Academic Regulations
Programme Structure
&
Detailed Syllabus

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

Department of Information Technology

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

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

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

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

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

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

4. **Programme Pattern:**
   a) Each Academic year of study is divided into two semesters.
   b) Minimum number of instruction days in each semester is 90.
   c) **Student is introduced to "Choice Based Credit System (CBCS)"**
   d) **Grade points, based on percentage of marks awarded for each course will form the basis for calculation of SGPA (Semester Grade Point Average) and CGPA (Cumulative Grade Point Average).**
   e) The total credits for the Programme is 192. Typically each semester has 24 credits.
   f) **A student has a choice of registering for credits from the courses offered in the programme ensuring the total credits in a semester are between 20 and 28.**
   g) **All the registered credits will be considered for the calculation of final CGPA.**
   h) Each semester has - 'Continuous Internal Evaluation (CIE)' and 'Semester End Examination (SEE)'. Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) as indicated by UGC and course structure as suggested by AICTE are followed.

   i) **Subject / Course Classification** All subjects/ courses offered for the under graduate programme in E&T (B.Tech. degree programmes) are broadly classified as follows.

S. No.	Broad Course Classification	Course Group/ Category	Course Description
1	Foundation Courses (FnC)	BS – Basic Sciences	Includes mathematics, physics and chemistry subjects
2		ES - Engineering Sciences	Includes fundamental Engineering subjects
3		HS – Humanities and Social sciences	Includes subjects related to humanities, social sciences and management
4	Core Courses (CoC)	PC – Professional Core	Includes core subjects related to the parent discipline/ department/ branch of Engineering.
5		PE – Professional Electives	Includes elective subjects related to the parent discipline/ department/ branch of Engineering.
6	Elective Courses (EℓC)	OE – Open Electives	Elective subjects which include interdisciplinary subjects or subjects in an area outside the parent discipline/ department/ branch of Engineering.
7	Core Courses	Project Work	B.Tech. project or UG project or UG major project
8		Industrial training/ Mini-project	Industrial training/ Internship/ UG Mini-project/ Mini-project
9		Seminar	Seminar/ Colloquium based on core contents related to parent discipline/ department/ branch of Engineering.
10	Minor courses	-	1 or 2 Credit courses (subset of HS)
11	Mandatory Courses (MC)	-	Mandatory courses Credits/Marks are not counted for grading/pass percentage

5. **Award of B. Tech Degree:** A student will be declared eligible for the award of B. Tech Degree if he/she fulfills the following academic requirements:
   a) He/She pursues the course of study and completes it successfully in not less than four academic years and not more than eight academic years.
   b) A student has to register for all the 192 credits and secure all credits.
   c) A student, who fails to fulfill all the academic requirements for the award of the degree

within eight academic years from the date of admission, shall forfeit his/her seat in B. Tech course.

d) The Degree of B. Tech in Information Technology shall be conferred by Jawaharlal Nehru Technological University Hyderabad (JNTUH), Hyderabad, for 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 for 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	50	-	50
7	Major Project	50	150	200

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

Assessment Procedure:

S. No	Component of Assessment	Marks Allotted	Type of Assessment	Scheme of Examinations

1	Theory	30	Internal Exams & Continuous Evaluation	1) Two mid semester examinations shall be conducted for 20 marks each for a duration of 2 hours. Average of the two mid exams shall be considered **i) Subjective - 15 marks** **ii) Objective - 5 marks** **2) Tutorials/Assignments - 5 marks** **3) Continuous Assessment – 5 marks**
		70	Semester-end examination	The semester-end examination is for a duration of 3 hours
2	Practical	25	Internal Exams & Continuous Evaluation	**i) Internal Exam-10 marks** **ii) Record - 5 marks** **iii) Continuous Assessment - 10 marks**
		50	Semester-end examination	The semester-end examination is for a duration of 3 hours

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

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

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

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

presence of external examiner and is evaluated for 150 marks, Project Review Committee consists of HOD, Project Coordinator and Supervisor.

h) Engineering Graphics:

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

• Submission of day to day work - 15 marks.

• Continuous Assessment - 5 marks.

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

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

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

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

12. Academic Requirements and Promotion Rules:

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

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

S. No.	Promotion	Conditions to be fulfilled
1	**First year first semester to first year second semester**	**Regular course of study of first year first semester.**
2	**First year second semester to second year first semester**	**Regular course of study of first year second semester. (ii) Must have secured at least 24 credits out of 48 credits i.e., 50% credits up to first year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.**
3	**Second year first semester to second year second semester**	**Regular course of study of second year first semester.**
4	**Second year second semester to third year first semester**	**Regular course of study of second year second semester. (ii) Must have secured at least 58 credits out of 96 credits i.e., 60% credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.**
5	**Third year first semester to third year second semester**	**Regular course of study of third year first semester.**
6	**Third year second semester to fourth year first semester**	**(i) Regular course of study of third year second semester.**

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

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

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

Earning of Credit:

A student shall be considered to have completed a course successfully and earned the credits if he/she secures an acceptable letter grade in the range O-C. 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.,**

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

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

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

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

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

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

	Class Awarded	CGPA Secured
14.1	First Class With Distinction	CGPA 8.00 with no F or below grade/ detention anytime during the programme
14.2	First Class	CGPA 8.00 with rest of the clauses of 14.1 not satisfied
14.3	First Class	CGPA ≥ 6.50 and CGPA < 8.00

14.4	Second Class	CGPA $\geq$ 5.50 and CGPA < 6.50
14.5	Pass Class	CGPA $\geq$ 5.00 and CGPA < 5.50

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

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

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

18. **General Rules**

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

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

1. **All regulations as applicable for B.Tech Four year degree programme (Regular) will hold good for B.Tech (Lateral Entry Scheme) except for the following rules**

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

   b) A student should register for all 144 credits and secure all credits. The marks obtained in all 144 credits shall be considered for the calculation of the final CGPA.

   c) Students who fail to fulfil all the academic requirements for the award of the degree within six academic years from the year of their admission, shall forfeit their seat in B.Tech programme.

2. **Academic Requirements and Promotion Rules:**

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

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

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

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

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

I BTECH   I SEMESTER

Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
BS	GR17A1001	Linear Algebra and Single Variable Calculus	2	1		3	4	100
BS	GR17A1002	Advanced Calculus	2	1		3	4	100
BS	GR17A1007	Engineering Physics	2	1		3	4	100
ES	GR17A1009	Computer Programming	2	1		3	4	100
HS	GR17A1005	English	2	1		3	4	100
ES	GR17A1019	Fundamentals of Electronics Engineering	3	1		4	5	100
ES	GR17A1025	Engineering Workshop			2	2	4	75
ES	GR17A1027	Computer Programming lab			2	2	4	75
BS	GR17A1029	Engineering Physics lab			2	2	4	75
		TOTAL				24	37	825

Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
BS	GR17A1003	Transform Calculus and Fourier Series	2	1		3	4	100
BS	GR17A1004	Numerical Methods	2	1		3	4	100
BS	GR17A1008	Engineering Chemistry	2	1		3	4	100
ES	GR17A1010	Data Structures	2	1		3	4	100
ES	GR17A1023	Engineering Graphics	1		2	3	5	100
ES	GR17A1018	Basic Electrical Engineering	3	1		4	5	100
HS	GR17A1024	Business Communication and Soft Skills			2	2	4	75
ES	GR17A1026	IT Workshop			2	2	4	75
BS	GR17A1030	Engineering Chemistry lab			2	2	4	75
		TOTAL				24	38	825

II BTECH   I SEMESTER

Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
BS	GR17A2011	Probability and Statistics	2	1		3	4	100
PC	GR17A2062	Mathematical Foundation of Computer Science	3	1		4	5	100
PC	GR17A2063	Database Management Systems	3	1		4	5	100
PC	GR17A2064	Advanced Datastructures through C++	3	1		4	5	100
PC	GR17A2065	Digital Logic Design	3	1		4	5	100
PC	GR17A2066	Advanced Datastructures through C++ Lab			2	2	4	75
PC	GR17A2075	Database Manaement Systems Lab			2	2	4	75
PC	GR17A2053	Digital Electronics Lab			2	2	4	75
		Total credits/Hours/Marks				**24**	**36**	**725**
MC	GR17A2001	Environmental Science			2	2	4	100

II BTECH   **II SEMESTER**

Group	Subject code	Name of subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
HS	GR17A2104	Managerial Economics and Financial Analysis	2	1		3	4	100
PC	GR17A2069	Operating Systems	3	1		4	5	100
PC	GR17A2070	Object Oriented Programming through Java	3	1		4	5	100
PC	GR17A2077	Computer Networks	3	1		4	5	100
PC	GR17A2076	Computer Organization	3	1		4	5	100
PC	GR17A2072	Object Oriented Programming through Java Lab			2	2	4	75
PC	GR17A2078	Operating Systems and Computer Networks Lab			2	2	4	75
PC	GR17A2079	Web Designing Lab			2	2	4	75
		Total credits/Hours/Marks				**24**	**36**	**725**
MC	GR17A2002	Value Education and Ethics			2	2	2	100
MC	GR17A2106	Gender sensitization Lab			2	2	2	75

Group	Sub-Code	Name Of Subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
PC	GR17A3056	Design & Analysis of Algorithms	3	1		4	5	100
PC	GR17A3059	Web Technologies	2	1		3	5	100
PC	GR17A2055	Micro Controllers	3	1		4	5	100
Open Elective 2			**2**	**1**		**3**	**4**	**100**
Professional Elective 2			**3**	**1**		**4**	**5**	**100**
PE	GR17A3057	Software Engineering						
PE	GR17A3069	Computer Graphics						
PE	GR17A3053	Principles of Programming Languages						
PC	GR17A3063	Web Technologies Lab			2	2	4	75
PC	GR17A3100	Advanced English Communication Skills Lab			2	2	4	75
PC	GR17A2059	Micro Controllers Lab			2	2	4	75
		Total	**13**	**5**	**6**	**24**	**35**	**725**

Group	Sub-Code	Name Of Subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
PC	GR17A3103	Advanced Linux Programming	2	1		3	5	100
PC	GR17A3064	Automata and Compiler Design	3	1		4	5	100
PC	GR17A3065	Object Oriented Analysis and Design	3	1		4	5	100
Open Elective 1			**2**	**1**		**3**	**4**	**100**
Professional Elective 1			**3**	**1**		**4**	**5**	**100**
PE	GR17A3058	Information Security						
PE	GR17A3070	Embedded Systems						
PE	GR17A3068	Distributed Databases and Systems						
PC	GR17A3072	Advanced Linux Programming Lab			2	2	4	75
PC	GR17A3071	Compiler Design and Unified Modeling Language Lab			2	2	4	75
PC	GR17A3101	Industry Oriented Mini Project			2	2	4	75
		Total	**13**	**5**	**6**	**24**	**35**	**725**

IV BTECH   I SEMESTER

Group	Sub-Code	Name Of Subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
PC	GR17A3102	Management Science	3	1		4	5	100
PC	GR17A3060	Scripting Languages	2	1		3	5	100
PC	GR17A4104	Middleware Technologies	3	1		4	5	100
Open Elective 3			**2**	**1**		**3**	**4**	**100**
Professional Elective 3			**3**	**1**		**4**	**5**	**100**
PE	GR17A4077	Software Testing Methodologies						
PE	GR17A3061	Artificial Intelligence and Neural Networks						
PE	GR17A4094	Semantic Web and Social Networks						
PC	GR17A4084	Scripting Languages Lab			2	2	4	75
PC	GR17A4099	Middleware Technologies Lab			2	2	4	75
PC	GR17A4100	Animation Lab			2	2	4	75
Total			**13**	**5**	**6**	**24**	**36**	**725**

IV BTECH   II SEMESTER

Group	Sub-Code	Name Of Subject	Credits			Total credits	Total Hours	Total Marks
			L	T	P			
PC	GR17A4082	Mobile Application Development	2	1		3	4	100
Professional Elective 4			**3**	**1**		**4**	**5**	**100**
PE	GR17A4101	Software Project Management						
PE	GR17A4079	Cloud Computing						
PE	GR17A4091	E-Commerce						
Professional Elective 5			**2**	**1**		**3**	**4**	**100**
PE	GR17A4090	Design Patterns						
PE	GR17A4102	Adhoc Sensor Networks						
PE	GR17A4098	Network Programming						
PC	GR17A4105	Mobile Application Development Lab			2	2	4	75
SPW	GR17A4142	Comprehensive Viva Voce			1	1	2	50
SPW	GR17A4143	Seminar			1	1	2	100
SPW	GR17A4144	Major Project			10	10	14	200
Total			7	3	**14**	**24**	**35**	**725**

Open Elective 1		Course Title	Department Offering
OE - I	GR17A3151	Water Resources Engineering	CE
	GR17A3152	Solar & Wind Energy Systems	EEE
	GR17A3153	Applied Thermodynamics	ME
	GR17A3154	Principles of E- Commerce	CSE
	GR17A3155	Datamining and Applications	IT
	GR17A3156	Computer Architecture and Organization	ECE
Open Elective 2		Course Title	Department Offering
OE - II	GR17A3161	Transportation Engineering	CE
	GR17A3162	Sensors & Transducers	EEE
	GR17A3163	Automobile Engineering	ME
	GR17A3164	Human Computer Interaction	CSE
	GR17A3165	Essentials of Big Data Analytics	IT
	GR17A3166	Principles of Operating Systems	ECE
Open Elective 3		Course Title	Department Offering
OE - III	GR17A4161	Green Building Technology	CE
	GR17A4162	Soft Computing Techniques	EEE
	GR17A4163	Operations Research	ME
	GR17A4164	Mobile Computing and Applications	CSE
	GR17A4165	Business Intelligence	IT
	GR17A4166	Principles Of Satellite Communications	ECE

GOKARAJU RANGARAJUINSTITUTE OF ENGINEERING AND TECHNOLOGY
DESIGN AND ANALYSIS OF ALGORITHMS

Course Code: GR17A3056   **LTPC**
III Year I Semester   **3 104**

UNIT I
Introduction: Definition of an algorithm, properties of an Algorithm, performance analysis--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 find algorithms.

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 subsets problem, graph coloring, Hamiltonian cycles.

UNIT V
Branch and Bound: General method, applications, travelling sales person problem, 0/1 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

WEB TECHNOLOGIES

Course Code: GR17A3059 **LTPC**
III Year I Semester **2 103**

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, BDK Introspection, Using
Bound properties, Bean Info Interface, Constrained properties, Persistence, Customizes, Java
Beans API.

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

UNIT IV
Introduction to JSP: The Problem with Servlet, The Anatomy of a JSP Page, JSP Processing,
Generating Dynamic Content, Using Scripting Elements 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 – Specific Database Actions, Deploying JAVA Beans in a
JSP Page, Model View Controller Architecture, JSP Application Design with MVC setting up.
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.

MICROCONTROLLERS

Course Code: GR17A2055   **LTPC**
III Year I Semester   **3 1 04**

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 to microcontrollers, comparing microprocessors and microcontrollers, 4,8,16 and 32 bit microcontrollers, Development systems for Microcontrollers, **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 Data moves, Code Memory Read- only Data Moves, PUSH and POP Opcodes, 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, Incrementing and Decrementing, Addition, Subtraction, Multiplication and Division, Decimal Arithmetic, **Jump and Callopcodes:** Introduction, The jump and call program range, Jumps, Calls and Subroutines, call and returns, Interrupts and Returns

UNIT V

8051MicrocontrollerDesign: Introduction, Microcontroller specification, Microcontroller Design, Testing the Design, Timing subroutines, Serial Data Transmission.

Applications and Serial Data Communication: Keyboards, Displays, Pulse Measurement, D/A and A/D Conversions, Multiple interrupts, Serial data Communication.

TEXT BOOKS
1. D.V.Hall, Microprocssors and Interfacing, TMH,2nd edition 2006.
2. KennethJ.Ayala,The8051MicrocontrollerArchitectureProgrammingand Applications,2ndEdition,PenramInternationalPublishers(I),1996.

REFERENCES
1. A.K.Ray and K.M. Bjurchandani, TMH, 2nd edition, Advanced Microprocessors and Peripherals TMH, 2006
2. MohammedAriMazidiandJanciGillispie,The8051Microcontrollerand EmbeddedSystems,PearsonEducationAsia,NewDelhi,2003.

SOFTWARE ENGINEERING
(Professional Elective – I)

Course Code: GR17A3057   **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, User requirements, System requirements, Interface specification, the software requirements document.
Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

UNIT III

Design Engineering: Design process and Design quality, Design concepts, the Design model.
Creating an architectural design: Software architecture, Data design, Architectural Styles and Patterns, Architectural Design.
Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT IV

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.
Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.
Metrics for Process and Products: Software Measurement, Metrics for software quality.

UNIT V

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

Quality Management : Quality concepts, Software quality assurance, Software Reviews, 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.

COMPUTER GRAPHICS
(Professional Elective – I)

Course Code: GR17A3069　　　　　　　　　　　　　　　　**LTPC**

III Year I Semester　　　　　　　　　　　　　　　　　　**3　104**

UNIT I

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

Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms.

Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms

UNIT II

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

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

UNIT III

3D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

3-D object representation: Polygon surfaces, quadric surfaces, spline representation, 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 computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.
.

TEXT BOOKS

1.“ComputerGraphicsCversion”,DonaldHearnandM.PaulineBaker,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.
   PrinciplesofComputerGraphics,ShaliniGovil,Pai,2005,Springer.
5. Computer Graphics, Steven Harrington,TMH

PRINCIPLES OF PROGRAMMING LANGUAGE
(Professional Elective – I)

Course Code: GR17A3053   **L T PC**
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.

UNITIII
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

Course Code:GR17A3063	**LTPC**
III Year I Semester	**0022**

1. XML editor like Altova Xml-spy [www.Altova.com/XMLSpy 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

Login Page

This page looks like below:
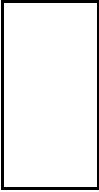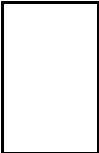
Logo	Web Site Name			
Home	**Login**	**Registration**	**Catalogue**	**Cart**
CSE **ECE** **EEE** **CIVIL**	User Name Password Sub ███ ███			

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.

Logo	Web Site Name			
Home	**Login**	**Registration**	**Catalogue**	**Cart**
CSE **ECE** **EEE** **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 : HTML in 24 hours Author : Sam Peter Publication : Sam	$ 50	

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

Task -2

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 **ECE** **EEE** **CIVIL**	**Book name**	**Price**	**Quantity**	**Amount**
	Java 2	$35.5	2	$70
	XML bible	$40.5	1	$40.5
			Total amount -	**$130.5**

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 (Cascading Style Sheets) 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">
```

```
.Hlink{cursor:help}
</style>
</head>
<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a><br>
<a href="mypage.htm" class="hlink">HELP LINK</a></b>
</body>
```

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.

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Course Code:GR17A3100   **LTPC**
III Year I Semester   **0 0 2 2**

Task-I

Functional English

Introduction to public speaking, analyzing and assimilating ideasrole play, formal and informal expressions and conversations.

Task-II

Vocabulary

Synonyms and Antonyms, Word Roots, One word substitutes, Prefixes and Suffixes, Idiomatic expressions and Phrasal verbs, Analogy.

Task- III

Group Discussion

Assimilation of ideas, analysis, sharing of ideas, initiation, leadership skill, team spirit and conclusion.

Task-IV

Presentation Skills

Scope, features, sources to be explored, role of non-verbal communication, audience perspective, feedback .

Task-V

Resume Writing and Letter Writing

Types and formats, tips to draft resume manual and emailing, types and formats for letter writing, content and body of the letter, email etiquette.

Task-VI

Interview Skills

Introduction, types of interviews, model questions and answering strategies, mock interviews, check list for preparing for an interview.

Task-VII

Reading comprehension

Types of reading, techniques qualities of a good reader.

Task-VIII

Report Writing

Introduction, importance, structure, formats and types of reports.

Reference Books:

1. Effective Technical Communication, M. Ashraf Rizvi, Tata McGraw Hill.
2. Business Communication; HorySankarMukerjee;OUP.
3. Business Communication; Meenakshi Raman, Praksh Sing; Oxfor
University Press.
4. English and Soft Skills; SP Dhanavel; Orient Black Swan.
5. Soft Skills for everyone; Jeff Butterfield; Cengage Learning.
6. Communication Skills;Viva Careers Skills Library.
7. Personality Development and Soft Skills; Barun K Mitra; Oxford University
Press.
8. English for Engineers Made Easy, AedaAbidi, Ritu Chaudhry, Cengage
Learning.
9. Communication Skills, Sanjay Kumar, PushpLatha, Oxford
Higher Education.
10. Professional Presentations; Malcom Goodale; Cambridge University Press.

MICRO CONTROLLERS LAB

Course Code:GR17A2059　　　　　　　　　　　　　　　　　　**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 string1 on first line of LCD,
   g)　SW2-Display string1 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 ZigBee from PC ZigBee dongle and display data on LEDs
   g)　Receive data on ZigBee from PC ZigBee dongle and display data on LCD
   h)　Read ADC and transmit data using ZigBee
   i)　i)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 Blue link,
  b) Receive data from PC using Blue link & 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 Blue link 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
  m) Implement data acquisition system and store data in a CSV file on SD card with time stamp

WATER RESOURCES ENGINEERING
(Open Elective-I)

Course Code: GR17A3151   **LT   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'MaysTataMC. GrawHill'
6. Introduction to Hydrology by Warren Viessman' Jr' Garyl' Lewis'
7. Handbook of Hydrology by David R. Maidment (Editour-in-chief)-McGrow - Hill

SOLAR AND WIND ENERGY SYSTEMS
(Open Elective- I)

Course Code: GR17A3152　　　　　　　　　　　　　　　　**LTPC**
III Year I Sem　　　　　　　　　　　　　　　　　　　　**2** 103

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

APPLIED THERMODYNAMICS
(Open Elective-I)

Course Code:GR17A3153   **LTPC**
III B. Tech I Semester   **2103**

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

PRINCIPLES OF E-COMMERCE
(OPEN ELECTIVE I)

Course Code: GR17A3154   **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.

DATA MINING AND APPLICATIONS
(Open Elective – I)

Course Code: GR17A3155   **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.

COMPUTER ARCHITECTURE AND ORGANIZATION
(Open Elective-1)

Course Code: GR17A3156   **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 Seque
ntialALUs, Carry look ahead adder, Robertson algorithm, booth's algorithm, non-
restoring division algorithm,Floating Point Arithmetic, Coprocessor, Pipeline Processing, Pipeline
desi gn, Modified booth's Algorithm

UNIT III
Control Design
Hardwired Control, Microprogrammed Control, Multiplier Control Unit, CPU Control Unit, Pipeline C
ontrol Instruction Pipelines, Pipeline Performance, Superscalar Processing, Nano Programming.

UNIT IV
Memory Organization
Random Access Memories, Serial Access Memories, RAM Interfaces, Magnetic Surface Recordi
ng,Optical Memories, multilevel memories, Cache & Virtual Memory, Memory Allocation, Associativ
e 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.

ADVANCED LINUX PROGRAMMING

Course Code: GR17A3103   **LTPC**
III Year II Semester   **2 103**

UNIT I

Utilities-Introduction to Linux file system, vi editor, file handling utilities, security by 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 and input 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 new process, 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 between processes 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.

UNIT-V

Message Queues-LINUX system V : Introduction to three types of IPC(system-V)-message queues, semaphores and shared memory. LINUX kernel support for messages, 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

AUTOMATA AND COMPILER DESIGN

Course Code: GR17A3064   **LTPC**
III Year II Semester   **3 104**

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, Loop optimization, 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.

OBJECT ORIENTED ANALYSIS AND DESIGN

Course Code: GR17A3065   **LTPC**
III Year II Semester   **3 104**

UNIT I
Introduction to UML: Importance of modeling, Principles of modeling, Object oriented 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, Activity Diagrams.

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 and Deployment 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.

INFORMATION SECURITY
(Professional Elective – II)

Course Code: GR17A3058   **L T P C**
III Year II Semester   **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: GR17A3070 LTPC
III Year II Semester 3104

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

ProgrammingConcepts 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.

DISTRIBUTED DATABASES AND SYSTEMS
(Professional Elective – II)

Course Code: GR17A3068 **LTPC**
III Year II Semester **3 104**

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.

UNIT III
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 verses distributed 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

Course Code:GR17A3072   **LTPC**
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: GR17A3071   **LTPC**
III Year II Semester   **0 0 22**

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: GR17A3161 **LTPC**
III Year   II Semester **2 1 03**

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.

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.

SENSORS AND TRANSDUCERS
(Open Elective – II)

Course Code: GR17A3162   **LTPC**
III Year II Sem   **2103**

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

Course code:GR17A3163   **LTPC**
III B. Tech II Semester   **2 1 03**

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: GR17A3164   **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.

Design process –Human interaction with computers, importance of human characteristics, human consideration, Human interaction speeds, Understanding business junctions.

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.

Develop System Menus and Navigation Schemes, -Select the proper kinds of Windows, -Select the proper Device based Controls, Choose the proper screen based controls.

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.

TECHNOLOGY ESSENTIALS OF BIG DATA ANALYTICS
(Open Elective – II)

Course Code: GR17A3165   **L T PC**
III Year II Semester   **2 1 0 3**

UNIT I
INTRODUCTION TO BIG DATA AND HADOOP

Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analysing Data with Unix tools, Analysing Data with Hadoop, Hadoop Streaming, Hadoop Echo System, IBM Big Data Strategy, Introduction to Infosphere BigInsights.

UNIT II

HDFS(Hadoop Distributed File System)

The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Data Ingest with Flume and Scoop and Hadoop archives, Hadoop I/O, Compression, Serialization, Avro and File-Based Data structures.

UNIT III

Map Reduce

Map Reduce programming Model, Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features. Introduction to Oozie. Overview of Managing job Execution Pig: Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Pig Latin : Structure, statements, Expressions, Types, Schemas, Functions and Macros. Pig User Defined Functions, Data Processing operators.

UNIT IV

Data Stores on Hadoop

Hive: Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions Hbase: HBasics, Concepts, Schemas, Loading Data, Web queries, Hbase Versus RDBMS. Introduction to Zookeeper

UNIT V

IBM 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.
2. Seema Acharya, SubhasiniChellappan, "Big Data Analytics" Wiley 2015

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, "BigDataAnalytics: Disruptive Technologies for Changing the Game", MC Press, 2012
10. Paul Zikopoulos ,Dirk DeRoos , 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: GR17A3166   **L   TPC**
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.

Course Code: GR17A3102 **LTPC**
IV Year I Semester **3 104**

UNIT I

Introduction to Management &Organization: Concepts of Management and Organization, 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 Inventory Control, 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 Evaluation and 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: GR17A3060   **LTPC**

IV Year I Semester   **2 1 03**

UNIT I

Introduction to Scripting: Scripts and Programs, Origin of Scripting, Scripting Today, 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, General Overview 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, PHP Authentication 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, PHP Encryption 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 language, 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.

MIDDLEWARE TECHNOLOGIES

Course Code: GR17A4104 **LTPC**
IV Year I Semester **3 104**
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

SOFTWARE TESTING METHODOLOGIES
(Professional Elective – III)

Course Code:GR17A4077   **LTPC**
IV Year I Semester   **3 104**

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 & path expression, 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:GR17A3061   **LTPC**
IV Year I Semester   **3 1 04**

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 Association Networks, 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.

Course Code: GR17A4094   **LTPC**
IV Year I Semester   **3 104**

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.

Course Code: GR17A4084   **LTPC**
IV Year I Semester   **0 022**

PHP
Task 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. Write a PHP script for the following: Design a form to accept the details of 5 different items, such as item code, item name, units sold, rate. Display the bill in the tabular format. Use only 4 text boxes. (Hint: Use of explode function.)

  f. Create a form to accept customer information (name, address, ph-no).Once the customer information is accepted, accept product information in the next form(Product name, qty, rate). Display the bill for the customer in the next form. Bill should contain the customer information and the information of the products entered.

Task 2

  a. Write a PHP script for the following: Design a form to accept two strings from the user. Find the first occurrence and the last occurrence of the small string in the large string. Also count the total number of occurrences of small string in the large string. Provide a text box to accept a string, which will replace the small string in the large string. (Use built-in functions)
  b. Write a menu driven program to perform the following operations on an associative array:
      i. Display the elements of an array along with the keys.
      ii. Display the size of an array
      iii. Delete an element from an array from the given index
      iv. Reverse the order of each element's key-value pair [Hint: use array_flip()]
      v. Traverse the elements in an array in random order [[Hint: use shuffle()].

Task 3

  a. Create a login form with a username and password. Once the user logs in, the second form should be displayed to accept user details (name, city, phoneno). If the user doesn't enter information within a specified time limit, expire his session and give a warning.
  b. Write a PHP script to store, retrieve and delete data using session variables.
  c. Write a PHP script to accept user name and password . If in the first three chances, username and password entered is correct, then display second form, otherwise display error message.

Task 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.

Task 5

Write a PHP script for the following: Design a form to accept a string. Write a function to count the total number of vowels (a,e,i,o,u) from the string. Show the occurrences of each vowel from the string. Check whether the given string is a palindrome or not, without using built-in function.(Use radio buttons and the concept of function. Use 'include' construct.)

Task 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.

Task 7

Write a PHP script that will demonstrate POSIX regular expressions for validating i)Name ii) Pin Code iii) Date iv)Email-id.

Task 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.

Task 9

Write a PHP script for the following: Design a form to accept two strings from the user. Find whether the small string appears at the start of the large string. Provide a text box to accept the string that will replace all occurrences of small string present in the large string. Also split the large string into separate words. (Use regular expressions).

PHYTHON

Task 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.

Task 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.
Task 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 reference).

TEXT BOOKS

1. Beginning.PHP.and.MySQL.3rd.Edition W. Jason Gilmore-Third Edition
Apress publications
2. Python-Standard Library by FrederikLuth- O'Relly
3. Practical Programming in Python by Jeffery Elkener

MIDDLEWARE TECHNOLOGIES LAB

Course Code: GR17A4099   **LTPC**
IV Year I Semester   **0 022**

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.

ANIMATIONS LAB

Course Code: GR17A4100   **LTPC**
IV Year I Semester   **0 022**

Week 1: An introduction of the various drawing and painting tools and their uses

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 traditional animation 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 head using 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 animation industry.

Week 14: Create a scene for animation using proper layout procedures.

GREEN BUILDING TECHNOLOGY
(Open Elective-III)

Course Code: GR17A4161   **LTP   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: GR17A4162   **L T P C**
IV Year I Semester   **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.

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.

Course Code: GR17A4163   **LTPC**
IV B. Tech I Semester   **21 03**
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

Course Code: GR17A4164   **LTPC**
IV Year I Semester   **21   03**

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.

BUSINESS INTELLIGENCE
(Open Elective – III)

Course Code:GR17A4165   **LTPC**
IV Year I Semester   **210   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

PRINCIPLES OF SATELLITE COMMUNICATIONS
(OPEN ELECTIVE-III)

Course Code: GR17A04166   **L T PC**
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

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.

MOBILE APPLICATION DEVELOPMENT

Course Code:GR17A4082   **LTPC**
IV Year II Semester   **2   103**

UNIT I

Java Concepts: OOPs Concepts, Inheritance in detail, Exception handling, Packages & interfaces, 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:** Basic Building blocks - Activities, Services, Broadcast Receivers & Content providers, UI Components - Views & notifications, 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: GR17A4101   **LTPC**
IV Year II Semester   **3104**

UNIT I

Conventional Software Management: The waterfall model, conventional software Management performance.
Evolution of Software Economics: Software Economics, pragmatic software cost estimation.
Improving Software Economics: Reducing Software product size, improving software 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, Engineering artifacts, 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.

CLOUD COMPUTING
(Professional Elective – IV)

Course Code: GR17A4079   **LTPC**
IV Year II Semester   **3104**

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

E-COMMERCE
(Professional Elective – IV)

Course Code: GR17A4091　　　　　　　　　　　　　　　　　**LTPC**
IV Year II Semester　　　　　　　　　　　　　　　　　　　**3　104**

UNIT I

Electronic Commerce- Framework, anatomy of E-Commerce applications, E- commerce Consumer applications, E-Commerce organization applications. Consumer Oriented Electronic commerce-Mercantile Process models.

UNIT II

Electronic payment systems-Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Inter Organizational Commerce-EDI,EDI Implementation, Value added networks.

UNIT III

Intra Organizational Commerce-work Flow, Automation Customization and internal Commerce, Supply chain Management.
CorporateDigitalLibrary-DocumentLibrary,digitalDocumenttypes,corporate
Data Warehouses.

UNITIV

Advertising and Marketing-Information based marketing, Advertising on Internet, on-line marketing process, market research.
ConsumerSearchandResourceDiscovery-InformationsearchandRetrieval, Commerce

Catalogues, Information Filtering.

UNIT V

Multimedia-key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing's, Desktop video conferencing.

TEXTBOOKS

1. Frontiers of electronic commerce–Kalakata,Whinston,Pearson.

REFERENCES

1. E-Commerce fundamentals and applications Hendry Chan,RaymondLee, TharamDillon,EllizabethChang,JohnWiley.

2. E-Commerce, S.Jaiswal–Galgotia.

3. E-Commerce, EfrainTurbon,Jae Lee, David King, H.Michael Chang.

4. Electronic Commerce–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: GR17A4090   **LTPC**
IV Year II Semester   **2 103**

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, Document Structure, 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.

AD-HOC SENSOR NETWORKS
(Professional Elective – V)

Course Code: GR17A4102   **LTPC**
IV Year II Semester   **2 103**

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: GR17A4098   **LTPC**
IV Year IISemester   **2 103**
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: GR17A4105   **LTPC**
IV Year II Semester   **00 22**

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