategic Issues: Mission, Goals,Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning

Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives. Contemporary Management Practices: Basic concepts of MIS, End User Computing, Materials Requirement Planning (MRP), Just-In-Time (JIT) System, Total Quality Management (TQM), Six Sigma and Capability Maturity Model (CMM) Levels, Supply Chain Management, Enterprise Resource Planning (ERP), Performance Management, Business Process Outsourcing (BPO), Business Process Re-engineering and Bench Marking, Balanced Score Card.

TEXT BOOKS

1.   Aryasri: Management Science, TMH, 2009.

SCRIPTING LANGUAGES

Course Code: GR15A3060   **L:3 T:1 P:0 C:4**

IV Year I Semester

UNIT I

Introduction to Scripting: Scripts and Programs, Origin of Scripting, ScriptingToday, Characteristics of Scripting Languages, Web Scripting, and the universe of Scripting Languages.

PHP Basics: PHP Basics- Features, Embedding PHP Code in your Web pages,Outputting the data to the browser, Data types, Variables, Constants, expressions, string interpolation, control structures, Function, Creating a Function, Function Libraries, Arrays, strings and Regular Expressions.

UNIT II

MYSQL Basics: Introduction to MYSQL: Database Concepts, GeneralOverview of MYSQL database, Installation. Connecting and disconnecting from MYSQL Server, Querying the database, Data Definition Language, Functions and Logical operators, Access privilege system.

UNIT III

Advanced PHP Programming Part-1: PHP and Web Forms, Files, PHPAuthentication and Methodologies-Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP.

UNIT IV

Advanced PHP Programming Part-2: Sending Email using PHP, PHPEncryption Functions, the Mcrypt package, Building Web sites for the World – Translating Websites- Updating Web sites Scripts, Creating the Localization Repository, Translating Files, text, Generate Binary Files, Set the desired language within your scripts, Localizing Dates, Numbers and Times.

UNIT V

Python: Introduction to Python langauge, Python-syntax, statements, functions,Built-in-functions and Methods, Modules in Python, Exception Handling, Integrated Web Applications in Python – Building Small, Efficient Python Web Systems ,Web Application Framework.

TEXT BOOKS

1. The World of Scripting Languages, David Barron, Wiley India.

2. Beginning PHP and MySQL, 3rd Edition, Jason Gilmore, Apress Publications.

3. Python Web Programming, Steve Holden and David Beazley,New Riders Publications.

REFERENCES

1. Open Source Web Development with LAMP using Linux, Apache, MYSQL, Perl and PHP, Lee and B.Ware (Addison Wesley) Pearson Education.

2. Programming Python, M.Lutz, SPD.

3. PHP 6 Fast and Easy Web Development,Julie Meloni and Matt Telles, Cengage Learning Publications.

4. PHP 5.1,I.Bayross and S.Shah,The X Team,SPD.

5. Core Python Programming,Chun,Pearson Education.

6. Guide to Programming with Python,M.Dawson,Cengage Learning.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

MIDDLEWARE TECHNOLOGIES

Course Code: GR15A4104   **L T P C**

IV Year I Semester   **3 1 0 4**

UNIT I

CLIENT/SERVER CONCEPTS: Client – Server – File Server, Database server, Group server, Object server, Web server. Middleware – General middleware – Service specific middleware. Client/Server Building blocks-RPC – Messaging – Peer – to – Peer.

UNIT II

EJB ARCHITECTURE: EJB –EJB Architecture – Overview of EJB software architecture – View of EJB – Conversation – Building and Deploying EJBs – Roles in EJB.

UNIT III

EJB APPLICATIONS: EJB Session Beans – EJB entity beans – EJB clients –EJB Deployment – Building an application with EJB.

UNIT IV

CORBA: CORBA – Distributed Systems – Purpose – Exploring CORBA alternatives – Architecture overview – CORBA and networking model – CORBA object model – IDL – ORB – Building an application with CORBA.

UNIT V

COM: COM – Data types – Interfaces – Proxy and stub – Marshalling –Implementing server/Client – Interface pointers – Object Creation,

Invocation, Destruction – Comparison COM and CORBA – Introduction to .NET – Overview of .NET architecture–Marshalling – Remoting.

TEXT BOOKS

1. Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client/server Survival Guide", Galgotia publications Pvt. Ltd., 2002.(UNIT 1)

2. Tom Valesky, "Enterprise Java Beans", Pearson Education, 2002.(UNIT 2 & 3)

3. Jason Pritchard. "COM and CORBA side by side", Addison Wesley,2000 (UNIT 4 & 5)

4. Jesse Liberty, "Programming C#", 2nd Edition, O'Reilly press,2002. (UNIT 5)

REFERENCES

1. Mowbray, " Inside CORBA", Pearson Education, 2002.

2. Jeremy Rosenberger, "Teach yourself CORBA in 14 days", Tec media, 2000

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
SOFTWARE TESTING METHODOLOGIES
(Professional Elective – III)

Course Code:GR15A4077   **L T P C**
IV Year I Semester   **3 1 0 4**

UNIT I

Introduction: Purpose of testing, Dichotomies, Model for testing,Consequences of bugs, Taxonomy of Bugs

UNIT II

Flow Graphs and Path Testing: Basics concepts of Path Testing, Predicates,Path Predicates and Achievable Paths, Path Sensitizing, Path Instrumentation, Application of Path Testing. Transaction Flow Testing: Transaction flows, transaction flow testing techniques.

UNIT III

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

Domain Testing: Domains and paths, Nice & ugly domains, Domain Testing,domains and interfaces testing, domain and interface testing, domains and testability.

UNIT IV

Paths, Path products and Regular expressions: Path products & pathexpression, reduction procedure, applications, regular expressions & flow anomaly detection.

Logic Based Testing: Overview, decision tables, path expressions, kv charts,specifications.

UNIT V

State, State Graphs and Transition testing: State graphs, good & bad state

graphs, state testing, Testability tips.

Graph Matrices and Application: Motivational overview, matrix of graph,relations, power of a matrix, Node Reduction algorithm.

TEXT BOOKS

1. Software Testing techniques - BarisBeizer, Dreamtech, second edition.

2. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.

REFERENCE BOOKS

1. The craft of software testing - Brian Marick, Pearson Education.

2. Software Testing Techniques – SPD(Oreille)

3. Software Testing in the Real World – Edward Kit, Pearson.

4. Effective methods of Software Testing, Perry, John Wiley.

5. Art of Software Testing – Meyers, John Wiley.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

ARTIFICIAL INTELLIGENCE AND NEURAL NETWORKS

(Professional Elective – III)

Course Code:GR15A3061   **L T P C**

IV Year I Semester   **3 1 0 4**

UNITI

Introduction: AI problems, foundation of AI and history of AI intelligent agents,Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

Searching: Searching for solutions, uniformed search strategies – Breadth first search, depth first Search. Search with partial information (Heuristic search) Greedy best first search, A* search. Game Playing:Adversal search, Games, minmax, algorithm, optimal decisions in multiplayer games, Alpha-Beta pruning, Evaluation functions, cutting of search.

UNIT II

Knowledge Representation & Reasons: Logical Agents, Knowledge – BasedAgents, the Wumpus world, logic, propositional logic, Resolution patterns in propositional logic, Resolution, Forward & Backward Chaining.

First order logic: Inference in first order logic, propositional Vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution.

UNIT III

Characteristics of Neural Networks: Historical Development of NeuralNetworks Principles, Artificial Neural Networks: Terminology, Models of Neuron, Topology, Basic Learning Laws, Pattern Recognition

Problem, Basic Functional Units, Pattern Recognition Tasks by the Functional Units.

UNIT IV

Feedforward Neural Networks: Introduction, Analysis of pattern AssociationNetworks, Analysis of Pattern Classification Networks, Analysis of pattern storage Networks. Analysis of Pattern Mapping Networks.

Feedback Neural Networks: Introduction, Analysis of Linear Auto-associative FF Networks, Analysis of Pattern Storage Networks.

UNIT V

Competitive Learning Neural Networks & Complex pattern Recognition:

Introduction, Analysis of Pattern Clustering Networks, Analysis of Feature mapping Networks, Associative Memory.

TEXT BOOKS

1.   Artificial Intelligence – A Modern Approach. Second Edition, Stuart Russel, Peter Norvig, PHI/ Pearson Education.

2.   Artificial Neural Networks B. YagnaNarayana, PHI

REFERENCES

1.   Artificial Intelligence, 2nd Edition, E.Rich and K.Knight (TMH).

2.   Artificial Intelligence and Expert Systems – Patterson PHI.

3.   Expert Systems: Principles and Programming- Fourth Edn, Giarrantana/ Riley, Thomson.

4.   PROLOG Programming for Artificial Intelligence. Ivan Bratka-Third Edition – Pearson Education.

5.   Neural Networks Simon Haykin PHI

6.   Artificial Intelligence, 3rd Edition, Patrick Henry Winston., Pearson Edition.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

SEMANTIC WEB AND SOCIAL NETWORKS

(Professional Elective – III)

Course Code: GR15A4094   **L T P C**

IV Year I Semester   **3 1 0 4**

UNIT I

Web Intelligence: Thinking and Intelligent Web Applications, The Information Age ,The World Wide Web, Limitations of Today's Web, The Next Generation Web, Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT II

Knowledge Representation for the Semantic Web: Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web – Resource Description Framework(RDF) / RDF Schema, Ontology Web Language(OWL), UML, XML/XML Schema.

UNIT III

Ontology Engineering: Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping, Logic, Rule and Inference Engines.

UNIT IV

Semantic Web Applications, Services and Technology: Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base ,XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods,

UNIT V

Social Network Analysis and semantic web: What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks, Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.

TEXT BOOKS

1. Thinking on the Web - Berners Lee, Godel and Turing, Wiley inter science, 2008.

2. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.

REFERENCES

1. Semantic Web Technologies, Trends and Research in Ontology Based systems, J.Davies, R.Studer, P.Warren, John Wiley & Sons.

2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers,(Taylor & Francis Group)

3. Information Sharing on the semantic Web - HeinerStuckenschmidt; Frank Van Harmelen, Springer Publications.

4. Programming the Semantic Web, T.Segaran, C.Evans, J.Taylor, O'Reilly, SPD.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

SCRIPTING LANGUAGES LAB

Course Code: GR15A4084   **L T P C**

IV Year I Semester   **0   0 2 2**

PHP

Week-1

Write a PHP script for the following.

a. Find the biggest of 3 numbers.

b. Find the factorial of a number (while loop)

c. To reverse the digit (Use do while)

d. Find the sum of the digits (Use for loop)

e. Display the Fibonacci series for a particular limit.(Use for loop)

f. Check the given letter is vowel or not.

g. Check whether the given number is Prime or not.

Week-2

a. Write a PHP script to create an associative array with book details and display.

b. Write a PHP script to create an array and try with all array functions.

Week-3

a. Write a PHP script to create Cookie, store a value "Ganesh" in the cookie.

b. Write a PHP script to store, retrieve and delete data using session variables.

c. Write a program for Cinema Ticketing. All the age should be over 12 years, if less than, don't allow to get ticket. (apply the exception handling).

Week-4

a. Write a PHP program to display the contents of a file using fgets, fgetc, fread functions.

b. Write a PHP program to upload a file and display the contents in server.

Week-5

Create a registration form which contains fields name, Roll No, Gender and a submit button. All the details should be displayed in the server page when the user clicks the submit button.

Week-6

a. Design a database in MYSQL using PHP. Create table in database.Store, Update, Delete and Retrieve data from the table. Display the data from the table.

b. Design a PHP application that will provide a form containing fields to fill book detail (Book title, Author, Publication, ISBN, Price and category). Display filled details to the user.

Week-7

Write a PHP script that will demonstrate POSIX regular expressions for validating i)Name ii) Pin Code iii) Date iv) Email-id.

Week-8

Using PHP and MySQL, develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.

Week-9

Write a PHP script using scalar variables.

i.   Find the biggest of 3 numbers.

ii. To check whether a number is positive or negative.

iii. Find the factorial of a number (while loop)

iv. To reverse the digit (Use do while)

v. Find the sum of the digits (Use for loop)

vi. Fibonacci series for a particular limit.(Use for loop)

PHYTHON

Week-10

Write a Python script using basic data types.

a. Find the biggest of 3 numbers.

b. To check whether a number is positive or negative.

c. Find the factorial of a number

d. To reverse the digit

e. Find the sum of the digits

f. Fibonacci series for a particular limit.

Week-11

a. Write a Python script to test built in methods of Strings.

b. Write a Python script to test various functions of List and Tuple.

Week-12

a. Write a Python script to test various functions of Dictionary.

b. Write a Python script to define a function and calling the function by passing arguments. (using pass by value & pass by refere

T**EXT BOOKS**

a. Beginning.PHP.and.MySQL.3rd.Edition W. Jason Gilmore-Third Edition Apress publications

b. Python-Standard Library by Frederik Luth- O'Relly

c. Practical Programming in Python by Jeffery Elkener

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
MIDDLEWARE TECHNOLOGIES LAB

Course Code: GR15A4099   **L T P C**
IV Year I Semester   **0 0 2 2**

List of Experiments

Task1 : Create a distributed application to download various files from various servers using RMI.

Task2 : Create a Java Bean to draw various graphical shapes and display it using or without using BDK.

Task3 : Develop an Enterprise Java Bean for student Information System.

Task4 : Develop an Enterprise Java Bean for Library operations.

Task5 : Create an Active-X control for Timetable.

Task6 : Develop a component for converting the currency values using COM/.NET.

Task7 : Develop a component for encryption and decryption using COM/. NET.

Task8 : Develop a component for retrieving information from message box using DCOM/ .NET

Task9 : Develop a middleware component for retrieving Stock Market Exchange information Using CORBA.

Task10 : Develop a middleware component for retrieving Bank Balance using CORBA.

Task11 : Develop a middleware component for retrieving Weather Forecast information using CORBA.

Task12 : Create an application for converting case conversion using IDL.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

ANIMATIONS LAB

Course Code: GR15A4100   **L T P C**

IV Year I Semester   **0 0 2 2**

Week 1   **:**   An introduction of the various drawing and painting tools and theiruses

Week 2   **:**   A clean up drawing from a provided pencil sketch tools

Week 3   **:**   Design of a character displaying a pose from various perspectives. **Week 4:** Clean up of various poses on multiple layers.

Week 5   **:**   Several short animations will be produced using a series of traditionalanimation procedures.

Week 6   **:**   Create a walk cycle animations.

Week 7   **:**   A study of traditional animation skills.

Week 8   **:**   Create a 360 degree turn around animation of a character's headusing traditional pose-to-pose animation principles.

Week 9   **:**   Multi-plane and Shape Tweening

Week 10 **:**   Create a multi-plane scene with assets provided by the instructor

Week 11 **:**   Design assets and successfully create a shape tween.

Week 12 **:**   Instruction on the use of bones in animation softwares

Week 13 **:**   Introduction to various studio workflows used in the digital animationindustry.

Week 14 **:**   Create a scene for animation using proper layout procedures.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

GREEN BUILDING TECHNOLOGY

(Open Elective-III)

Course Code: GR15A4161		L T P C
IV Year I Semester		2 1 0 3

UNIT 1

Concept of Green Buildings:

Green building Definition, Features, Necessity, Initiatives, Green buildings in India, Green building Assessment- Green Building Rating Systems (BREEAM,USGBC,LEED,IGBC,TERI-GRIHA, GREEN STAR),Criteria for rating, Energy efficient criteria ,environmental benefits economic benefits, health and social benefits , Major energy efficiency areas for building, Contribution of buildings towards Global Warming. Life cycle cost of buildings, Codes and Certification Programs

UNIT II

Sources of Energy:

Renewable and Non-renewable sources of energy ; Coal, Petroleum, Nuclear, Wind, Solar, Hydro, Geothermal sources; potential of these sources, hazards, pollution; Global scenario with reference to demand and supply in India, Global efforts to reduce carbon emissions, Performance testing (new and existing): Building modeling , Energy analysis, Commissioning, Metering, Monitoring.

Carbon emission: Forecasting, Control of carbon emission, Air quality and its monitoring carbon foot print; Environmental issues, Minimizing carbon emission, Energy retrofits and Green Remodels.

UNIT III

Green Building Materials: Sustainably managed Materials, Depleting natural resources of building materials; renewable and recyclable

resources; energy efficient materials; Embodied Energy of Materials , Green cement, Biodegradable materials, Smart materials, Manufactured Materials, Volatile Organic Compounds (VOC's), Natural Non-Petroleum Based Materials, Recycled materials, Renewable and Indigenous Building Materials, Engineering evaluation of these materials.

Green Building Planning Methods, Energy Conservation Measures in Buildings, Waste &Water management and Recycling in Sustainable Facilities, Heating, Ventilation and Air Conditioning, Passive Solar & Daylight, Plumbing and its Effect on Energy Consumption

UNIT IV

Design of Green Buildings; Sustainable sites, Impact of building on environment, Life cycle assessment, Principles of sustainable development in Building Design ,Design on Bioclimatic **and Specifications:** Environment friendly and cost effective Building Technologies, Integrated Life cycle design of Materials and Structures, Green Strategies for Building Systems, Alternative Construction and solar passive architecture, Considerations of energy consumption, water use, and system reliability, indoor air quality, noise level, comfort, cost efficiency in building design, Advanced Green building technologies and innovations.

UNIT V

Construction of Green Buildings: Energy efficient construction, Practices for thermal efficiency and natural lighting. Eco- friendly water proofing; ECB codes building rating, Maintenance of green buildings, Cost and Performance Comparisons and Benchmarking, Green Project Management Methods and Best Practices, Cost/benefit analysis of green buildings,Life-cycle analysis of green buildings, Case studies of rated buildings (new and existing)

TEXT BOOKS:

1. Alternative Building Materials and Technologies – By K S Jagadeesh, B V Venkatta Rama Reddy & K SNanjunda Rao – New Age International Publishers

2. Integrated Life Cycle Design of Structures – By AskoSarja – SPON Press

3. Non-conventional Energy Resources – By D S Chauhan and S K Sreevasthava – New Age InternationalPublishers

4. Green Buildings (McGraw hill publication): by Gevorkian

5. Emerald Architecture: case studies in green buildings, The Magazine of Sustainable Design

6. Understanding Green Building Guidelines: For Students and Young Professionals, Traci Rose Rider ,W. W. Norton & Company Publisher.

7. Understanding Green Building Materials,Traci Rose Rider, W. W. Norton & Company Publisher.

REFERENCES

1. IGBC reference guide

2. Free abridged versions of LEED reference guides

3. ECBC latest version

4. US GBC's Reference Material:

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
SOFT COMPUTING TECHNIQUES
(Open Elective-III)

Course Code: GR15A4162   **L T P C**

IV Year I Sem   2 1 0 3

UNIT I

Neural Networks-I(Introduction & Architecture) Neuron, Nerve structure and synapse, Artificial Neuron and its model, activation functions, Neural network architecture: single layer and multilayer feed forward networks, recurrent networks. Various learning techniques; perception and convergence rule, Auto-associative and hetero-associative memory.

UNIT II

Neural Networks-II (Back propagation networks) Architecture: perceptron model, solution, single layer artificial neural network, multilayer perception model; back propagation learning methods, effect of learning rule co-efficient; back propagation algorithm, factors affecting back propagation training, applications.

UNIT III

Fuzzy Logic-I (Introduction) Basic concepts of fuzzy logic, Fuzzy sets and Crisp sets, Fuzzy set theory and operations, Properties of fuzzy sets, Fuzzy and Crisp relations, Fuzzy to Crisp conversion.

UNIT IV

Fuzzy Logic –II (Fuzzy Membership, Rules) Membership functions, interference in fuzzy logic, fuzzy if-then rules, Fuzzy implications and Fuzzy algorithms, Fuzzyfications & Defuzzificataions, Fuzzy Controller, Industrial applications.

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UNIT V

Genetic Algorithm(GA) Basic concepts, working principle, procedures of GA, flow chart of GA, Genetic representations, (encoding) Initialization and selection, Genetic operators, Mutation, Generational Cycle, applications.

TEXT BOOKS:

1. S. Rajsekaran & G.A. Vijayalakshmi Pai, "Neural Networks,Fuzzy Logic and Genetic Algorithm:Synthesis and Applications" Prentice Hall of India.

2. Introduction to Artificial Neural Systems - Jacek M. Zuarda, Jaico Publishing House, 1997.

3. N.P.Padhy,"Artificial Intelligence and Intelligent Systems" Oxford University Press.

REFERENCES

1. Timothy J. Ross, "Fuzzy Logic with Engineering Applications" Wiley India

2. P. Vas: Artificial-Intelligence-Based Electrical Machines and Drives: Application of Fuzzy, Neural, Fuzzy- Neural, and Genetic-Algorithm-Based Techniques, Oxford University Press, 1999.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
OPERATION RESEARCH
(Open Elective-III)

Course Code: GR15A4163   **L T P C**
IV B. Tech I Semester   **2 1 0 3**

UNIT I

INTRODUCTION: Development – Definition– Characteristics and Phases of operations Research– Types of models – operation Research models– applications.

ALLOCATION: Linear Programming Problem Formulation – Graphical solution – Simplex method –Artificial variables techniques - Two–phase method, Big-M method – Duality Principle.

UNIT II

TRANSPORTATION MODELS: Formulation – Methods for finding feasible solution, Optimal solution, unbalanced transportation problem –Degeneracy.

ASSIGNMENT MODELS - Formulation – Optimal solution - Variants of Assignment Problem

UNIT III

SEQUENCING: Introduction – Flow –Shop sequencing – n jobs through two machines – n jobs through three machines – Job shop sequencing – two jobs through 'm' machines.

INVENTORY : Introduction – Single item – Deterministic models – Purchase inventory models with one price break and multiple price breaks – shortages are not allowed – Stochastic models – demand may be discrete variable or continuous variable – Instantaneous production. Instantaneous demand and continuous demand and no set up cost.

UNIT IV

THEORY OF GAMES: Introduction – Minimax (maximin) – Criterion and optimal strategy – Solution of games with saddle points – Rectangular

games without saddle points – 2 X 2 games – dominance principle– m X 2 & 2 X n games -graphical method.

WAITING LINES: Introduction – Single Channel – Poisson arrivals – exponential service times – with infinite population and finite population models– Multichannel – Poisson arrivals – exponential service times with infinite population single channel Poisson arrivals.

UNIT V

REPLACEMENT: Introduction – Replacement of items that deteriorate with time – when money value is not counted and counted – Replacement of items that fail completely, group replacement.

DYNAMIC PROGRAMMING: Introduction – Bellman's Principle of optimality – Applications of dynamic programming- capital budgeting problem – shortest path problem – linear programming problem.

TEXT BOOKS :

1. Operations Research/ Prem Kumar Gupta,Dr.D.S. Hira

2. Operations Research / S. D.Sharma-Kedarnath

3. Operation Research /J.K.Sharma/MacMilan.

REFERENCES:

1. Operations Research / R.Pannerselvam,PHI Publications.

2. Introduction to O.R /Taha/PHI

3. Operations Research / Wagner/ PHI Publications.

4. Introduction to O.R/Hiller &Libermann (TMH).

5. Operations Research /A.M.Natarajan,P.Balasubramani,A. Tamilarasi/Pearson Education.

6. Operations Research: Methods & Problems / Maurice Saseini, ArhurYaspan& Lawrence Friedman

7. O.R/Wayne L.Winston/Thomson Brooks/cole

MOBILE COMPUTING AND APPLICATIONS
(Open Elective III)

Course Code: GR15A4164   **L T P C**

IV Year I Semester   **2 1 0 3**

UNIT I

Introduction to Mobile Computing: Introduction, applications, simplified referenced model.

Medium Access Control: Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA, Comparison.

UNIT II

Telecommunication systems: GSM:Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

UNIT III

Mobility and location-based services: Introduction, Data Acquisition of Location Information, GIS, Location Information Modeling, Location-Based Services Applied, Utilizing Location-Based Services with Mobile Applications, Representing Location with UML, Security and Privacy of Location Information, Localization and Internationalization, Latest Developments in Location-Based Efforts

UNIT IV

The Mobile Development Process: Introduction, Back to the Dimensions of Mobility, Applying the Wisdom Methodology to Mobile Development, UML-Based Development Cycle for Mobile Applications

Architecture, Design, and Technology Selection for Mobile Applications:
Introduction, Practical Concerns with Architectures, Architectural Patterns for Mobile Applications

UNIT V

Mobile Application Development Hurdles: Introduction, Voice User Interface Hurdles, Hurdles with Multimodal Applications, Problems with Building Location-Based Applications, Power Use.

Testing Mobile Applications: Introduction, Validating the Mobile Use Cases before Development, The Effect of the Dimensions of Mobility on Software Testing, Stress Testing and Scalability Issues, Testing Location-Based Functionality.

Support for Mobility: File systems: Consistency, coda, little work, Ficus, Mio-NFS, Rover.

Outlook: Architecture of future networks.

TEXT BOOKS

1.   **Jochen Schiller**, "Mobile Communications", Second Edition, Pearson education, 2004. (Unit I-All chapters, Unit II-All chapters, & Unit V: Last two chapters)

2.   **Reza B'far, "**Mobile Computing Principles: Designing And Developing Mobile Applications With UML And XML", Cambridge University Press, 2005. (Unit III-All chapters, Unit IV-All chapters and Unit V - First two chapters).

REFERENCES

1.   **Adelstein, Frank, Gupta, Sandeep KS, Richard, Golden, Schwiebert, Loren,** "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw-Hill Professional, 2005.

2.   **Hansmann, Merk, Nicklous, Stober**, "Principles of Mobile Computing", Springer, second edition, 2003.

3.   **Martyn Mallick,** "Mobile and Wireless Design Essentials", Wiley DreamTech, 2003.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
BUSINESS INTELLIGENCE
(Open Elective – III)

Course Code:GR15A4165   **L T P C**

IV Year I Semester   **2 1 0 3**

UNIT I

Business Data and Business Intelligence: An Introduction: What is data? Data and business, Big Data, Information and insight, challenges in data decision, operational and informational data, Data decision challenge, Decision Support System, understanding Business Intelligence, Business Intelligence and its components, Importance of Business Intelligence, Business Intelligence areas, Business Intelligence Implementation, Business Intelligence and Integration Implementation, Overview of IBM Cognos BI.

UNIT II

Data warehouse: An Overview Data warehouse architecture, Data warehouse Modelling and Design, Challenges , Data Modelling requirements, Modelling Techniques; Entity relationship Modelling, Dimensional Modelling, Temporal Modelling, Multidimensional data modelling, ERM Vs MDDM, What is Metadata, Types of metadata, Benefits of metadata, Data Analytics Techniques: OLAP and OLTP systems

UNIT III

Building and Accessing a Data Warehouse: Enterprise data warehouse, Challenges of Building a Warehouse, Data warehouse for decision support system, Data Analytics, Data analytics techniques, Information Mining Vs Data mining, Usage of Data Mining, Information Integration,

Data warehouse Master Data Management System, MDM Logical Architecture, DB2 UDB Warehouse

UNIT IV

IBM Cognos BI: IBM Cognos Framework Manager, Connection of Framework Manager to Cognos Business Intelligence, Framework Manager Query Model, Frame work manager Model Types, Enterprise Components, Architecture, Security, Query Modes, Model types, Framework Manager Workflow, Administration Workflow, Cognos Configuration

UNIT V

Query and Reporting: Query and Process flow, Report studio, Generation of different reports such as List, cross tab ,Charts, Prompts etc, Focus reports using prompts and filters, Drilling from one report to another, Report using Relational Data

TEXT BOOKS

1.   Chuck Ballard, Dirk Herreman, Don Schau, Rhonda Bell,Data Modeling Techniques for Data Warehousing , IBM [ebook]

2.   Business Analytics : Data Analytics & Decision Making by S. Christian Albright and Wayne L. Winston.

3.   Analytics at Work by Morisson

4.   Competing on Analytics - Davenport

5.   IBM Cognos 10 Report Studio : Practical Examples by Philip & Roger

6.   IBM Cognos BI 10.2 Administration Essentials by Mehmood Awan Khalid

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
PRINCIPLES OF SATELLITE COMMUNICATIONS
(OPEN ELECTIVE-III)

Course Code: GR15A04166   **L T P C**

IV Year I Semester   **2 1 0 3**

UNIT I

Introduction: Origin of satellite communications, Historical background, basic concepts of satellite communications, frequency allocations for satellite services, applications, future trends of satellite communications.

UNIT II

Orbital Mechanics and Launchers: Orbital Mechanics look angle determination, orbital perturbations, orbit determination, launches and launch vehicles, orbital effects in communication systems performance.

UNIT III

Satellite Subsystems: Attitude and orbital control system, Telemetry, Tracking, command and monitoring, power systems, communication subsystems, satellite antenna equipment reliability and space qualification.

UNIT IV

Satellite Link Design: Basic transmission theory, system noise temperature and G/T ratio, design of down links, uplink design, design of satellite links for specified C/N, system design example.

UNIT V

Earth Station Technology: Introduction, transmitters, receivers, Antennas, tracking systems, terrestrial interface, primary power test methods.

Low Earth Orbit and Geo-stationary Satellite Systems: Orbit consideration, coverage and frequency considerations, delay and throughput considerations, system considerations, operational NGSO constellation designs.

TEXT BOOKS

1.   Satellite communications-Timothi Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2nd Edition, 2003.

2.   Satellite communications Engineering-Wilbur L.Prichard, Robert A. Nelson & Henry G. Suyderhoud, 2nd Edition, Pearson Publications, 2003.

REFERENCES

1.   Satellite communications: Design principles-M. Richharia, BS publications, 2nd Edition, 2003.

2.   Fundamentals of Satellite communications-K.N.Rajarao, PHI, 2004.

3.   Satellite communications-Dennis Roddy, McGraw Hill, 2nd Edition, 1996.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

MOBILE APPLICATION DEVELOPMENT

Course Code:GR15A4082   **L T P C**

IV Year II Semester   **3 1 0 4**

UNIT I

Java Concepts: OOPs Concepts, Inheritance in detail, Exception handling, Packages & interfaces o JVM & .jar file extension, Multi threading (Thread class & Runnable Interface), SQL-DML and DDL Queries.

Introduction to Android: What is Android? Setting up development environment, Dalvik Virtual Machine & .apk file extension, Fundamentals: a. Basic Building blocks - Activities, Services, Broadcast Receivers & Content providers b. UI Components - Views & notifications c. Components for communication -Intents & Intent Filters , Android API levels (versions & version names).

UNIT II

Application Structure(in detail): Android Manifest. xml, uses-permission & uses-sdk, Resources & R.java , Assets , Layouts & Drawable Resources ,Activities and Activity lifecycle , First sample Application

Emulator-Android Virtual Device: Launching emulator , Editing emulator settings, Emulator shortcuts , Log cat usage , Introduction to DDMS, Basic UI design, Preferences, Menu, Intents, UI design, Tabs and Tab Activity, Styles & Themes , Examples.

UNIT III

Content Providers: SQLite Programming , SQLite OpenHelper ,SQLite Databse, Cursor , Reading and updating Contacts, Reading bookmarks, Examples.

.**UNIT IV**

Android Debug Bridge (adb) tool : Linkify- Web URLs, Email address, text,map address, phone numbers , MatchFilter & TransformFilter , Adapters and Widgtes- Adapters:-ArrayAdapters, Base Adapters, ListView and ListActivity ,Custom listview GridView using adapters , Gallery using adapters ,Notifications, Examples.

Custom components: Custom Tabs, Custom animated popup panels, Other components, Examples.

UNIT V

Threads: Threads running on UI thread (runOnUiThread) , Worker thread ,Handlers & Runnable ,AsynTask (in detail) ,Examples.

Advanced Concept: Live Folders ,Using sdcards , XML Parsing , JSON Parsing, Maps, GPS, Location based Services ,Accessing Phone services (Call, SMS, MMS) , Network connectivity services ,Sensors.

TEXT BOOKS

1. Android How to Program with an Introduction to Java, Deitel, Deitel and Deitel, Prentice Hall, ISBN 978-0-13-299054-7.

2. Android for Programmers: An App-Driven Approach, Deitel, Deitel, Deitel, and Morgano, Prentice Hall, ISBN 978-0-13-2121361.

REFERENCES

1. Java JDK 6 or later, Eclipse 3.6.2 or later, Android SDK – latest version, Android ADT plugin for Eclipse.

2. Andriod Studio Development Essentials, CreateSpace Independent Publishing Platform; 1 edition - Neil Smyth.

3. Andriod Apps for Absolute Beginners, Aprèss, Wallace Jackson.

4. Andriod Apps with Eclipse,Apress,Onur Cinar.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

SOFTWARE PROJECT MANAGEMENT

(Professional Elective – IV)

Course Code: GR15A4101   **L T P C**

IV Year II Semester   **3 1 0 4**

UNIT I

Conventional Software Management: The waterfall model, conventional

software Management performance.

Evolution of Software Economics: Software Economics, pragmatic softwarecost estimation.

Improving Software Economics: Reducing Software product size, improvingsoftware processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

UNIT II

Life cycle phases: Engineering and production stages, inception, Elaboration,construction, transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineeringartifacts, programmatic artifacts.

Model based software architectures: A Management perspective and

technical perspective.

UNIT III

Work Flows of the process: Software process workflows, Iteration workflows,Checkpoints of the process :Major mile stones, Minor Milestones, Periodic status assessments.

UNIT IV

Iterative Process Planning: Work breakdown structures, planning guidelines,cost and schedule estimating, Iteration planning process, Pragmatic planning. Project Organizations and Responsibilities:Line-of-Business Organizations, Project Organizations, evolution of Organizations.

UNIT V

Process Automation:Automation Building blocks, The Project Environment. Project Control and Process instrumentation:The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

TEXT BOOKS

1.   Software Project Management, Walker Royce: Pearson Education, 2005.

REFERENCES

1.   Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw- Hill Edition.

2.   Software Project Management, Joel Henry, Pearson Education.

3.   Software Project Management in practice, PankajJalote, Pearson Education.2005.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

CLOUD COMPUTING

(Professional Elective – IV)

Course Code: GR15A4079   **L T P C**

IV Year IISemester   **3 1 0 4**

UNIT I

Cloud Architecture and Models: Technologies for Network-Based System –System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture. Cloud Models:- Characteristics – Cloud Services – Cloud models (IaaS, PaaS, SaaS) – Public vs Private Cloud –Cloud Solutions - Cloud ecosystem – Service management – Computing on demand.

UNIT II

Virtualization: Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation.

UNIT III

Cloud Infrastructure: Architectural Design of Compute and Storage Clouds –Layered Cloud Architecture Development – Design Challenges - Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources.

UNIT IV

Programming Model: Parallel and Distributed Programming Paradigms –MapReduce, Twister and Iterative Map Reduce – Hadoop Library from

Apache – Mapping Applications - Programming Support - Google App Engine,

Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim

UNIT V

Security in the Cloud: Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.

TEXT BOOKS

1. George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud" O'Reilly

2. Kumar Saurabh, " Cloud Computing – insights into New-Era Infrastructure", Wiley India,2011

3. RajkumarBuyya, Christian Vecchiola, S.TamaraiSelvi, 'Mastering Cloud Computing", TMGH,2013.

REFERENCES

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.

2. John W.Rittinghouse and James F.Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 2010.

3. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", TMH, 2009.

4. Ronald L. Krutz, Russell Dean Vines, "Cloud Security – A comprehensive Guide to Secure Cloud Computing", Wiley – India, 2010.

5. Nick Antonopoulos, Cloud computing, Springer Publications, 2010

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
E-COMMERCE
(Professional Elective – IV)

Course Code: GR15A4091   **L T P C**

IV Year II Semester   **3 1 0 4**

UNITI

Electronic Commerce - Framework, anatomy of E-Commerce applications, E- commerce Consumerapplications,E-Commerce organization applications. Consumer OrientedElectroniccommerce-MercantileProcessmodels.

UNITII

Electronicpaymentsystems-DigitalToken-Based, Smart Cards, Credit Cards, Risksin Electronic Paymentsystems. Inter Organizational Commerce - EDI, EDI Implementation, Valueaddednetworks.

UNITIII

Intra Organizational Commerce - work Flow, Automation Customizationand internal Commerce, Supplychain Management. Corporate DigitalLibrary-Document Library, digital Documenttypes, corporate Data Warehouses.

UNITIV

AdvertisingandMarketing-Information based marketing, Advertising on Internet, on-line marketing process, market research.

ConsumerSearchandResourceDiscovery-InformationsearchandRetrieval, CommerceCatalogues,InformationFiltering.

UNITV

Multimedia-keymultimediaconcepts,DigitalVideoandelectronicCommerce,
Desktopvideoprocessing's,Desktopvideoconferencing.

TEXTBOOKS

1.   Frontiersofelectroniccommerce–Kalakata,Whinston,Pearson.

REFERENCES

1.   E-Commerce fundamentals and applications Hendry Chan,
        Raymond Lee, Tharam Dillon, Ellizabeth Chang, JohnWiley.

2.   E-Commerce,S.Jaiswal–Galgotia.

3.   E-Commerce, EfrainTurbon,Jae Lee, David King, H.Michael Chang.

4.   ElectronicCommerce–GaryP.Schneider–Ce yngageLearning..

5.   E-Commerce–Business,Technology,Society,KennethC.Taudon,
        Carol GuyericoTraver.

6.   ElectronicCommerce,B.Bhaskar,3rdedition,TMH.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

DESIGN PATTERNS

(Professional Elective – V)

Course Code: GR15A4090   **L T P C**

IV Year II Semester   **3 1 0 4**

UNIT I

Introduction: What Is a Design Pattern?, Design Patterns in Smalltalk MVC,Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT II

A Case Study: Designing a Document Editor: Design Problems, DocumentStructure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary.

UNIT III

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype,Singleton, Discussion of Creational Patterns.

Structural Pattern Part-I: Adapter, Bridge, Composite.

UNIT IV

Structural Pattern Part-II: Decorator, Façade, Flyweight, Proxy.

Behavioral Patterns Part-I: Chain of Responsibility, Command, Interpreter,Iterator.

UNIT V

Behavioral Patterns Part-II: Mediator, Memento, Observer, State, Strategy,Template Method Visitor, Discussion of Behavioral Patterns. What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

TEXT BOOKS

1.   Design Patterns by Erich Gamma, Pearson Education

REFERENCES

1.   Pattern's in JAVA Vol-I by Mark Grand,Wiley DreamTech.

2.   Pattern's in JAVA Vol-II by Mark Grand,Wiley DreamTech.

3.   JAVA Enterprise Design Patterns Vol-III by Mark Grand,Wiley DreamTech.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

AD-HOC SENSOR NETWORKS

(Professional Elective – V)

Course Code: GR15A4102   **L T P C**

IV Year II Semester   **3 1 0 4**

UNIT I

ADHOCNETWORKSFUNDAMENTALS AND MACPROTOCOLS:

Fundamentals Of WLANS -IEEE 802.11 Architecture -Self Configuration And Auto Configuration-Issues In Ad-Hoc Wireless Networks –MAC Protocols For Ad-Hoc Wireless Networks – Contention Based Protocols -TCP Over Ad-Hoc Networks-TCP Protocol Overview -TCP And MANETs –Solutions For TCP Over Ad-Hoc Networks

UNIT II

ADHOC NETWORK ROUTING AND MANAGEMENT: Routing in Ad-HocNetworks-Introduction -Topology based versus Position based Approaches - Proactive, Reactive, Hybrid Routing Approach -Principles and issues –Location services -DREAM –Quorums based Location Service –Grid –Forwarding Strategies –Greedy Packet Forwarding – Restricted Directional Flooding-Hierarchical Routing-Other Routing Protocols.

UNIT III

SENSOR NETWORK COMMUNICATION PROTOCOLS: Introduction –Architecture -Single Node Architecture –Sensor Network Design Considerations –Energy Efficient Design Principles for WSNs – Protocols for WSN –Physical Layer –Transceiver Design Considerations –MAC Layer Protocols – IEEE 802.15.4 Zigbee –Link Layer and Error Control Issues - Routing Protocols –Mobile Nodes and Mobile Robots - Data Centric &ContentionBased Networking –Transport Protocols &QoS –Congestion Control Issues – Application Layer Support.

UNIT IV

SENSOR NETWORK MANAGEMENT AND PROGRAMMING:
SensorManagement - Topology Control Protocols and Sensing Mode
Selection Protocols –Time Synchronization -Localization and Positioning
– Operating Systems and Sensor Network Programming –Sensor
Network Simulators.

UNIT V

ADHOC AND SENSOR NETWORK SECURITY: Security in Ad-
Hoc and Sensor Networks – KeyDistribution and Management –Software
based Anti-tamperTechniques –Water Marking techniques –Defense
against Routing Protocols –Broadcast Authentication WSN Protocols –
TESLA –Biba –Sensor Network Security Protocols – SPINS

TEXT BOOKS

1. C. Siva Ram Murthy, and B. S. Manoj, "Ad Hoc Wireless
    Networks: Architectures and Protocols ", Prentice Hall Professional
    Technical Reference, 2008. .

REFERENCES

1. Carlos De Morais Cordeiro, Dharma Prakash Agrawal "Ad Hoc &
    Sensor Networks: Theory and Applications", World Scientific
    Publishing Company, 2006.

2. Feng Zhao and Leonides Guibas, "Wireless Sensor Networks",
    Elsevier Publication – 2002.

3. Holger Karl and Andreas Willig "Protocols and Architectures for
    Wireless Sensor Networks", Wiley, 2005

4. Kazem Sohraby, Daniel Minoli, & Taieb Znati, "Wireless Sensor
    Networks-Technology, Protocols, and Applications", John Wiley,
    2007.

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY

NETWORK PROGRAMMING

(Professional Elective –V)

Course Code: GR15A4098　　　　　　　　　　　　**L T P C**

IV Year IISemester　　　　　　　　　　　　　　**3 1 0 4**

UNIT I

Introduction to Network Programming: OSI model, Unix standards, TCP andUDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

Sockets: Address structures, value – result arguments, Byte ordering andmanipulation function and related functions Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.

UNIT II

TCP client server: Introduction, TCP Echo server functions, Normal startup,terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.

UNIT III

I/O Multiplexing and socket options: I/O Models, select function, Batch input,shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket option ICMPV6 socket option IPV6 socket option and TCP socket options.

UNIT IV

Elementary UDP sockets: Introduction UDP Echo server function, lostdatagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.

UNIT V

Elementary name and Address conversions: DNS, gethostbyname function,Resolver option, Function and IPV6 support, uname function, other networking information. Remote Login: Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC Transparency Issues.

TEXT BOOK

1.   UNIX Network Programming, Vol. I, Sockets API, 2nd Edition. - W.Richard Stevens, Pearson Edn. Asia.

2.   UNIX Network Programming, 1st Edition, - W.Richard Stevens. PHI.

REFERENCE BOOKS

1.   UNIX SYSTEMS PROGRAMMING USING C++ T CHAN, PHI.

2.   UNIX for programmers and Users, 3RD Edition, GRAHAM GLASS, KING ABLES, Pearson Education.

3.   Advanced UNIX programming, 2nd edition, M J Rochkindpearson education

MOBILE APPLICATION DEVELOPMENT LAB

Course Code: GR15A4105   **L T P C**

IV Year II Semester   **0 0 2 2**

Task - 1: Installation of Android SDK.

1. Installing jdk1.6 above version.

2. Installing the Android Studio IDE.

3. Installing Android SDK.

4. Installing Android Development Tools

5. Choosing which Android version to use

6. Creating and starting an android emulator.

Task –2: Create anAndroid app to demonstrate the application Lifecycle.

Task– 3: Create anAndroid application to create a simple Registration form using the following UI elements.

1. TextView

2. EditText

3. Radio Button

4. CheckBoxes

5. Button

Task – 4 : Create an Android application which implements different Layouts and widget controls such as Text controls, Button controls , Toggle buttons, and to display Images.

Task – 5 : Create an Android application to display a slideshow of images which scroll automatically after a certain period of time.

Task – 6 : Create an Android application using Intents for the Registration form in Task -3. The application must send form data from first activity to another and display the details in the second activity.

Task – 7 : Create an Android application to implement a custom ListView which displays a list of students names along with their roll number and picture.

Task – 8 : Create an Android application to implement custom GridView which displays all the B.Tech branch logos along with their branch name.

Task – 9 : Create an Android application for working with Dialogs and Toast messages.

Task – 10 : Create an Android application for working with Tabs and Fragments.

Task – 11 : Using SQLite in Android create an application for retrieving the time table of a class by taking the year and section as inputs from the user.

Task – 12 : Create an Android application for displaying and controlling music playback.

Task – 13 : Create an Android application for implementing a basic Android Service Class and its lifecycle.

Task – 14 : Create an Android application to find the current location using Google Maps API and GPS services