ACADEMIC REGULATIONS
PROGRAM STRUCTURE
and
DETAILED SYLLABUS

Master of Technology

(Software Engineering)

(Two Year Regular Programme)

(Applicable for Batches admitted from 2017)

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

ACADEMIC REGULATIONS

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

For all Postgraduate Programmes (M.Tech)
GR17 REGULATIONS

Gokaraju Rangaraju Institute of Engineering and Technology-2017 Regulations (GR 17 Regulations) are given hereunder. These regulations govern all the Post Graduate programmes offered by various departments of Engineering with effect from the students admitted to the programmes from 2017-18 academic year.

1. **Programme Offered:** The Post Graduate programme offered by the department is M.Tech, a two-year regular programme in that discipline.

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

3. **Admissions:** Admission into the M.Tech Programme in any discipline shall be made subject to the eligibility and qualifications prescribed by the University from time to time. Admissions shall be made either on the basis of the merit rank obtained by the student in PGCET conducted by the APSCHE for M. Tech Programmes or on the basis of any other order of merit approved by the University, subject to reservations as prescribed by the Government from time to time.

4. **Programme Pattern:**
   a) A student is introduced to "Choice Based Credit System (CBCS)" for which he/she has to register for the courses at the beginning of each semesters as per the procedure.
   b) Each Academic year of study is divided into two semesters.
   c) Minimum number of instruction days in each semester is 90.
   d) The total credits for the Programme is 88.
   e) Grade points, based on percentage of marks awarded for each course will form the basis for calculation of SGPA (Semester Grade Point Average) and CGPA (Cumulative Grade Point Average).
   f) A student has a choice of registering for credits from the courses offered in the programme.
   g) All the registered credits will be considered for the calculation of final CGPA.

5. **Award of M.Tech Degree:** A student will be declared eligible for the award of the M. Tech Degree if he/she fulfills the following academic requirements:
   a) A student shall be declared eligible for the award of M.Tech degree, if he/she pursues the course of study and completes it successfully in not less than two academic years and not more than four academic years.

b) A Student, who fails to fulfill all the academic requirements for the award of the degree within four academic years from the date of admission, shall forfeit his/her seat in M.Tech courses.

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

6. Attendance Requirements

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

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

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

d) 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 of the College from time to time.

b) The following is the division of marks between internal and external evaluations.

S.no	Particulars	Internal	External	Total
1	Theory	30	70	100
2	Practical	30	70	100
3	Comprehensive Viva	-	100	100
4	Seminar	30	70	100
5	Project work	30	70	100

c) The marks for internal evaluation per semester per theory course are divided as follows:

i. **Mid written examinations: 20 Marks**
ii. **Assignment: 5 Marks**
iii. **Continuous Assessment: 5 Marks**
iv. **Total: 30Marks**

d) **Mid-Term Written Examination:** There shall be two mid-term written examinations during a semester. The first mid-term written examination shall be conducted from the first 50 per cent of the syllabus and the second mid-term written examination shall be conducted from the remaining 50 per cent of the syllabus. The mid-term written examinations shall be evaluated for **20 marks** and average of the marks scored in the two mid-term written examinations shall be taken as the marks scored by each student in the mid-term written examination for that semester.

e) Assignment: Assignments are to be given to the students and marks not exceeding 5 (5%) per semester per paper are to be awarded by the teacher concerned.

f) For Internal Evaluation in Practical/Lab Subjects: The marks for internal evaluation are 30. Internal Evaluation is done by the teacher concerned with the help of the other staff member nominated by Head of the Department. Marks Distribution is as follows:

i.	**Writing the program/Procedure:**	**10 Marks**
ii.	**Executing the program/Procedure:**	**10 Marks**
iii.	**Viva:**	**05 Marks**
iv.	**Continuous Assessment:**	**05 Marks**
v.	**Total:**	**30Marks**

g) **For External Evaluation in Practical/Lab Subjects:** The Semester end examination shall be conducted by an external examiner and a staff member of the Department nominated by Head of the Department. Marks distribution is as follows:

i.	**Writing the program/Procedure:**	**20 Marks**
ii.	**Executing the program/Procedure:**	**20 Marks**
iii.	**Viva:**	**15 Marks**
iv.	**Lab Record:**	**15 Marks**
v.	**Total:**	**70 Marks**

h) Comprehensive Viva: There shall be a Comprehensive Viva-Voce in II year I semester. The Comprehensive Viva-Voce will be conducted by the committee consisting of Head of the Department and two senior faculty members of the Department. The Comprehensive Viva-Voce is aimed to assess the student's understanding in various subjects he/she studies during the M.Tech course of study. The Comprehensive Viva-Voce is valued for 100 marks by the committee. There are no internal marks for the Comprehensive Viva-voce.

i) Seminar: There shall be two Seminar Presentations by the student, one each in I and II semesters. For the seminar, the student shall collect the information on a specialized topic other than his/her project and prepare a technical report, showing his understanding over the topic, and submit to the department, which shall be evaluated by a Departmental committee consisting of the Head of the department, seminar Supervisor and a senior faculty member. **The seminar shall be evaluated for 100 marks. Internal evaluation is for 30 marks and external for 70 marks.**

j) Evaluation of Main Project Work: A Project Review Committee (PRC) is to be constituted by the Principal/Director with Head of the Department as the Chairman and two other senior faculty members of the department.

i. Registration for Project work: A candidate is permitted to register for the project work after satisfying the attendance requirements of all the courses (theory and practical courses) up to III Semester.

ii. After satisfying the registration requirements, a candidate is permitted to register for the project work after satisfying, the title, objectives and plan of action of his project work to the Project Review Committee for its approval. Only after obtaining the approval of Project Review Committee of the Department, the student can initiate the project work. Any changes thereafter in the project are to be approved by PRC. The student has to work under the guidance of both internal guide (one faculty member of the department) and external guide (from Industry not below the rank of an officer). Internal guide is allotted by the Head of the Department or Coordinator of the Project Work whereas external guide is allotted by the industrial organization in which the project is undertaken.

iii. The candidate shall submit status of the report in two stages at least with a gap of 20 days between them.

iv. The work on the project shall be initiated in the beginning of the fourth semester and the duration is one semester. A candidate is permitted to submit project report only after successful completion of theory and practical courses with the approval of PRC and not earlier than 40 days from the date of registration of the project work. For the approval of PRC the candidate shall submit the draft copy of the thesis to the Head/Coordinator (through internal research guide) and shall make an oral presentation before the PRC.

v. After approval from the PRC, the final thesis is to be submitted along with ANTI-PLAGIARISM report from the approved agency with a similarity index not more than 30%.

vi. Two hardcopies and one soft copy of the project work (dissertation) certified by the research supervisors shall be submitted to the College/Institute.

vii. The thesis shall be adjudicated by one external examiner selected by the Institute out of 5-member panel, submitted by the department.

viii. The marks allotted for project work review are 100, out of which30 are for internal and 70 for external. Internal evaluation marks are awarded by the PRC on the basis of the student's performance in the three pre-submission reviews and the external evaluation is done by the external examiner.

ix. The marks allotted for project work and dissertation are 100, out of which 30 are for internal and 70 for external. Internal evaluation marks are awarded by the PRC on the basis of the student's performance in the three pre-submission reviews and the external evaluation is done by the external examiner. In both internal and external evaluations the student shall score at least 40% marks and an aggregate of 50% marks to pass in the project work. If the report of the examiner is favourable, Viva-voce examination shall be conducted by a Board consisting of the Supervisor, Head and the External Examiner who adjudicated the project work.

The Board shall jointly evaluate the student's performance in the project work.

x. In case the student doesn't pass through the project work, he has to reappear for the viva-voce examination, as per the recommendations of the Board. If he fails succeed at the second Viva-voce examination also, he will not be eligible for the award of the degree, unless he is asked to revise and resubmit the Project by the Board. Head of the Department and Project coordinator shall coordinate and make arrangements for the conduct of viva-¬voce examination. When one does get the required minimum marks both in internal and external evaluations the candidate has to revise and resubmit the dissertation in the time frame prescribed by the PRC. If the report of the examiner is unfavourable again, the project shall be summarily rejected.

xi. If the report of the viva-voce is not satisfactory, the candidate will retake the viva-voce examination after three months. If he fails to get a satisfactory report at the second viva-voce examination, he will not be eligible for the award of the degree, unless the candidate is asked to revise and resubmit.

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 in an end semester examination can appear for a supplementary examination, as per the schedule announced by the College/Institute.
11. **Malpractices in Examinations:** Disciplinary action shall be taken in case of malpractices during Mid/ End-examinations as per the rules framed by the Academic Council.
12. **Academic Requirements**

a) A student shall be deemed to have secured the minimum academic requirement in a subject if he / she secures a minimum of 40% of marks in the Semester-end Examination and a minimum aggregate of 50% of the total marks in the Semester-end examination and Internal Evaluation taken together.

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

c) In order to qualify for the award of M.Tech Degree, the student shall complete the academic requirements of passing in all the Courses as per the course structure including Seminars and Project if any.

d) In case a Student does not secure the minimum academic requirement in any course, he/she has to reappear for the Semester-end Examination in the course, or re-register for the same course when next offered or re-register for any other specified course, as may be required. However, one more additional chance may be provided for each student, for improving the internal marks provided the internal marks secured by a student are less than 50% and he/she failed finally in the course concerned. In the event of taking another chance for re-registration, the internal marks obtained in the previous attempt are nullified.

In case of re-registration, the student has to pay the re-registration fee for each course, as specified by the college.

e) 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 (Above Average)	6	Marks>=50 and Marks < 60
F (Fail)	0	Marks < 50
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-B. 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 4) is the ratio of sum of the product of the number of credits and grade points to the total creditsof all courses registered by a student,

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

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

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

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

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

13. Award of Class: After a student satisfies all the requirements prescribed for the completion of the Degree and becomes eligible for the award of M. Tech Degree by JNTUH, he/she shall be placed in one of the following four classes:

	Class Awarded	CGPA Secured
3.1	First class with distinction	CGPA ≥ 7.75
3.2	First Class	CGPA ≥ 6.75 and CGPA < 7.75
3.3	Second Class	CGPA ≥ 6.00 and CGPA < 6.75

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

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

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

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

M.Tech (SE) **M.Tech (SE) PROGRAMME STRUCTURE** **I Year-I Semester**

Sub-Code	Group	Subject	L	T	P	C	Int	Ext	Total
GR17D5023	PC	Software Requirements and Estimation	3	1	0	4	30	70	100
GR17D5024	PC	Software Process & Project Management	3	1	0	4	30	70	100
GR17D5025	PC	Component Oriented Programming Languages	3	1	0	4	30	70	100
	OE-I	**Open Elective – I**	3	1	0	4	30	70	100
	Elective I		3	1	0	4	30	70	100
GR17D5026	PE	Data Mining and Applications							
GR17D5015	PE	Advanced Computer Networks							
GR17D5002	PE	Object Oriented Modeling							
	Elective II		3	1	0	4	30	70	100
GR17D5017	PE	Information Storage and Retrieval							
GR17D5004	PE	Distributed Databases							
GR17D5009	PE	Soft Computing							
GR17D5028	Lab	Component Oriented Programming Languages Lab	0	0	2	2	30	70	100
GR17D5173	SPW	Seminar – I	0	0	2	2	30	70	100
		Total	**18**	**6**	**4**	**28**	**240**	**560**	**800**

M.Tech (SE) **M.Tech (SE) PROGRAMME STRUCTURE** **I Year-II Semester**

Sub-Code	Group	Subject	L	T	P	C	Int	Ext	Total
GR17D5012	PC	Distributed Computing		1	0	4	30	70	100
GR17D5029	PC	Software Quality Assurance and Testing		1	0	4	30	70	100
GR17D5030	PC	Server side Scripting Languages		1	0	4	30	70	100
	OE-I	**Open Elective – I**	3	1	0	4	30	70	100
	Elective III		3	1	0	4	30	70	100
GR17D5021	PE	Service Oriented Architecture							
GR17D5007	PE	Software Architecture & Design Patterns							
GR17D5033	PE	Formal Methods in Software Engineering							
	Elective IV		3	1	0	4	30	70	100
GR17D5031	PE	Multimedia & Rich Internet Development							
GR17D5034	PE	Software Agents							
GR17D5008	PE	Image Processing & Pattern Recognition							
GR17D5035	Lab	Server Side Scripting Languages Lab	0	0	2	2	30	70	100
GR17D5174	SPW	Seminar – II	0	0	2	2	30	70	100
Total			18	6	4	28	240	560	800

II Year-I Semester

Sub-code	Group	Subject	L	T	P	C	Int	Ext	Total
GR17D5175	SPW	Comprehensive Viva-voce	-	-	-	4	0	100	100
GR17D5176	SPW	Project work Review	-	-	-	12	30	70	100
Total			-	-	-	16	30	170	200

II Year-II Semester

Sub- code	Group	Subject	L	T	P	C	Int	Ext	Total
GR17D5177	SPW	Project work and Dissertation	-	-	-	16	30	70	100
Total			-	-	-	16	30	70	100

A student has a choice to select one Open Elective Pool I in I Semester and one Open Elective Pool II in II Semester.

Open Elective Pool-I

Sub-code	Group	Subject	L	T	P	C	Int.	Ext.	Total
GR17D5178	OE-I	E- Commerce and Applications (CSE)	3	1	0	4	30	70	100
GR17D5179		Enterprise Resource Planning (IT)	3	1	0	4	30	70	100
GR17D5180		Modern Control Theory (EEE)	3	1	0	4	30	70	100
GR17D5181		Computer Oriented Numerical Methods in Engineering (CE)	3	1	0	4	30	70	100
GR17D5182		Advanced Computer Architecture (ECE)	3	1	0	4	30	70	100
GR17D5183		Operations Research (ME)	3	1	0	4	30	70	100

Open Elective Pool-II

Sub-Code	Group	Subject	L	T	P	C	Int	Ext	Total
GR17D5184	OE-II	Human Computer Interaction (CSE)	3	1	0	4	30	70	100
GR17D5185		Big Data and Analytics (IT)	3	1	0	4	30	70	100
GR17D5186		Neural and Fuzzy Systems (EEE)	3	1	0	4	30	70	100
GR17D5187		Project Management (CE)	3	1	0	4	30	70	100
GR17D5188		Hardware Software Co-Design(ECE)	3	1	0	4	30	70	100
GR17D5189		Non-Conventional Energy Resources(ME)	3	1	0	4	30	70	100

I- SEMESTER

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

SOFTWARE REQUIREMENTS AND ESTIMATION

M.Tech (Software Engineering) | I Year - I Semester
Course Code: GR17D5023 | L/T/P/C : 3/1/0/4

PREREQUISITES

- A Fundamental Software Engineering course.

COURSE OBJECTIVES: The objective of the course is to provide the student

- Understanding about good practices of requirements development and management and elements of risk management.
- Identification of various techniques for requirements modeling.
- Emphasis on various requirement gathering techniques and requirement prioritization models.
- Understanding about Change Control Process and manage requirements and requirement documents using various requirement management tools.
- Learning of various estimation methods for sizing of software.
- Understanding of various effort and schedule estimation techniques.
- Appraise about various automated tools for software estimation.

COURSE OUTCOMES: At the end of the course the student will be able to

- Identify and examine the good practices of requirement engineering
- Create various models for requirement modelling.
- Appraise various techniques of requirement gathering.
- Choose a requirement management tool.
- Apply various techniques for software size estimation.
- Discriminate various techniques of effort and schedule estimation.
- Identify and Select a tool for software estimation.

UNIT-I

Software Requirements: What and Why: Essential Software requirement, Good practices for requirements engineering, Improving requirements processes, Software requirements and risk management

UNIT-II

Software Requirements Engineering Requirements elicitation, requirements analysis documentation, review, elicitation techniques, analysis models, Software quality attributes, risk reduction through prototyping, setting requirements priorities, verifying requirements quality, Software Requirements Modeling- Use Case Modeling, Analysis Models, Dataflow diagram, state transition diagram, class diagrams, Object analysis, Problem Frames

UNIT-III

Software Requirements Management: Requirements management Principles and practices, Requirements attributes, Change Management Process, Requirements Traceability Matrix, Links in requirements chain Requirements Management Tools: Benefits of using a requirements management tool, commercial requirements management tool, Rational Requisite pro, Caliber – RM, implementing requirements management automation,

UNIT-IV

Software Estimation: Components of Software Estimations, Estimation methods, Problems associated with estimation, Key project factors that influence estimation. Size Estimation-Two views of sizing, Function Point Analysis, Mark II FPA, Full Function Points, LOC Estimation, Conversion between size measures, UNIT-V Effort, Schedule and Cost Estimation What is Productivity? Estimation Factors, Approaches to Effort and Schedule Estimation, COCOMO II, Putnam Estimation Model, Algorithmic models, Cost Estimation

Software Estimation Tools: Desirable features in software estimation tools, IFPUG, USC's COCOMO II, SLIM (Software Life Cycle Management) Tools

TEXT BOOKS

1. Software Requirements and Estimation by Rajesh Naik and Swapna Kishore, Tata Mc Graw Hill
2. Software Requirements by Karl E. Weigers,Microsoft Press.

REFERENCE BOOKS

1. Managing Software Requirements, Dean Leffingwell & Don Widrig, Pearson Education,2003.
2. Mastering the requirements process, second edition, Suzanne Robertson & James Robertson, Pearson Education, 2006.
3. Estimating Software Costs, Second edition, Capers Jones, Tata McGraw-Hill, 2007.
4. Practical Software Estimation, M.A. Parthasarathy, Pearson Education, 2007.
5. Measuring the software process, William A. Florac & Anita D. Carleton, Pearson Education,1999.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

SOFTWARE PROCESS AND PROJECT MANAGEMENT

M.Tech (Software Engineering) I Year - I Semester
Course Code: GR17D5024 L/T/P/C : 3/1/0/4

PREREQUISITES

- Software Engineering
- Software Project Management.

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Understanding about the fundamental principles of Software Project management & will also have a good knowledge of responsibilities of project manager and how to handle these.
- Knowledge about various principles of Software Process improvements and factors influencing software quality and productivity.
- Familiarity with the different methods and techniques used for project management activities.
- Understanding about the Project Management Body of Knowledge.
- To provide a framework that enables the manager to make reasonable estimates of Resource, cost & schedule.
- Awareness of the areas closely related to quality management which forms an integral part of the management task.
- Explanation various processes required to make effective use of the people involved with the project.

COURSE OUTCOMES: At the end of the course the student will be able to:

- Apply software engineering principles to develop a system.
- Develop a system or component and test them to ensure quality.
- Analyze a problem and identifies the requirements.
- Identify the various characteristics of a project and help in developing a new product or service.
- Identify the different estimating methods.
- Manage changes in the project and helps in improving quality of the project.
- Recognize the leadership and management activities , career development , performance management , leading and managing changes.

UNIT- I

Software Process Maturity: Software maturity Framework, Principles of Software Process Change, Software Process Assessment, Introduction to the Initial Process, the Repeatable Process, the Defined Process, the Managed Process, The Optimizing Process. [Book 1]

UNIT-II

Project management Framework: Introduction, Project life cycle and organization
Project Management Processes for a project, project Integration Management, project scope management [Book 2]

UNIT-III

Project planning: understanding the work, estimating, scheduling and resourcing, monitoring progress, Reporting Progress [Book 3]

UNIT-IV

Delivering Success: Managing quality, Managing risk, selling the project, Managing the stakeholders, Managing the change. [Book 3]

UNIT-V

Project Human Resource management: leadership and performance, Managing the team, the project manager [Book3]

TEXT BOOKS

1. Managing the Software Process,Watts S. Humphrey, Pearson Education,1999
2. A Guide to the Project Management Body of Knowledge, Project Management Institute, 2008.
3. Cadle, J., Yeates, D., Project Management for Information Systems, Prentice Hall, 2006.

REFERENCE BOOKS

1. An Introduction to the Team Software Process, Watts S. Humphrey, Pearson Education,2000
2. Process Improvement essentials, James R. Persse, O'Reilly,2006
3. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition,Tata Mc-Graw Hill,2006
4. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.
5. Head First PMP, Jennifer Greene & Andrew Stellman, O'Reilly,2007
6. Software Engineering Project Managent, Richard H. Thayer & Edward Yourdon, second edition, Wiley India, 2004.
7. Agile Project Management, Jim Highsmith, Pearson education, 2004.
8. Quality Software Project Management,R.F.Futrell ,D.F.Shafer,L.I.Shafer,Pearson.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPONENT ORIENTED PROGRAMMING LANGUAGES

M.Tech (Software Engineering) I Year - I Semester
Course Code: GR17D5025 L/T/P/C : 3/1/0/4

PREREQUISITES

- C# programming is very much based on C and C++ programming languages, so if you have basic understanding on C or C++ programming then it will be a easy to learn C# programming language.
- Download and Install the C# Compiler and IDE.

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Insights of the Internet programming and how to design and implement complete applications over the web.
- Covering the notions of Web servers and Web Application Servers
- Introduction about the Design Methodologies with concentration on Object-Oriented concepts, Client-Side Programming, Server-Side Programming
- Insight into Database Connectivity to web applications
- Analysis of Dynamic content to web applications, Programming the User Interface for the web applications.
- Usage of recent platforms used in developing web applications such as the .Net environment like C#
- Ablity to Query Data by Using LINQ

COURSE OUTCOMES: By the end of this course student should be able to

- Design and implement C# application using Object oriented programming concepts.
- Understand, analyze and use basic C# constructs, delegates and events
- Design and implement server-side software that interacts with a database for the purposes of performing insert, update, and delete operations on the database; test and debug the software; deploy the software.
- Design and implement server-side software that interacts with a database for the purposes of querying the database; test and debug the software; deploy the software.
- Use the development products of Microsoft Visual Studio.Net® products to implement and connect the automated system to a database stored on a web server.
- Learn how to link and publish Visual Studio.Net® applications to reflect a web application.
- Understand, analyze and exposed to the Common Language Runtime (CLR), Garbage Collection and assemblies.

UNIT-I

Introduction To C# : Introducing C#, Understanding .NET, Features of .Net, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

UNIT-II

Object Oriented Aspects Of C# : Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions

UNIT-III

Application Development On .NET: Building Windows Applications, Web browser controls, Accessing Data with ADO.NET.

UNIT-IV

ADO.NET- LINQ : History and background, From DAO to ADO.NET, ADO.NET LINQ, ADO.NET design goals, The ADO.NET architecture and its components, ADO.NET in relation to the other .NET tools (Windows azure)

UNIT-V

Web Based Application Development On .NET: Programming Web Applications with Web Forms, Windows forms library – WinForms, Layout Enhancements, Forms and controls – Hierarchy, Creating simple GUI by hand, Event handling, Basic controls, Windows forms – buttons, check boxes, radio buttons, panels, group boxes, list boxes, picture boxes, Programming Web Services.

TEXTBOOKS

1. E.Balaguruswamy, “Programming in C#”,Tata Mc Graw Hill, 2004
2. J. Liberty, "Programming C#", 2nd ed., O'Reilly, 2002. 3.Jennifer Greene, Andrew StellmanO'Reilly MediaHead First C#, 3rd Edition

REFERENCE BOOKS

1. Herbert Schildt, "The Complete Reference: C#", Tata McGraw-Hill, 2004.
2. Robinson et al, "Professional C#", 2nd ed., Wrox Press, 2002.
3. Andrew Troelsen, "C# and the .NET Platform", A! Press, 2003.
4. S. Thamarai Selvi, R. Murugesan, "A Textbook on C#", Pearson Education, 2003

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

DATA MINING AND APPLICATIONS
(Elective –I)

M.Tech (Software Engineering) I Year - I Semester

Course Code: GR17D5026 L/T/P/C : 3/1/0/4

PREREQUISITES

- Fundamentals of databases
- Fundamentals of Data warehousing

COURSE OBJECTIVES: The objective of the course is to provide the student

- Capability to examine the types of data to be mined and present a general classification of tasks and primitives to integrate a data mining system.
- Ability to apply preprocessing statistical methods for any given data.
- Discovery of interesting patterns from large amounts of data to analyze and extract patterns to solve problems.
- Evaluate systematically supervised and unsupervised models and algorithms with respect to accuracy.
- Understanding about a wide range of clustering, classification and association algorithms problems.

COURSE OUTCOMES: At the end of the course the student will be able to

- Comprehend the roles that data mining plays in various fields and manipulate different data mining techniques.
- Gain knowledge for selecting and applying proper data mining algorithms to build analytical applications.
- Design hypotheses based on analysis to conceptualize a data mining solution for complex types of data.
- Apply the techniques of clustering, classification, association finding, feature selection and visualization to real world data.
- Gain knowledge in modelling temporal events.
- Analyze and solve various problems in mining data streams.
- Design and create new methodologies for solving the problems related to decision making with spatial data.

UNIT-I

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems,Data Mining Primitives Major issues in Data Mining. (TextBook 1)
Data Mining Versus Knowledge Discovery in Databases, Data Mining from Database Perspective, Statistical measures for Data Mining (TextBook 2)

UNIT-II

Mining Association Rules in Large Databases: Frequent Patterns, Efficient and scalable frequent itemset mining methods, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases, From Association Mining to Correlation Analysis, Constraint-Based Association Mining, Parallel and Distributed Algorithms, (TextBook 1, 2).

UNIT-III

Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Backpropagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy.(TextBook 1, 2)

Cluster Analysis Introduction: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis. (TextBook 1, 2)

UNIT-IV

Web Mining: Introduction to web mining techniques, Web content mining, Web Structure Mining (TextBook 2)

Spatial Mining: Introduction, Spatial data overview, Spatial data mining primitives, Spatial rules, Spatial classification algorithms like ID3 extension and Spatial decision tree, Spatial Clustering using CLARANS, DBCLASD, WaveCluster and approximation. (TextBook 2)

UNIT-V

Temporal Mining: Introduction, Modeling temporal events, Pattern detection, Temporal association rules. (TextBook 2)

Mining Complex Types of Data: Mining Data Streams, Mining Time-Series data,Mining Sequence Patterns in transactional databases. (TextBook 1)

TEXT BOOKS

1. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELINE KAMBER Harcourt India.
2. Data Mining – Introductory and advanced topics – Margaret H. Dunham &S.Sridhar, Pearson Education.

REFERENCE BOOKS

1. Data Mining Techniques – ARUN K PUJARI, University Press.
2. Adriaans, "Data Mining", Pearson Education.
3. K.P. Soman, ShyamDiwakar and V. Ajay “Insight into Data mining Theory andPractice”, Easter Economy Edition, Prentice Hall of India, 2006.
4. G. K. Gupta “Introduction to Data Mining with Case Studies”, Easter EconomyEdition, Prentice Hall of India, 2006

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ADVANCED COMPUTER NETWORKS (Elective-I)

M.Tech (Software Engineering) I Year - I Semester
Course Code: GR17D5015 L/T/P/C : 3/1/0/4

PREREQUISITES

- Computer Networks

COURSE OBJECTIVES: The objective of the course is to provide the student

- Understanding about the Network Technologies and to know the differences between wired and wireless technologies.
- Analysis of different types of Wireless Networks such as Wireless LANs, MANs, WANs with different transmission technologies
- Knowledge about the IP Addressing Schemes and Routing Protocols at Network Layer
- To differentiate between Unicasting, Broadcasting and Multicasting at Intra-domain or Inter-domain level
- Visualization of the difference between Cellular Network and Mobile Ad hoc Networks
- Clear idea about Optical Networks and how to allocate wavelengths in Optical Networks
- Capability to distinguish between Ad hoc Networks and Wireless Sensor Networks

COURSE OUTCOMES: At the end of the course the student will be able to:

- find the difference, advantages, disadvantages between Wired and Wireless Networking Technology.
- Set-up a LAN, MAN, WAN, with different transmission technologies
- Set-up IP addresses in different systems and to practically realize the path of routing.
- Differentiate between Uni-casting, Broadcasting and Multicasting and develop the routing protocols.
- Implement virtual Cellular communication and Ad hoc communication and measure the performance of the network using Network Simulators.
- Demonstrate the Optical Network and explain the features of Optical Network
- Set up a Wireless Sensor Network and Simulate the performance of WSN

UNIT-I

Computer Networks and the Internet: What is the Internet, The Network edge, The Network core, Access Networks and Physical media, ISPs and Internet Backbones, Delay and Loss in Packet-Switched Networks, History of Computer Networking and the Internet, Foundation of Networking Protocols: 5-layer TCP/IP model, 7-layer OSI model, Internet Protocols and addressing, Equal-sized Packets model: ATM, Networking Devices:Multiplexers, Modems and Internet Access Devices, Switching and Routing Devices, Router Structure.

UNIT-II

The Link Layer and Local Area Networks: Introduction and Services, Error-Detection and Error-Correction techniques, Multiple access protocols, Link layer addressing, Ethernet, Interconnections: Hubs and Switches, The Point-to-Point protocol(PPP), Link Virtualization, Routing and Internetworking: Network layer routing, Least-cost-Path algorithms, Non-least-cost-path algorithms

UNIT-III

Logical Addressing: IPv4 addressing, IPv6 addressing Internet Protocol: Internetworking, IPv4, IPv6,Transition from IPv4 to IPv6, Multicasting Techniques and Protocols: Basic definitions and techniques, Intra-domain multicast protocols, Inter-domain multicast protocols, Node-level multicast algorithms, Transport and end-to-end protocols: Transport layer, TCP, UDP, Mobile Transport Protocol, TCP Congestion control Application Layer: Principles of Network applications, the web and HTTP, File transfer:FTP, Electronic Mail in the Internet. DNS, P2P File sharing, Socket programming with TCP and UDP, Building a Simple Web-server.

UNIT-IV

Wireless Networks and Mobile IP: Infrastructure of wireless Networks, Wireless LAN technologies, IEEE 802.11 wireless standard, Cellular Networks, Mobile IP, Wireless mesh networks (WMNs). Optical Networks and WDM Systems: Overview of Optical Networks, Basic optical networking devics, Large-Scale Optical Switches, Optical Router, Wavelength Allocation in Networks, Case study- An all Optical switch.

UNIT-V

VPNs, Tunneling and Overlay Networks: Virtual Private Netwoks (VPNs), Multiportocol Label switching (MPLS), Overlay Networks, VoIP and Multimedia Networking: Overview of IP Telephony, VoIP Signaling Protocols, Real-time transport protocols, Distributed multimedia networking, Stream control Transmission protocol, Mobile Ad-Hoc Networks: Overview of wireless Ad-Hoc Networks, Routing in Ad-Hoc Networks, Routing protocols for Ad-Hoc Networks. Wireless sensor networks: Sensor Networks and Protocol structures, Communication Energy Model, Clustering Protocols, Routing Protocols.

TEXTBOOKS

1. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kuros, Third Edition, Pearson Education, 2007.
2. Computer and Communication Networks, Nader F Mir, Pearson Education, 2007

REFERENCE BOOKS

1. Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition, Tata McGrawhill.
2. An Engineering Approach to Computer Networking, S. Keshave, Pearson Education
3. Computer Networks, Andrew S. Tanenbaum, Fourth Edition, PEARSON, Prentice Hall

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

OBJECT ORIENTED MODELING
(Elective-I)

M.Tech (Software Engineering) I Year - I Semester

Course Code: GR17D5002 L/T/P/C : 3/1/0/4

PREREQUISITES

- Fundamentals of Object models.
- Fundamentals of Architectural Phase.

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Requirements model using UML class notations and use-cases based on statements of user requirements.
- Capability to Analyze requirements models given to them for correctness and quality.
- Create the OO design of a system from the requirements model in terms of a high-level architecture description.
- Capability to low-level models of structural organization and dynamic behaviour using UML class, object, and sequence diagrams.
- Understanding on how to create software the implements the OO designs modelled using UML.
- Comprehending the nature of design patterns by understanding a small number of examples from different patterns , and to be able to apply these patterns in creating an OO design.
- Knowledge about OO design heuristics evaluate a design for applicability, reasonableness, and relation to other design criteria.

COURSE OUTCOMES: At the end of the course the student will be able to:

- Apply in problem solving skills, best practices and standards to the industry
- Understand the classes, objects, use cases, Interactions, Activity, deployment, components and develop the those diagrams by using case tools
- Participate in team work while developing the models for case studies and testing tools.
- Analyze and model requirements and constraints for the purpose of designing and implementing software systems.
- Analyze and evaluate algorithms, designs, Implementations of the computing algorithms
- Design, conduct and evaluate the results of Experiments and testing activity
- Comprehend important issues related to the development of computer-based systems in a professional context using a well-defined process to guide development.

UNIT-I

UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture.

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams. Collaboration Diagrams& Sequence Diagrams.
Basic Behavioral Modeling: Use cases, Use case Diagrams, Activity Diagrams. Advanced
Behavioral Modeling: state chart diagrams.
Architectural Modeling: Component diagrams and Deployment diagrams.

UNIT-II

The Unified Process: use case driven, architecture centric, iterative, and incremental The Four Ps: people, project, product, and process.
Use case driven Process: why use case, capturing use cases, analysis, design, and implementation to realize the use cases, testing the use cases.

UNIT-III

Architecture-centric Process: architecture in brief, why we need architecture, use cases and architecture, the steps to architecture, an architecture description.
Iterative Incremental Process: iterative incremental in brief, why iterative incremental development? The iterative approach is risk driven, the generic iteration.

UNIT-IV

The Generic Iteration workflow: phases are the first division workflow, planning proceeds doing, risks affect project planning, use case prioritization, resource needed, assess the iteration and phases.
Inception Phase: early in the inception phase, the archetypal inception iteration workflow, execute the core workflows, requirements to test.

UNIT-V

Elaboration Phase: elaboration phase in brief, early in the elaboration phase, the architectural elaboration iteration workflow, execute the core work flows- Requirements to test.
Construction Phase: early in the construction phase, the archetypal construction iteration workflow, execute the core workflow.
Transition Phase: early in the transition phase, activities in transition phase.

TEXT BOOKS

1. The Unified Modeling Language User Guide By Grady Booch, James Rumbaugh, Ivar Jacobson 2nd Edition, Pearson Education.
2. UML 2 Toolkit By Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado WILEY-Dreamtech India Pvt. Ltd.
3. The Unified Software Development Process By Ivar Jacobson, Grady Booch, James Rumbaugh, Pearson Education

REFERENCE BOOKS

1. Fundamentals of Object Oriented Design in UML By Meilir Page-Jones, Pearson Education
2. Object Oriented Analysis & Design By Atul Kahate, The McGraw-Hill.
3. Practical Object-Oriented Design with UML By Mark Priestley, TATA McGrawHill
4. Object Oriented Analysis & Design By Brett D McLaughlin, Gary Pollice and David West, O'REILY .
5. Object-Oriented Analysis and Design using UML By Simon Bennet, Steve McRobb and Ray Farmer, 2nd Edition, TATA McGrawHill.
6. Object-Oriented Analysis and Design with the Unified Process By John W. Satzinger, Robert B Jackson and Stephen D Burd, THOMSON Course Technology.
7. UML and C++,R.C.Lee, and W.M.Tepfenhart,PHI

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

INFORMATION STORAGE AND RETRIEVAL (Elective-II)

M.Tech (Software Engineering) | I Year - I Semester
Course Code: GR17D5017 | L/T/P/C : 3/1/0/4

PREREQUISITES

- Basic understanding of problem solving, design and analysis of algorithms and computer programming.
- Basic Knowledge of Data Mining

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Knowledge to design the Data Mining Techniques.
- Capability to build the Relationship to DBMS.
- Knowledge to build the Digital Libraries and Data Warehouses.
- Introduction to Cataloging and Indexing.
- Insight into Indexing and auto Indexing algorithms using Data Structures.
- Knowledge about Text Searching Techniques for Clustering.
- Design concepts of the Multimedia models for data Modeling.

COURSE OUTCOMES: At the end of the course the student will be able to

- Apply the Knowledge and implement the techniques.
- Develop the relationship for DBMS.
- Ability to develop the Digital Libraries and Data werehouses.
- Build the Techniques for Data mining.
- Apply the knowledge and develop the Data mining algorithms using Data Structures.
- Ability to do the techniques for text searching and clustering.
- Build the Multimedia Models for Data Mining.

UNIT-I

Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses, Information Retrieval System Capabilities - Search, Browse, Miscellaneous.

UNIT-II

Cataloging and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction

Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure

Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages

UNIT-III

Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters

User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext

Information Visualization: Introduction, Cognition and perception, Information visualization technologies.

UNIT-IV

Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems.

Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

UNIT-V

Multimedia Information Retrieval: Models and Languages – Data Modeling, Query Languages, Indexing and Searching Libraries and Bibliographical Systems: Online IR Systems, OPACs, Digital Libraries.

TEXT BOOKS

1. Information Storage and Retrieval Systems: Theory and Implementation By Kowalski, Gerald, Mark T Maybury Kluwer Academic Press, 2000.
2. Modern Information Retrival By Ricardo Baeza-Yates, Pearson Education, 2007.
3. Information Retrieval: Algorithms and Heuristics By David A Grossman and Ophir Frieder, 2nd Edition, Springer International Edition, 2004.

REFERENCE BOOKS

1. Information Retrieval Data Structures and Algorithms By William B Frakes, Ricardo Baeza-Yates, Pearson Education, 1992.
2. Information Storage & Retieval By Robert Korfhage – John Wiley & Sons.
3. Introduction to Information Retrieval By Christopher D. Manning and Prabhakar Raghavan, CambridgeUniversity Press, 2008.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

DISTRIBUTED DATABASES
(Elective-II)

M.Tech (Software Engineering) I Year - I Semester

Course Code: GR17D5004 L/T/P/C : 3/1/0/4

PREREQUISITES

- Basic understanding of Relational Database systems.
- Basic understanding of Computer Networks

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Ability to understand the difference between centralized and distributed systems.
- Ability to analyze the key characteristics of distributed databases.
- Understanding about the architecture of Distributed databases.
- Transactional aspect of the distributed environment.
- Understanding about the Reliability aspect.
- Introduction to the object oriented distributed environment.
- Ability to understand database integration aspect.

COURSE OUTCOMES: At the end of the course the student will be able to:

- Demonstrate a view of the Distributed Database environment
- Applicability to solve the fragment queries
- Capable of understanding the architecture of the distributed database environment.
- Define of the Transaction and the Concurrency issues
- Analyse the reliability of the Distributed Database
- Understand the outline of the object databases
- Understand data integration issues

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, Integrity Constraints in Distributed Databases, Distributed Database Design

UNIT-II

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. Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries

UNIT-III

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-IV

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, Catalog Management in Distributed Databases, Authorization and Protection.

UNIT-V

Architectural Issues, Alternative Client/Server Architectures, Cache Consistency, Object Management, Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, Query Execution, Transaction Management, Transaction Management in Object DBMSs, Transactions as Objects.

Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues Transaction Management Transaction and Computation Model, Multidatabase Concurrency Control, Multidatabase Recovery, Object Orientation and Interoperability, Object Management Architecture CORBA and Database interoperability, Distributed Component Object Model, COM/OLE and Database Interoperability, PUSH-Based Technologies

TEXT BOOKS

1. Distributed Databases Principles & Systems, Stefano Ceri, Giuseppe Pelagatti,TMH.
2. Principles of Distributed Database Systems, M. Tamer Ozsu, Patrick Valduriez , Pearson Education, 2nd Edition.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

SOFT COMPUTING
(Elective-II)

M.Tech (Software Engineering) I Year - I Semester

Course Code: GR17D5009 L/T/P/C : 3/1/0/4

PREREQUISITES

- Basic understanding of problem solving, design and analysis of algorithms and computer programming.
- Basic Knowledge of Artificial Intelligence

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Introduction to soft computing concepts and techniques and foster their abilities in designing and implementing soft computing based solutions for real-world and engineering problems
- Explanation about fuzzy sets and its operations.
- Introduction to fuzzy systems, fuzzy logic and its applications.
- Introduction to genetic algorithms fundamentals
- Explanation about Artificial neural networks and its categories
- Explanation about the different hybrid systems like neuro modelling systems
- To comprehend the world energy situation

COURSE OUTCOMES: At the end of the course the student will be able to:

- Implement numerical methods in soft computing
- Explain the fuzzy set theory
- Apply derivative based and derivative free optimization
- Discuss the neural networks and supervised and unsupervised learning networks
- Comprehend neuro fuzzy modeling
- Demonstrate some applications of computational intelligence
- Recognize the feasibility of applying a soft computing methodology for a particular problem

UNIT-I

I**ntroduction to Soft Computing and Neural Networks:** Evolution of Computing, Soft Computing Constituents, From Conventional AI to Computational Intelligence, Machine Learning Basics.

UNIT-II

Genetic Algorithms: Introduction to Genetic Algorithms (GA), Applications of GA in Machine Learning, Machine Learning Approach to Knowledge Acquisition.

UNIT-III

Neural Networks: Machine Learning Using Neural Network, Adaptive Networks, Feed forward Networks, Supervised Learning Neural Networks, Radial Basis Function Networks, Reinforcement Learning, Unsupervised Learning Neural Networks, Adaptive Resonance architectures, Advances in Neural networks.

UNIT-IV

Fuzzy Logic: Fuzzy Sets, Operations on Fuzzy Sets, Fuzzy Relations, Membership Functions, Fuzzy Rules and Fuzzy Reasoning, Fuzzy Inference Systems, Fuzzy Expert Systems, Fuzzy Decision Making.

UNIT-V

Neuro-Fuzzy Modeling: Aaptive Neuro, Fuzzy Inference Systems, Coactive Neuro-Fuzzy Modeling, Classification and Regression Trees, Data Clustering Algorithms, Rulebase Structure Identification, Neuro-Fuzzy Control, Case studies.

TEXT BOOKS

1. Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, "Neuro-Fuzzy and Soft Computing", Prentice-Hall of India, 2003.
2. George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications",Prentice Hall, 1995.
3. James A. Freeman and David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques", Pearson Edn., 2003.

REFERENCE BOOKS

1. Mitchell Melanie, "An Introduction to Genetic Algorithm", Prentice Hall, 1998.
2. David E. Goldberg, "Genetic Algorithms in Search, Optimization and Machine Learning", Addison Wesley, 1997.
3. S. N. Sivanandam, S. Sumathi and S. N. Deepa, "Introduction to FuzzyLogic using MATLAB", Springer, 2007.
4. S.N.Sivanandam S.N.Deepa, " Introduction to Genetic Algorithms", Springer, 2007.
5. Jacek M. Zurada, "Introduction to Artificial Neural Systems", PWS Publishers, 1992.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPONENT ORIENTED PROGRAMMING LANGUAGES LAB

M.Tech (Software Engineering) | I Year - I Semester
Course Code: GR17D5028 | L/T/P/C : 0/0/4/2

PREREQUISITES

- C# programming is very much based on C and C++ programming languages, so if you have basic understanding on C or C++ programming then it will be a easy to learn C# programming language.
- Download and Install the C# Compiler and IDE.

COURSE OBJECTIVES: The objective of the course is to provide the student

- Design, document, code and test small C# console and GUI applications.
- Use the Visual Studio IDE to create and debug application and class library solutions and projects.
- Use collections to aggregate data, and use Generics to implement type-safe collection classes, structures, interfaces, and methods.
- Create and use new types (enumerations, classes, and structures), and understand the differences between reference types and value types.
- Catch, handle and throw exceptions.
- Query in-memory data by using LINQ.
- Creating web applications using Web Forms and Windows based applications.

COURSE OUTCOMES: By the end of this course student should be able to:

- Understand programming language concepts, particularly C# and object-oriented concepts
- Write, debug, and document well-structured .NET applications
- Understand the behavior of primitive data types, object references, and arrays
- Effectively create and use objects from class libraries
- Understand, analyze and use basic C# constructs, delegates and events
- Design and implement server-side software that interacts with a database for the purposes of performing insert, update, and delete operations on the database; test and debug the software; deploy the software.
- Learn how to link and publish Visual Studio.Net® applications to reflect a web application.

1. Program to display the addition, subtraction, multiplication and division of two number using console applications.
2. Simple application using web controls
   a) Finding factorial Value
   B) Money Conversion

c) Quadratic Equation
d) Temperature Conversion
e) Login control

3. Program to display the first 10 natural numbers and their sum using console application.
4. Program in C# to demonstrate Boxing and unBoxing.
5. Program to find the sum of all the elements present in a jagged array of 3 inner arrays.
6. Program to display the addition using the windows application.
7. Write a program to convert input string from lower to upper and upper to lower case.
8. Write a Program to illustrate the use of different properties in C#.
9. Implement Linked Lists in C# using the existing collections name space.
10. Write a program to simple calculator using windows application.
11. Write a program for Treeview control
    a) Treeview control and datalist
    b) Treeview operations
12. Write a program for Validation controls
13. Write a program to connectivity with Oracle database.
14. Write a program to access data source through ADO.NET.
15. Write a program to manage the session.

TEXT BOOKS

1. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2004.
2. J. Liberty, "Programming C#", 2nd ed., O'Reilly, 2002. 3.Jennifer Greene, Andrew StellmanO'Reilly MediaHead First C#, 3rd Edition

REFERENCE BOOKS

1. Herbert Schildt, "The Complete Reference: C#", Tata McGraw-Hill, 2004.
2. Robinson et al, "Professional C#", 2nd ed., Wrox Press, 2002.
3. Andrew Troelsen, "C# and the .NET Platform", A! Press, 2003.
4. S. Thamarai Selvi, R. Murugesan, "A Textbook on C#", Pearson Education, 2003

OPEN ELECTIVE - I

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

E - COMMERCE AND APPLICATIONS
(Open Elective I)

M.Tech (CSE) I Year - I Semester

Course Code: GR17D5178 L/T/P/C : 3/1/0/4

Course Objectives

- To understand the interest and opportunity of e-commerce
- To know and understand the critical success factors in implementing an ecommerce
- System
- To know how to plan and how to manage e-commerce solutions
- To have hands on, real-life experience with electronic commerce applications
- To analyze and understand the human, technological and business environment
- Associated with e-commerce

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

- Understand the trends in e-Commerce and the use of the Internet.(Level 2)
- Analyze, Understand and Comparethe principles of E-commerce and basics of World Wide Web.(Level 2&4)
- Analyze, Understandthe concept of electronic data interchange and its legal, social and technical aspects.(Level 2&4)
- Understandand Evaluate the security issues ssssover the web, the available solutions and future aspects of e-commerce security .(Level 2&5)
- Understanding and Validating the concept of E-banking, electronic payment system.(Level 2&5)
- Understand, Analyze and Comparethe capabilities and limitation of agents, Web based marketing and various security Issues. (Level 2&4)
- Understandingand Evaluation of online advertisements, website design issues and Creating a business transaction using an e commerce site.(Level 2,5 &6)

UNIT-I

INTRODUCTION Traditional commerce and E commerce – Internet and WWW – role of WWW – value chains – strategic business and Industry value chains – role of E commerce, advantages of E commerce, anatomy of e commerce applications.

UNIT-II

INFRASTRUCTURE FOR E COMMERCE Packet switched networks – TCP/IP protocol script – Internet utility programmes – SGML, HTML and XML – web client and servers – Web client/server architecture – intranet and extranets.

UNIT-III

WEB BASED TOOLS FOR E COMMERCE Web server – performance evaluation - web server software feature sets – web server software and tools – web protocol – search engines – intelligent agents –EC software – web hosting – cost analysis

UNIT- IV

SECURITY Computer security classification – copy right and Intellectual property – electronic commerce threats – protecting client computers – electronic payment systems and risks involved in it –electronic cash __ micro payment system– strategies for marketing – sales and promotion – cryptography –authentication.

UNIT-V

INTELLIGENT AGENTS Definition and capabilities – limitation of agents – security – web based marketing – search engines and Directory registration – online advertisements – Portables and info mechanics – website design issues.

TEXT BOOKS

1. Ravi Kalakota, " Electronic Commerce", Pearson Education,
2. Gary P Schneider "Electronic commerce", Thomson learning & James T Peny Cambridge USA, 2001.

REFERENCES BOOK

1. EfraimTurvanJ.Lee, David kug and chung, "Electronic commerce" Pearson Education Asia 2001.
2. Brenda Kienew E commerce Business Prentice Hall, 2001.
3. Manlyn Greenstein and Miklos "Electronic commerce" McGraw-Hill, 2002.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ENTERPRISE RESOURCE PLANNING
(Open Elective-I)

M.Tech (IT) I Year - I Semester

Course Code: GR17D5179 L/T/P/C : 3/1/0/4

PREREQUISITES

- Fundamentals of enterprise resource planning (ERP) systems concepts
- Importance of integrated information systems in an organization.

COURSE OBJECTIVES: The objective of the course is to provide the student

- Understanding of the basic concepts of ERP systems for manufacturing or service companies, and the differences among MRP, MRP II, and ERP systems
- Thinking in ERP systems: the principles of ERP systems, their major components, and the relationships among these components
- Capability to adapt in-depth knowledge of major ERP components, including material requirements planning, master production scheduling, and capacity requirements planning
- Understanding knowledge of typical ERP systems, and the advantages and limitations of implementing such systems
- Understanding the business process of an enterprise
- Grasp the activities of ERP project management cycle
- Understanding the emerging trends in ERP developments

COURSE OUTCOMES: At the end of the course the student will be able to

- Examine systematically the planning mechanisms in an enterprise, and identify all components in an ERP system and the relationships among the components
- Understand production planning in an ERP system, and systematicallydevelop plans for an enterprise
- Use methods to determine the correct purchasing quantity and right time to buy an item, and apply these methods to material management
- Understand the difficulties of a manufacturing execution system, select a suitable performance measure for different objectives, and apply priority rules to shop floor control
- Knowledge of ERP implementation cycle
- Awareness of core and extended modules of ERP
- Apply emerging trends in ERP

UNIT-I

Introduction: Overview – Benefits of ERP – ERP and Related Technologies – Business Process Reengineering – Data Warehousing – Data Mining – On–line Analytical Processing – Supply Chain Management.

UNIT-II

IMPLEMENTATION: Implementation Life Cycle – Implementation Methodology – Hidden Costs – Organizing Implementation – Vendors, Consultants and Users – Contracts – Project Management and Monitoring.

UNIT- III

BUSINESS MODULES: Business Modules in an ERP Package – Finance – Manufacturing – Human Resource –Plant Maintenance – Materials Management – Quality Management – Sales and Distribution.

UNIT- IV

ERP MARKET: ERP Market Place – SAP AG – PeopleSoft – Baan Company – JD Edwards World Solutions Company – Oracle Corporation – QAD – System Software Associates.

UNIT- V

ERP-Present and future : Turbo Charge the ERP System – EIA – ERP and E–Commerce – ERP and Internet – Future Directions in ERP.

TEXT BOOKS

1. Alexis Leon, “ERP Demystified”, Tata McGraw Hill, 1999.
2. Joseph A. Brady, Ellen F. Monk, Bret J. Wangner, “Concepts in Enterprise Resource Planning” , Thomson Learning, 2001.
3. Vinod Kumar Garg and N.K .Venkata Krishnan, “Enterprise Resource Planning – concepts and Planning”, Prentice Hall, 1998.
4. Jose Antonio Fernandz, “ The SAP R /3 Hand book”, Tata McGraw Hill

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

MODERN CONTROL THEORY
(Open Elective-I)

M.Tech (EEE) I Year - I Semester

Course Code: GR17D5180 L/T/P/C : 3/1/0/4

PREREQUISITE: Control Systems, Mathematics.

COURSE OBJECTIVES

- To familiarize students with the modelling of systems
- To familiarize the students with the state space analysis of dynamic systems and observe their controllability and Observability.
- To make students understand the concepts of describing function analysis of nonlinear systems and analyze the stability of the systems.
- To analyze the stability of the nonlinear systems.

COURSE OUTCOMES

- Ability to obtain the mathematical model of any system.
- Ability to obtain the state model for dynamic systems.
- Ability to analyze the controllability and Observability for various types of control systems.
- Ability to understand the various types of nonlinearity.
- Ability to analyze the stability of the nonlinear systems.
- Ability to synthesize the nonlinear systems.

UNIT-I

MATHEMATICAL PRELIMINARIES: Fields, Vectors, Vector Spaces — Linear combinations and Bases — Linear Transformations and Matrices — Scalar Product and Norms ,Eigenvalues, Eigen Vectors and a Canonical form representation of linear operators, The concept of state — State Equations for Dynamic systems, Time invariance and Linearity Non uniqueness of state model — State diagrams for Continuous-Time State models.

UNIT-II

STATE VARIABLE ANALYSIS: linear Continuous time models for Physical systems-- Existence and Uniqueness of Solutions to Continuous- time State Equations — Solutions of Linear Time Invariant Continuous-Time State Equations—State transition matrix and it's properties.

CONTROLLABILITY AND OBSERVABILITY-General concept of controllability— General concept of Observability—Controllability tests for Continuous-Time Invariant Systems ---
Observability tests for Continuous-Time Invariant Systems— Controllability and Observability of State Model in Jordan Canonical form— Controllability and Observability Canonical forms of State model.

UNIT- III

NON LINEAR SYSTEMS -I

Introduction to Non Linear Systems - Types of Non-Linearities-Saturation-Dead-Zone - Backlash Jump Phenomenon etc;— Singular Points-Introduction to Linearization of nonlinear systems, Properties of Non Linear systems-Describing function-describing function analysis of nonlinear systems-Stability analysis of Non-Linear systems through describing functions.

UNIT-IV

NON LINEAR SYSTEMS-II

Introduction to phase-plane analysis, Method of Isoclines for Constructing Trajectories, singular points, phase- plane analysis of nonlinear control systems.

UNIT-V

STABILITY ANALYSIS

Stability in the sense of Lyapunov, Lyapunovs stability and Lyapunov's instability theorems - StabilityAnalysis of the Linear continuous time invariant systems by Lyapunov second method — Generation of Lyapunov functions Variable gradient method — Krasooviski's method.

TEACHING METHODOLOGIES

1. White board
2. PPTs
3. Seminars

EXT BOOKS

1. Modern Control System Theory by M.Gopal — New Age International -1999
2. Modern Control Fngineering by Ogata:K — Prentice Hall – 1997

REFERENCE BOOK

1. Control Systems Engineering, N. S. Nise: 4th Ed., Wiley, 2004.Engineering, 4th Ed., Wiley, 2004.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

COMPUTER–ORIENTED NUMERICAL METHODS IN ENGINEERING
(Open Elective-I)

M.Tech (Civil) I Year - I Semester

Course Code: GR17D5181 L/T/P/C : 3/1/0/4

COURSE OBJECTIVES

- To develop the skill of solving linear algebraic systems by direct and iteration methods.
- To illustrate advanced matrix techniques in the determination of Eigen values and Eigen vectors of square matrix.
- To analyze the performance of various interpolation technique and perform error analysis.
- To compare various numerical differentiation and integration techniques. •
- To explain the various techniques to study Initial and Boundary value problems in ODE.
- To solve a range of problems on applicable software.

COURSE OUT COMES: At the end of the course the student will be able to

- Solve linear algebraic system by direct and iteration methods.
- Apply the knowledge of Eigen values and Eigen vectors to some contents in engineering.
- Develop the skill of working with symmetric matrices in the study of Engineering problems.
- Apply the knowledge of interpolation and extrapolation of uniform and non uniform data to certain contents of Civil Engineering.
- Apply the knowledge of numerical differentiation and integration to some contents of Civil Engineering
- Learn grid based methods to solve Initial and Boundary value problems that arise in engineering problems.
- Develop the skill of solving computational problems using software.

UNIT-I

Solutions of linear equations: Direct method – Cramer's rule, Guass – Elimination method-Gauss Jordan elimination – Triangulation (LU Decomposition) method – Iterative methods Jacobi – Iteration method – Gauss – Siedel iteration, Successive over –relaxation method.

Eigen values and eigen vectors: Jacobi method for symmetric matrices- Given's method for symmetric matrices-Householder's method for symmetric matrices-Rutishauser method of arbitrary matrices –Power method.*Demonstration of solutions using open source software in Numerical Methods.

UNIT-II

Interpolation: Linear Interpolation - Higher order Interpolation - Lagrange Interpolation – Interpolating polynomials using finites differences- Hermite Interpolation -piece-wise and spline Interpolation.*Demonstration of solutions using open source software in Numerical methods.

UNIT - III

Finite Difference and their Applications: Introduction- Differentiation formulas by Interpolating parabolas – Backward and forward and central differences- Derivation of Differentiation formulae using Taylor series- Boundary conditions- Beam deflection – Solution of characteristic value problems- Richardson's extrapolation- Use of unevenly spaced pivotal points- Integration formulae by interpolating parabolas- Numerical solution to spatial differential equations. *Demonstration of solutions using open source software in Numerical Methods.

UNIT-IV

Numerical Differentiation: Difference methods based on undetermined coefficients- optimum choice of step length– Partial differentiation. Numerical Integration: Method based on interpolation-method based on undetermined coefficient – Gauss – Lagrange interpolation method- Radaua integration method- composite integration method – Double integration using Trapezoidal and Simpson's method.*Demonstration of solutions using open source software in Numerical Methods.

UNIT-V

Ordinary Differential Equation: Euler's method – Backward Euler method – Mid point method – single step method, Taylor's series method- Boundary value problems-case studies. *Demonstration of solutions using open source software in Numerical Methods.

***NOTE:** Demonstration of solutions using open source software in Numerical Methods only for the knowledge of students to apply in their Project Works. Not for examination.

TEXT BOOKS

1. M.K.Jain-S.R.K.Iyengar, R.K.Jain Numerical methods for scientific and engineering computations, Willey Eastern Limited, 1987
2. S.S.Shastry, Numerical methods.
3. Curtis I.Gerala, Applied numerical analysis, Addisson Wasley published campus.

REFERENCES BOOKS

1. C.Chopra, Raymond P.Canal, Numerical methods for Engineers Stevan, Mc. Graw Hill book Company, 4th edition, 2002.
2. C.Xavier, C Language and Numerical methods, New age international publisher, 2003.
3. Dr. M.Shanta Kumar, Computer based numerical analysis, Khanna Book publishers, New Delhi.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

ADVANCED COMPUTER ARCHITECTURE
(Open Elective-I)

M.Tech (ECE) I Year - I Semester

Course Code: GR17D5182 L/T/P/C : 3/1/0/4

COURSE OBJECTIVES

- To learn how to build the best processor/computing system understanding the underlying tradeoffs and ramifications.
- To identify and analyze the attributes of computer architecture design with recent trend technology.
- To identify the techniques to improve the speed and performance of computers – Parallelism in Instruction level – Hardware approaches - pipelining,dynamic scheduling, superscalar processors, and multiple issue of instructions.
- To implement the design aspects and categorize various issues , causes and hazards due to parallelisms.
- To examine and compare the performance with benchmark standards.
- To understand the framework for evaluating design decisions in terms of application requirements and performance measurements.
- To learn the design and analysis of complex and high performance multiprocessors and supporting subsystems from the quantitative aspect.

COURSE OUTCOMES: After going through this course the student will be able to

- An ability to discuss the organisation of computer-based systems and how a range of design choices are influenced by applications.
- An ability to understand the components and operation of a memory hierarchy and the range of performance issues influencing its design.
- An ability to interpret the organisation and operation of current generation parallel computer systems, including multiprocessor and multicore systems.
- An ability to understand the various techniques to enhance a processors ability to exploit instruction-level parallelism (ILP), and its challenges.
- An ability to know the classes of computers, and new trends and developments in computer architecture.
- An ability to develop the applications for high performance computing systems.
- An ability to undertake performance comparisions of modern and high performance computers.

UNIT -I

Fundamentals of Computer Design: Fundamentals of Computer design, Changing faces of computing and task of computer designer, Technology trends, Cost price and their trends, measuring and reporting performance, Quantitative principles of computer design, Amdahl's law.

Instruction set principles and examples- Introduction, classifying instruction set- memory addressing type and size of operands, Operations in the instruction set.

UNIT-II

Pipelines: Introduction, basic RISC instruction set, Simple implementation of RISC instruction set, Classic five stage pipe lined RISC processor, Basic performance issues in pipelining, Pipeline hazards, Reducing pipeline branch penalties.

Memory Hierarchy Design: Introduction, review of ABC of cache, Cache performance, Reducing cache miss penalty, Virtual memory.

UNIT-III

Instruction Level Parallelism (ILP) - The Hardware Approach: Instruction-Level parallelism, Dynamic scheduling, Dynamic scheduling using Tomasulo's approach, Branch prediction, High performance instruction delivery- Hardware based speculation.

ILP Software Approach:

Basic compiler level techniques, Static branch prediction, VLIW approach, Exploiting ILP, Parallelism at compile time, Cross cutting issues - Hardware verses Software.

UNIT-IV

Multi Processors and Thread Level Parallelism: Multi Processors and Thread level Parallelism-Introduction, Characteristics of application domain, Systematic shared memory architecture, Distributed shared – Memory architecture, Synchronization.

UNIT-V

Inter Connection and Networks: Introduction, Interconnection network media, Practical issues in interconnecting networks, Examples of inter connection, Cluster, Designing of clusters.
Intel Architecture: Intel IA-64 ILP in embedded and mobile markets Fallacies and pit falls.

TEXT BOOKS

1. John L. Hennessy, David A. Patterson - Computer Architecture: A Quantitative Approach, 3rd Edition, an Imprint of Elsevier.

REFERENCE BOOKS

1. John P. Shen and Miikko H. Lipasti -, Modern Processor Design : Fundamentals of Super Scalar Processors
2. Computer Architecture and Parallel Processing - Kai Hwang, Faye A.Brigs., MC Graw Hill.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

OPERATIONS RESEARCH
(Open Elective-I)

Mtech(ME) I Year - I Semester

Course Code: GR17D5183 L/T/P/C : 3/1/0/4

COURSE OBJECTIVES: The Objective of this course is to provide

- Analysis of quantitative methods and techniques for effective Decision–making.
- Constructing models that are used in solving business decision problems.
- Introduce the students to the use of basic methodology for the solution of linear programs and integer programs.
- Introduce the students to methods for solving large-scale transportation and assignment problems.
- Illustrate how sequencing is carried out in assigning jobs to machines
- Understand the concept of Inventory and apply different models in optimizing the same.
- Apply PERT/CPM: [Project scheduling and allocation of resources] to schedule and control construction of dams, bridges, roads etc. in an optimal way.

COURSE OUTCOMES: At the end of the course, the student will be able to:

- Apply various linear programming techniques for optimal allocation of limited resources such as machine, materials and money
- Solve transportation problems to minimize cost and understand the principles of assignment of jobs and recruitment polices.
- Solve game theory problems.
- Solve problems of inventory and develop proper inventory policies.
- Apply PERT/CPM: [Project scheduling and allocation of resources] to schedule and control construction of dams, bridges, roads etc in a optimal way.
- Solve sequencing problems.
- Develop optimum replacement policy

UNIT-I

Introduction: Definition and scope of operations research(OR),ORmodel, solving the O**R** model, art of modeling, phases of OR study.

Linear Programming:

Two variable Linear Programming model and Graphical method of solution, Simplex method, Dual Simplex method, special cases of Linear Programming, duality, sensitivity analysis.

UNIT-II

Transportation Problems: Types of transportation problems, mathematical models, transportation algorithms

Assignment: Allocation and assignment problems and models, processing of job through machines.

UNIT-III

Network Techniques: Shortest path model, minimum spanning Tree Problem, Max-Flow problem and Min-cost problem.
Project Management: Phases of project management, guidelines for network construction, CPM and PERT.

UNIT-IV

Theory of Games: Rectangular games, Min-max theorem, graphical solution of 2xnormx2 games, game with mixed strategies, reduction to linear programming model.
Quality Systems: Elements of Queuing model, generalized Poisson queuing model.

UNIT-V

Inventory Control: Models of inventory, operation of inventory system, quantity discount.
Replacement models: Equipments that deteriorate with time, equipments that fail with time.

TEXT/ REFERENCE BOOKS:

1. Wayne L. Winston,"OperationsResearch", Thomson Learning, 2003.
2. Hamdy H. Taha, "Operations Research - An Introduction", Pearson Education, 2003.
3. R. Panneer Seevam, "Operations Research", PHI Learning, 2008.
4. V. K. Khanna, "Total Quality Management", New Age International, 2008.

TEACHING METHODOLOGY

1. Lecture is delivered on blackboard, preparing OHP sheets and by preparing Power point presentations.
2. Seminars are conducted on new technologies related to subject.
3. Assignments are given.
4. Group discussions are conducted on familiar topics related to subject.
5. Industrial visits for practical exposure to understand and explore things.

II- SEMESTER

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

DISTRIBUTED COMPUTING

M.Tech (Software Engineering) I Year - II Semester
Course Code: GR17D5012 L/T/P/C : 3/1/0/4

PREREQUISITES

- Basic understanding of Computer Networks
- Basic Understanding of Object Oriented concepts

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Ability to understand the distributed computing environment.
- Ability to different distributed computing paradigms.
- Understanding the remote computing concept.
- Understanding of the distributed multimedia systems.
- Understanding of distributed document based systems.
- Ability to understand basic concept of Grid Computing
- Ability to understand basic concept of Cluster Computing

COURSE OUTCOMES: At the end of the course the student will be able to:

- Compare and differentiate between different computing techniques
- Understand the different computing paradigms
- Demonstrate of the remote method invocation and its comparison with CORBA
- Define and study the Distributed Document Based systems.
- Capable to understand the characteristics of distributed multimedia systems.
- Understand the outline of the Grid computing concept.
- Introduction to cluster computing concept.

UNIT-I

Introduction: The different forms of computing, monolithical, distributed, parallel and cooperative computing, meaning of distributed computing, operating system concepts relevant to distributed computing, the architecture of distributed applications.

UNIT-II

Distributed Computing Paradigms: 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- RMI, ORB, the object space paradigm, the mobile agent paradigm, the network service paradigm, the collaborative application, choosing a paradigm for an application.

UNIT-III

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, The CORBA object interface, Inter-ORB protocols, object servers and object clients, CORBA object references, CORBA Naming Service, CORBA object services, object Adapters, Java IDL, An example CORBA application. Steps and methods used in implementing a CORBA object-based application.

UNIT-IV

Distributed Document-based System: WWW and Lotus Notes, Distributed Coordination based System- Introduction to coordination system models, TIB, JINI, comparison of TIB and JINI, Software agents, agents technology, mobile agents. Distributed Multimedia Systems: Characteristics of Multimedia data, QOS of services management, Resource management, stream adaptation.

UNIT-V

Grid Computing: Definition of Grid, grid types – computational grid, data grid, grid benefits and applications drawbacks of grid computing, grid components, grid architecture and its relation with various distributed technologies.

Cluster Computing: Parallel computing overview, cluster computing – Introduction, Cluster architecture, parallel programming models and paradigms, applications of clusters.

TEXT BOOKS

1. Distributed computing principles and applications, M.L.Liu, Pearson Edition.
2. Distributed computing principles and applications A.S Tanenbaum.
3. Client/ Server programming with java and CORBA, second edition, R.Orfali and Dan Harkey, john white and sons.
4. Grid Computing, J.Joseph & C.Fellenstein, Pearson education.
5. High Performance Cluster Computing, Rajkumar Buyya, Pearson education.

REFERENCE BOOKS

1. A networking approach to grid computing, D.Minoli, wiley.
2. Java programming with CORBA 3 rd edition.
3. Java Network Programming:E.R.Harold,2nd edition, O'Reilly,SPD
4. Distributed Systems, Concepts and Design, 3rd Edition G.Colouris, J.Dollimore, Pearson Education
5. Java Programming with CORBA,3rd edition , Brose, Vogel,Duddy, Wiley DreamTech

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

SOFTWARE QUALITY ASSURANCE AND TESTING

M.Tech (Software Engineering) I Year - II Semester
Course Code: GR17D5029 L/T/P/C : 3/1/0/4

PREREQUISITES

- A Fundamental Software Engineering course.

COURSE OBJECTIVES: The objective of the course is to provide the student

- Capability to develop and implement a Software Quality Assurance Plan and understand various standards of Software Quality.
- Capability to understand fundamentals of measurement and Software Quality Metrics.
- Skill of establishing a test strategy and devise a software testing methodology.
- Appraise about various testing techniques for their effectiveness.
- Illustration on various software testing tools like Load Runner and Win Runnerand their performance
- Development of a test plan and multi-step testing process for a given a project
- Development of strategies for testing specialized applications.

COURSE OUTCOMES: At the end of the course the student will be able to:

- Realize the importance of Software Quality and its Framework
- Evaluate various quality metrics.
- Apply a testing strategy for a given test environment
- Apply various testing techniques
- Appraise various software testing tools for software testing.
- Appraise a eleven step testing process of software systems.
- Develop strategies for testing specialized systems.

UNIT-I

Software Quality Assurance Framework and Standards SQA Framework: What is quality? Software Quality Assurance, Components of software quality Assurance- software quality Assurance Plan: steps to develop and Implement a software assurance Plan- Quality standards: ISO 9000 and companion ISO standards, CMM, CMMI, PCMM, Malcolm Balridge, 3 sigma, 6 sigma.

UNIT-II

Software Quality Assurance Metrics and Measurement Software Quality Metrics: Product quality metrics, In-process quality metrics, Metrics for software maintenance, example of metric programs

Software Quality Metrics Methodology: Establish quality requirement, identify software quality metrics, implement the software quality metrics , analyze software metric results, validate the software quality metrics- software quality indicators- Fundamentals in Measurement theory.

UNIT-III

Software Testing Strategy and Environment: Establishing testing policy, structured approach to testing, test factors, economics of system development life cycle(SDLC) Testing.
Software Testing Methodology: Defects hard to find, verification and validation, functional and structural testing, work bench concept, eight considerations in developing testing methodologies, testing tactics checklist.

UNIT-IV

Software Testing Techniques: Black box, Boundary value, bottom-up, Branch coverage, cause-effect graphing, CRUD, Database, Exception, Gray-Box, Histograms, Inspections, JAD's, Pareto analysis, prototyping, Random Testing, Risk-based Testing, Regression testing, structured walkthroughs, Thread testing, Performance testing, White-box testing Software testing tools: Taxonomy of testing tools, Methodology to evaluate automated testing tools, Load Runner, win Runner and Rational Testing tools, Silk test, Java testing tools, JMetra, JUnit and Cactus.

UNIT-IV

Testing Process & Eleven Step Testing Process: Asses project management development estimate and status, Develop test plan, Requirements phase testing, design phase testing, program phase testing, Execute test and Record results, acceptance test, Report test results, testing software installation, Test software changes, evaluate test effectiveness.
Testing Specialized Systems and Applications: Testing client/server – web applications, testing off the shelf components, testing security, Testing a Data warehouse.

TEXT BOOKS

1. Effective Methods for Software testing, 2nd Edition, William E.Perry, Second Edition, Wiley India, 2006.
2. Software Quality by Mordechai Ben-Menachem/Garry S. Marliss, by Thomson Learning publication,1997

REFERENCE BOOKS

1. Testing and Quality Assurance for Component-based Software, by Gao, Tsao and Wu, Artech House Publisher
2. Software Testing Techniques, by Bories Beizer, Second Edition, DreamTech Press
3. Managing the Testing Process, by Rex Black, Wiley
4. Handbook of Software Quality Assurance, by G. Gordon Schulmeyer, James I.McManus, Second Edition, International Thomson Computer Press
5. Software Testing and continuous Quality Improvement, by William E.Lewis, Gunasekaran Veerapillai, Second Edition, Auerbach Publications
6. Metrics and Models for Software Quality Engineering, by Stephen H. Kan, by Pearson Education Publication

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

SERVER SIDE SCRIPTING LANGUAGES

M.Tech (Software Engineering) I Year - II Semester
Course Code: GR17D5030 L/T/P/C : 3/1/0/4

PREREQUISITES

- Knowledge on client side scripting languages
- Knowledge on DBMS & SQL
- Knowledge of HTML and Web Applications

COURSE OBJECTIVES: The objective of the course is to provide the student

- Knowledge of designing, planning, implementation of software using scripting languages.
- Importance of the software development process.
- Capability to programming skills in constructing a complete end to-end information system solution.
- Insight into Developing Web sites using php & mysql.
- Analyze Data Base design methodology, OLTP, OLAP and DB connectivity.
- Capability to Design and implement Python software solutions that accommodate specified requirements and constraints, based on analysis or modeling or requirements specification.
- To understand effectively, use, and develop modern data storage, interpretation, analytical and simulation technologies

COURSE OUTCOMES: At the end of the course the student will be able to

- Analyze a problem, identify and define the computing requirements appropriate to its solution.
- Develop applications using PERL, PHP, TCL, Tk, Python
- Understand connecting Web pages with DB
- Develop a form containing several fields and be able to process the data provided on the form by a user in a PHP-based script.
- Understand basic PHP syntax for variable use, and standard language constructs, such as conditionals and loops.
- Understand the syntax and use of PHP object-oriented classes.
- Understand the syntax and functions available to deal with file processing for files on the server as well as processing web URLs.

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, Datatypes, 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, Installing and Configuring MySQL, Working with Data bases and Tables- Working with databases, tables, Database Queries, Stored Routines, Securing MySQL, SQL Injection.

UNIT-III

Advanced PHP Programming PHP and Web Forms, Files, PHP Authentication and Methodolgies - Hard Coded, File Based, Database Based, IP Based, Login Administration,Uploading Files with PHP.

UNIT-IV

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. Beginning PHP and MySQL, 3rd Edition , Jason Gilmore,Apress Publications (Dreamtech.).
2. The World of Scripting Languages, David Barron,Wiley India.
3. Python Web Programming, Steve Holden and David Beazley,New Riders Publications.

REFERENCE BOOKS

1. Open Source Web Development with LAMP using Linux ,Apache,MySQL,Perl and PHP,Lee and B.Ware(Addison Wesley) Pearson Education.
2. Programming Python,M.Lutz,SPD.
3. PHP 6 Fast and Easy Web Development ,Julie Meloni and Matt Telles, Cengage Learning Publications.
4. PHP 5.1,I.Bayross and S.Shah,The X Team,SPD.
5. Core Python Programming,Chun,Pearson Education.
6. Guide to Programming with Python,M.Dawson,Cengage Learning.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

SERVICE ORIENTED ARCHITECTURE

(Elective -III)

M.Tech (Software Engineering) | I Year - II Semester
Course Code: GR17D5021 | L/T/P/C : 3/1/0/4

PREREQUISITES

- Fundamentals of J2EE
- Fundamentals of Web Services

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Design models for SOA.
- Understanding about the model and gain the Knowledge.
- Capability to Design SOA models.
- Capability to build the Web Service Extensions.
- Understanding about the SOA integration and performance.
- Introduction to Build the business models.
- Design the business planning of SOA.

COURSE OUTCOMES: At the end of the course the student will be able to:

- Develop a logical model for SOA.
- Ability to gain a knowledge for a organization to set services.
- Develop a SOA modelling use cases.
- Develop the web services Extensions.
- Design the service message to facilitate integration and performance.
- Develop a model for SOA for business analysis.
- Build the Business planning of a SOA.

UNIT-I

SOA and Web Services Fundamentals: Introducing SOA-Fundamental SOA, Common characteristics of Contemporary SOA, Common tangible benefits of SOA, Common pitfalls of adopting SOA. Evolution of SOA- an SOA timeline, the continuing evolution of SOA, The roots of SOA. Web Services and primitive SOA- the Web Services frame work, Services, Service descriptions, messaging.

UNIT-II

Web Services Extensions: Web Services and Contemporary SOA-- Message exchange patterns, Service Activity, Coordination, Atomic transactions, Business Activities, Orchestration, Choreography, Addressing, Reliable messaging, Correlation, Policies, Metadata exchange and Security.

UNIT-III

SOA and Services – Orientation: Principles of Service Orientation -- Anatomy of SOA, Common Principles of Service-Orientation, interrelation between Principles of Service-Orientation, Service-Orientation and Object Orientation, Native Web Services support for Principles of Service-Orientation.

Service Layers - Service-Orientation and Contemporary SOA, Service Layer abstraction, Application Service Layer, Business Service Layer, Orchestration Service Layer, Agnostic Services, Service Layer Configuration Scenarios.

UNIT-IV

Building SOA (Planning and Analysis): SOA Delivery Strategies-- SOA delivery lifecycle phases, the top-down strategy, The bottom-up strategy, The agile strategy. Service Oriented Analysis-- Introduction to Service Oriented Analysis, Benefits of a Business Centric SOA, Deriving Business Service, Service Modeling, Service Modeling guidelines, Classifying Service model logic, Contrasting Service modeling approaches.

UNIT-V

Building SOA (Technology and Design): Service Oriented Design--Introduction to Service-Oriented design, WSDL related XML schema language basics, WSDL language basics, SOAP language basics, Service interface design tools.

Service Design--Service Design overview, Entity-centric business Service Design, Application Service Design, Task-centric business Service Design, Service Design guidelines. SOA Platforms--SOA Platform basics, SOA support in J2EE and .NET, Integration Considerations.

TEXT BOOKS

1. Service-Oriented Architecture-Concepts, Technology, and Design, Thomas Erl, Pearson Education.
2. Understanding SOA with Web Services, Eric Newcomer, Greg Lomow, Pearson Education.

REFERENCES

1. The Definitive guide to SOA, Jeff Devies& others, Apress, Dreamtech.
2. Java SOA Cook book, E.H Hewitt,SPD.
3. SOA in practice, N.M.Josuttis,SPD.
4. SOA for Enterprise Applications, Shankar.K, Wiley India Edition.
5. SOA-Based Enterprise Integration, W.Roshen, TMH.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

SOFTWARE ARCHITECTURE AND DESIGN PATTERNS (Elective-III)

M.Tech (Software Engineering) I Year - II Semester
Course Code: GR17D5007 L/T/P/C : 3/1/0/4

PREREQUISITES

- Fundamentals of Quality Attributes.
- Fundamentals of pattern Structure.

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Capability to Analyze a software development problem and express its essence succinctly and precisely;
- Design of module structure to solve a problem, and evaluate alternatives
- Implementing a module so that it executes efficiently and correctly
- Understanding the design patterns that are common in software applications
- Understanding the design patterns are standard solutions to common software design problems.
- Ability to use systematic approach that focus and describe abstract systems of interaction between classes, objects, and communication flows.
- Introduction to the concepts of software products and software processes

COURSE OUTCOMES: At the end of the course the student will be able to

- Select appropriate patterns in solving software related issues.
- Design and implement a software product based on reusability
- Design the architecture of modern systems for solving real world problems.
- Ability to analyze and model requirements and constraints for the purpose of designing and implementing software systems.
- Evaluate the correctness of a module by careful manual review using the specification, and abstraction function
- Identify key entities and relationships in the problem domain
- Understand the appropriate roles of sub typing and inheritance, and use them effectively

UNIT-I

Envisioning Architecture: The Architecture Business Cycle, What is Software Architecture, Architectural patterns, reference models, reference architectures, architectures, architectural structures and views.

UNIT-II

Creating an Architecture: Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.

UNIT-III

Analyzing Architectures: Architecture Evaluation, Architecture design decision making, ATAM, CBAM.

UNIT-IV

Moving from One System to Many: Software Product Lines, Building systems from off the shelf components, Software architecture in future.

UNIT-V

Patterns: Pattern Description, Organizing catalogs, role in solving design problems, Selection and usage.Creational and Structural patterns: Abstract factory, builder, factory method, prototype, singleton, adaptor, bridge, composite, façade, flyweight, proxy.Behavioral Patterns: Chain of responsibility, command, interpreter, iterator, mediator, memento, observer, state, strategy, template, method, visitor.

TEXT BOOKS

1. Software Architecture in Practice, second edition, Len Bass Paul Clements & Rick Kazman, Pearson Education, 2003.
2. Design Patterns, Erich Gamma, Pearson Education, 1995.

REFERENCE BOOKS

1. Beyond Software architecture, Luke Hohmann, Addison wesley, 2003.
2. Software architecture, David M.Dikel, David Kane and James R. Wilson, Prentice Hall PTR, 2001.
3. Pattern Oriented Software Architecture, F. Buschmann & others, John Wiley & Sons.
4. Head First Design Patterns, Eric Freeman & Elisabeth Freeman, O'REILLY, 2007.
5. Design Patterns in java, Steven John Metsker & William C. Wake, Pearson Education.
6. J2EE Patterns, Deepak Alur, John Crupi & Dan Malks, Pearson Education, 2004.
7. Design Patterns in C#, Steven John Metsker, Pearson Education, 2003.
8. Software Design, David Budgen, second edition, Pearson Education, 2003.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

FORMAL METHODS IN SOFTWARE ENGINEERING (Elective-III)

M.Tech (Software Engineering) I Year - II Semester
Course Code: GR17D5033 L/T/P/C : 3/1/0/4

PREREQUISITES

- Concepts of Formal languages
- Concepts of Compiler Design

COURSE OBJECTIVES: The objective of the course is to provide the student

- Designing of the Formal Languages.
- Design of the Compiler Design concepts.
- Building mechanism of the Structure of formal Methods.
- Building the models for Formal Specification Style.
- Introduction to the Concept of VDM.
- Designing the Z Notation and its Modules.
- Building the Formal Semantics And Tools.

COURSE OUTCOMES: At the end of the course the student will be able to

- Apply the knowledge and implement the Formal Languages.
- Develop the Compiler Design Concepts.
- Develop the structure of Formal Methods.
- Design the Different Formal Specification methods.
- Design the Concepts for VDM.
- Develop the Z Notation and its Modules.
- Develop the Formal Semantics And Tools.

UNIT-I

Introduction: Need for Formal methods, Problems in Natural Language Specifications, Formal Versus Informal Programming, Advantages of Formal Methods, Requirements of Formal System, Types, Prepositional Logic, Predicate Logic, Relationships and Functions.

UNIT-II

Formal Specification Style: Model-Oriented, Specifications, Concurrency-Based Specifications, Example Specification Languages.

UNIT-III

VDM: Introduction to VDM, Basic Types, Quote Types, Compound Types, Optional Types, Functions, and Operations, Additional Constructs, Modules.

UNIT-IV

The Z Notation: The Interchange Language, User-Defined Identifiers, Data Types, Basic Types, Compound Types, Schemas, Additional Constructs.

UNIT-V

Formal Semantics And Tools: Operational Semantics, Denotational Semantics, Axiomatic Semantics Proof Editors. Proof Analysers, Symbolic Simulators, Translators. Test Generation Tools.

TEXT BOOKS

1. Andrew Harry, " Formal Methods: Fact File VDM and Z", John Wiley and Sons, 1996.
2. Jim Woodcock, Jim Davies, "Using Z Specification, Refinement and Proof", Prentice Hall International, 1996.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

MULTIMEDIA AND RICH INTERNET DEVELOPMENT (Elective-IV)

M.Tech (Software Engineering) | I Year - II Semester
Course Code: GR17D5031 | L/T/P/C : 3/1/0/4

PREREQUISITES

- Fundamentals of Data Communication Concepts
- Fundamentals of Multimedia concepts

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Understanding the difference between Multimedia Communication and Multimedia Networks
- Analysis of different compression and decompression techniques for Multimedia communication such as Text, Image, Audio and Video.
- Knowledge about the different applications of Multimedia Networks
- Differentiate between Web 1.0, Web 2.0, Web 3.0 and Web 4.0.
- Visualization the Rich Internet Application through Adobe Flash and Flex
- Distinction between Traditional Web based Applications and Ajax based web applications
- Knowledge about how to develop Web 2.0 by using DOJO tool kit

COURSE OUTCOMES: At the end of the course the student will be able to

- Find the difference between Multimedia Communication and Multimedia Networks
- Implement some of the compression and decompression algorithms by using different media such as Text, Image, Audio and Video
- Demonstrate some multimedia applications by using Java language
- Develop Web 2.0 with rich Internet features
- Implement multimedia animation movie through Adobe Flash and Flex
- Develop a Ajax based web application
- Design a Ajax based web application by using DOJO Tool kit

UNIT-I

Introduction to Multimedia: Internet and Multimedia communications, Multimedia Networks, Multimedia Applications, Multimedia Information representation-Digitization Principles, Text, Images, Audio and Video, Compression Methods-Basic Coding Methods-Run Length coding, Huffman coding, Arithmetic coding, Discrete Cosine Transform, Differential PCM, Motion Compensated Prediction, Video Compression- JPEG, H.261, MPEG-1 Video, MPEG 2 and 3 Video, H.263, Wavelet and Fractal Image Compression, Audio Compression.

UNIT-II

Multimedia Applications in Networks: Introduction, Application Level Framing, Audio/Video Conferencing-Session Directories, Audio/Video Conferencing, Adaptive Applications, Receiver Heterogeneities, Real Time Application with Resource Reservation, Video Server, Applications requiring reliable multicast-White Board, Network Text Editor for Shared Text Editing, Multi Talk, Multicast file transfer, Multimedia Applications on the World Wide Web-Multicast web Page sharing, Audio/Video Streams in the www, Interactive Multiplayer Games.

UNIT-III

Web 2.0: What is Web 2.0, Search , Content Networks, User Generated Content, Blogging, Social Networking, Social Media, Tagging, Social Marking, Rich Internet Applications, Web Services, Mashups, Location Based Services, XML, RSS, ATOM , JSON, and VoIP, Web 2.0 Monetization and Business Models, Future of the Web.

UNIT-IV

Rich Internet Applications (RIAs) with Adobe Flash and Flex: Adobe Flash-Introduction, Flash Movie Development, Learning Flash with Hands-on Examples, Publish your Flash Movie, Creating Special Effects with Flash, Creating a website splash screen, action script, Web Sources. Adobe Flex 2-Introduction, Flex Platform Overview, Creating a Simple User Interface, Accessing XML data from your Application, Interacting with server side Applications, Customizing your User Interface, Creating Charts and Graphs, Connection Independent RIAs on the Desktop-Adobe Integrated Run Time(AIR), Flex 3 Beta.

UNIT-V

Ajax-enabled Rich Internet Application: Introduction, Traditional Web Applications vs Ajax Applications, Rich Internet Application with Ajax, History of Ajax, Raw Ajax example using xmlhttprequest object, Using XML, Creating a full scale Ajax Enabled application, Dojo Toolkit.

TEXT BOOKS

1. Multimedia Communications :Protocols and Applications, Franklin F Kuo, JJoaquin Garcia, Wolf gang Effelsberg, Prentice Hall Publications.
2. Multimedia Communications: Applications, Networks, Protocols and Standards, Fred Halsall, Addison Wesley Publications.
3. Ajax, Rich Internet Applications, and Web Development for Programmmers,Paul J Dietel and Harvey M Deitel, Deitel Developer Series, Pearson education.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

SOFTWARE AGENTS
(Elective-IV)

M.Tech (Software Engineering) I Year - II Semester

Course Code: GR17D5034 L/T/P/C : 3/1/0/4

PREREQUISITES

- Fundamentals of Data Communication
- Basic Knowledge about Java language

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Introduction about the concepts, techniques and applications of software agents.
- Understanding the nature, concepts and techniques of the agent technology and its standards and to evaluate current software agent systems.
- Characteristics of the agents, their design and implementation is described in the architecture level.
- Knowledge about the myths and realities of the agent-based systems
- Information about how to develop an agent-based system for a particular task
- Evolution from object-oriented development to agent-based systems
- Knowledge about how to incorporate and share knowledge among software agents

COURSE OUTCOMES: At the end of the course the student will be able to

- Understand the basic concepts techniques and applications of software agents.
- Learn how to do a research.
- Understand software agents design tools.
- Understand the agent system terminology and development process of agent-based systems.
- Learn learned techniques to design agent-based system.
- Knowledge about architecture of the current software systems and re-structure them to be agent-based.
- Design a moderately realistic software agent

UNIT-I

The agent landscape – The smart agent framework: Introduction – Initial concepts– Entities-Objects – Agents – Autonomy – Tropistic agent – Specificationstructure of SMART. – Agent relationships – An operational analysis of Agentrelationships.

UNIT-II

Sociological Agents - Autonomous Interaction - Contract Net as a global directedsystem – Computational Architecture for BDI agents – Evaluating socialdependence networks – Normative agents.

UNIT-III

Intelligent Agents –Deductive Reasoning Agents – Practical reasoning agents -Reactive agents – Hybrid Agents – Understanding Each other – Communicating –Methodologies

UNIT-IV

Modeling multi agent system with AML – JADE:Java Agent development framework –wireless sensor networks and software Agents – Multi agent PlanningSecurity and anonymity in agent systems.

UNIT-V

Multi Agent system: Theory approaches and NASA applications – Agent basedcontrol for multi-UAV information collection- Agent based decision supportsystem for Glider pilots – Multi agent system in E- Health Territorial Emergencies– Software Agents for computer network security-Multi-Agent Systems,Ontologies and Negotiation for Dynamic Service Composition in Multi-Organizational Environmental Management.

TEXT BOOKS

1. Mohammad Essaaidi, Maria Ganzha, and Marcin Paprzycki, “SoftwareAgents, Agent Systems and Their Applications”, IOS Press, 2012.
2. Mark d Inverno and Michael Luck, “Understanding Agent Systems”,Springer,2010.

REFERENCES BOOKS

1. Michael Wooldridge, “An Introduction to Multi Agent Systems”, John Wiley & Sons Ltd., 2009.
2. Lin Padgham, Michael Winikoff, “Developing Intelligent Agent Systems: A Practical Guide”, John Wiley & Sons Ltd., 2004.
3. Bradshaw , “Software Agents” , MIT Press, 1997.
4. Richard Murch, Tony Johnson, “Intelligent Software Agents”, Prentice Hall,2000

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

IMAGE PROCESSING AND PATTERN RECOGNITION (Elective-IV)

M.Tech (Software Engineering) | I Year - II Semester
Course Code: GR17D5008 | L/T/P/C : 3/1/0/4

PREREQUISITES

- Multimedia Concepts
- Basics of Differential Equations and Probability

COURSE OBJECTIVES: The objective of the course is to provide the student

- Introduction of the basic principles of digital images, image data structures , and image processing algorithms.
- Exposure to current technologies and issues that are specific to image processing systems
- Capability to various image enhancement techniques to improve the original image quality.
- Understanding basic difference between computer vision and image processing types.
- Understanding and implementation of digital and analog filter design.
- Learn about the various application of wavelet transform in the field of image processing.
- Introduction about fundamental concepts , theories and algorithms for pattern recognition and machine learning.

COURSE OUTCOMES: At the end of the course the student will be able to

- Acquire the fundamental concepts of a digital image processing system.
- Analyze the transformation domain representation of images.
- Identify and interpret the concepts of low and midlevel processing.
- Gain experience in applying image processing algorithms for histogram equalization, enhancement, restoration, filtering, image compression, image segmentation to real problems.
- Use decision-theoretic recognition which is based on representing patterns for image representation.
- Understand the fundamental pattern recognition and machine learning theories.
- Ability to design and implement certain important pattern recognition techniques.

UNIT-I

Fundamental steps of image processing, components of an image processing system. The image model and image Acquisition, sampling and quantization, relationship between pixels, distance functions, scanner.

UNIT-II

Statistical and spatial operations, Intensity functions Transformations, histogram processing, smoothing & sharpening-spatial filters, Frequency domain filters, homomorphic filtering, image filtering & restoration. Inverse and weiner filtering, FIR weiner filter, Filtering using image transforms, smoothing splines and interpolation. Morphological and other area operations, basic morphological operations, opening and closing operations, dilation erosion, Hit or Miss transform, morphological algorithms

UNIT-III

Segmentation and Edge detection region operations, basic edge detection, second order detection, crack edge detection, gradient operators, compass and laplace operators, edge linking and boundary detection, thresholding, region based segmentation, segmentation by morphological watersheds. Image Compression, Types and requirements, statistical compression, contour coding, quantizing compression, image data compression-predictive technique, pixel coding, transfer coding theory, lossy and lossless predictive type coding.

UNIT-IV

Representation and Description chain codes, polygonal approximation, Signature boundary systems, Skeletons, Boundary Descriptors, Relational Descriptors, Principal components for Description, Relational Description.

UNIT-V

Pattern Recognition Fundamentals, Basic concepts of Pattern Recognition, Fundamental problems in Pattern Recognition system, design concepts and methodologies, example of automatic Pattern Recognition systems, a simple automatic Pattern Recognition model.
Pattern classification by distance function, Measure of similarity, Clustering criteria, K-means algorithm, pattern classification by likelihood function: Pattern classification as a statistical decision problem, Bayes classifier for normal.

TEXT BOOKS

1. Digital Processing 3rd edition, pearson edition, Rafeal C.Gonzalez, Richard e. Wood.
2. Pattern recognition principles: Julus T.Tou and Rafel C.Gonzalez.

REFERENCE BOOKS

1. Image processing , analysis and machine vision, second edition.
2. Fundamentals of digital image processing- by A.K Jain.PH.
3. Pettern recognition, R.Shinghal, Oxford university press.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

SERVER SIDE SCRIPTING LANGUAGES LAB

M.Tech (Software Engineering) — I Year - II Semester
Course Code: GR17D5030 — L/T/P/C : 0/0/4/2

PREREQUISITES

- Knowledge on client side scripting languages
- Knowledge on DBMS & SQL
- Knowledge of HTML and Web Applications

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Ability to use scripting languages like PERL, PHP, Python to develop applications.
- Training in becoming proficient PHP/MySQL web developers.
- Ability to program Python programs using subset of data types and using assignment, method calls, while loops, for loops, and conditionals.
- Understand about process and skills necessary to effectively deal with problem solving in relation to writing programs.
- Ability to read data from text files, and write formatted text files.
- able to manipulate data from one format into another.
- Ablility to use the Python Regular Expression capabilities for data verification

COURSE OUTCOMES: At the end of the course the student will be able to

- Understand process of executing a PHP-based script on a webserver.
- Handle with different Data Base languages.
- Architect, write, debug, and run complete web applications using PHP and MySQL.
- Basic understanding of the web technology and be able to architect, write, debug, and run complete web applications using PHP and MySQL.
- Construct simple graphical user interfaces that drive their programs.
- Understand the paradigm for dealing with form-based data, both from the syntax of HTML forms, and how they are accessed inside a PHP-based script.
- Interact with websites and load data from them (web scraping).

PHP

Week 1

Write a PHP script for the following.

a. Find the biggest of 3 numbers.
b. Find the factorial of a number (while loop)
c. To reverse the digit (Use do while)
d. Find the sum of the digits (Use for loop)
e. Display the Fibonacci series for a particular limit.(Use for loop)

f. Check the given letter is vowel or not.
g. Check whether the given number is Prime or not.

Week 2

a. Write a PHP script to create an associative array with book details and display.
b. Write a PHP script to create an array and try with all array functions.

Week 3

a. Write a PHP script to create Cookie, store a value "Ganesh" in the cookie.
b. Write a PHP script to store, retrieve and delete data using session variables.
c. Write a program for Cinema Ticketing. All the age should be over 12 years, if less than, don't allow to get ticket. (apply the exception handling).

Week 4

a . Write a PHP program to display the contents of a file using fgets, fgetc, fread functions. b. Write a PHP program to upload a file and display the contents in server.

Week 5

Create a registration form which contains fields name, Roll No, Gender and a submit button. All the details should be displayed in the server page when the user clicks the submit button.

Week 6

a. Design a database in MYSQL using PHP. Create table in database. Store, Update, Delete and Retrieve data from the table. Display the data from the table.
b. Design a PHP application that will provide a form containing fields to fill book detail (Book title, Author, Publication, ISBN, Price and category). Display filled details to the user.

Week 7

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

Week 8

Using PHP and MySQL, develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.

Week 9

Write a PHP script using scalar variables.

i. Find the biggest of 3 numbers.
ii. To check whether a number is positive or negative.
iii. Find the factorial of a number (while loop)

iv. To reverse the digit (Use do while)
v. Find the sum of the digits (Use for loop)
vi. Fibonacci series for a particular limit.(Use for loop)

PYTHON

Week 10

Write a Python script using basic data types.

a. Find the biggest of 3 numbers.
b. To check whether a number is positive or negative.
c. Find the factorial of a number
d. To reverse the digit
e. Find the sum of the digits
f. Fibonacci series for a particular limit.

Week 11

a. Write a Python script to test built in methods of Strings.
b. Write a Python script to test various functions of List and Tuple.

Week 12

a. Write a Python script to test various functions of Dictionary.
b. Write a Python script to define a function and calling the function by passing arguments. (using pass by value & pass by reference).

TEXT BOOKS

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

OPEN ELECTIVE - II

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

HUMAN COMPUTER INTERACTION
(Open Elective-II)

M.Tech (CSE) I Year - II Semester

Course Code: GR17D5184 L/T/P/C : 3/1/0/4

COURSE OBJECTIVES: Students undergoing the course are expected to:

- Demonstrate an understanding of guidelines, principles, and theories influencing human computer interaction.
- Recognize how a computer system may be modified to include human diversity.
- Select an effective style for a specific application.
- Design mock ups and carry out user and expert evaluation of interfaces.
- Carry out the steps of experimental design, usability and experimental testing, and
- Evaluation of human computer interaction systems.
- Use the information sources available, and be aware of the methodologies and technologies supporting advances in HCI.

COURSE OUTCOMES: At the end of the course, the student will be able to:

- Describe what interaction design is and how it relates to human computer interaction and other fields.
- Describe the social mechanisms that are used by people to communicate and collaborate.
- Describe how technologies can be designed to change people's attitudes and behavior.
- Discuss how to plan and run a successful data gathering program.
- Discuss the difference between qualitative and quantitative data and analysis.
- Discuss the conceptual, practical, and ethical issues involved in evaluation.
- Describe how to perform two types of predictive techniques, GOMS and Fitts Law, and when to use them.

UNIT-I

Introduction: Importance of user Interface –definition, importance of good design. Benefits of good design. A brief history of Screen design. The graphical user interface –popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics-Principles of user interface.

UNIT-II

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

UNIT-III

Screen Designing: Design goals –Screen planning and purpose, organizing screen elements, ordering of screen data and content –screen navigation and flow –Visually pleasing composition

–amount of information –focus and emphasis –presentation information simply and meaningfully –information retrieval on web –statistical graphics –Technological consideration in interface design.

UNIT-IV

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

UNIT-V

Mobile Ecosystem: Platforms, Application frameworks- Types of Mobile Applications: Widgets, Applications, Games- Mobile Information Architecture, Mobile 2.0, Mobile Design: Elements of Mobile Design, Tools.

Interaction Devices – Keyboard and Function Keys – Pointing Devices – Speech Recognition Digitization and Generation – Image and Video Display – Drivers.

TEXT BOOKS

1. The essential guide to user interface design, Wilbert O Galitz, Wiley Dreamtech.
2. Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia
3. Brian Fling, “Mobile Design and Development”, First Edition, Reilly Media Inc., 2009

REFERENCE BOOKS

1. Human – Computer Interaction. Alan Dix, Janet Fincay, GreGoryd, Abowd, Russell Bealg, Pearson Education
2. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.
3. User Interface Design, Soren Lauesen, Pearson Education.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

BIG DATA ANALYTICS
(Open Elective-II)

M.Tech (IT) I Year - II Semester

Course Code: GR17D5185 L/T/P/C : 3/1/0/4

PREREQUISITES

- Students should have knowledge of one Programming Languages (Java preferably),
- Acquaintance with SQL (queries and sub queries)
- Exposure to Linux Environment.

COURSE OBJECTIVES: The objective of the course is to provide the student:

- Description about the big Data Platform and its use case.
- Demonstration of Apache Hadoop and analyzing data with Hadoop
- Explanation about HDFS and accessing HDFS
- First acquaintance about Map Reduce and illustration of Map Reduce jobs in IBM Environment
- Capability to design Big Sheets and its integration with Big SQL
- Inception about Pig and Hive Architecture
- Inception about HBase and HBase Architecture

COURSE OUTCOMES: At the end of the course the student will be able to:

- Analyze the Big Data Analytic techniques for useful Business Applications.
- List the capabilities of Hadoop and HDFS
- Describe the use of Map Reduce
- Manage Job Execution in Hadoop Environment
- Explore Big Data Eco Systems Pig, Hive and HBase in IBM environment
- Analyze IBM InfosphereBigInsights Big Data solutions • Explore Big Insights Big SQL, Big R, Big Sheets.

UNIT-I

INTRODUCTION TO BIG DATA AND HADOOP Introduction to BigData Platform – Big Data definition, Challenges of Conventional Systems : Enterprise/structured data, Social/unstructured Data, Unstructured data needs for Analytics, Analytics vs Reporting, Data Analytic Tools, History of Hadoop, Components of Hadoop, Analyzing the Data with Hadoop, Different Echosystems of Hadoop, IBM Big Data Platform Strategy and Introduction to InfosphereBigInsights.

UNIT-II

HDFS(Hadoop Distributed File System): Significance of HDFS in Hadoop,Design of HDFS, HDFS Architecture overview,5 daemons of Hadoop : Name Node, Data Node, Secondary Node, Job Tracker and Task Tracker, their functionality, Data Storage in HDFS : Introduction about Blocks, Data replication, Accessing HDFS : CLI(Command Line Interface) and admin commands.

How to store various types of data in HDFS using CLI-commands, Safe mode concepts in HDFS.

UNIT-III

Map Reduce Map Reduce Architecture,Map Reduce Programming Model, Map Reduce Java API, Anatomy of Map Reduce Job run, Failures, Job Scheduling, Sort & Shuffle phase, Task Execution. Map Reduce Program using IBM BigInsights. Adaptive Map Reduce. Introduction to Oozie, Overview of Managing job Execution. Apache Pig : Introduction to Apache Pig, Map Reduce Vs Apache Pig, SQL Vs Apache Pig, Pig Datatypes, Modes Of Execution in Pig.

UNIT-IV

Data Stores on Hadoop

Moving Data into Hadoop with Sqoop and Flume Hive : Introduction, architecture ,Integration with Hadoop, Hive Tables : Managed Tables, External Tables, Hive Query Language(Hive QL), load the data to Hive Tables Hbase :Introduction to HBase, Architecture, HBase Vs RDBMS, HBase UseCases Hmaster. Introduction to Zookeeper.

UNIT- V I

BM APPLICATIONS ON HADOOP

Big SQL : Introduction to Big SQL, Datatypes, Query Big SQL tables, Big SQL Statistics. **Big Sheets :** Introduction, Processing and Accessing BigSheets, Big SQL Integration. **Big R :** Architecture, API, Performance and Scalability Use cases.

TEXT BOOKS

1. Tom White " Hadoop: The Definitive Guide" Third Edit on, O'reily Media, 2012.

REFERENCE BOOKS

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 ", TataMcGraw Hill Publications, 2012.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

NEURAL AND FUZZY SYSTEMS
(Open Elective-II)

M.Tech (EEE) I Year - II Semester

Course Code: GR17D5186 L/T/P/C : 3/1/0/4

PRE–REQUISITE: Control Systems, Power Systems, Mathematics, Physics.

COURSE OBJECTIVES: The objective of the course is to provide the student

- To introduce the students with the concepts of learning methods.
- To provide students with the artificial neural networks and their architecture.
- To familiarize the students with the various applications of artificial neural networks.
- To introduce the concepts of the fuzzy logic control and their real time applications.

COURSE OUTCOMES: At the end of the course the student will be able to

- Define the advances in neural networks
- Evaluate the design and control of fuzzy systems.
- Articulate the applications of fuzzy control block sets.
- Evaluate the design of various models in neural networks
- To analyze the techniques of various types of neural networks
- Evaluate the design and control of associative memories
- Techniques to Design fuzzy logic system

UNIT-I

Introduction to Neural Networks: Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Hodgkin-Huxley Neuron Model, Integrate-and- Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN.

UNIT-II

Essentials of Artificial Neural Networks: Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Neural Dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules, Types of Application

Feed Forward Neural Networks

Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications.

UNIT-III

Multilayer Feed forward Neural Networks

Credit Assignment Problem, Generalized Delta Rule, Derivation of Backpropagation (BP) Training, Summary of Backpropagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

Associative Memories

Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory (Associative Matrix, Association Rules, Hamming Distance, The Linear Associator, Matrix Memories, Content Addressable Memory), Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function, Proof of BAM Stability Theorem Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis, Capacity of the Hopfield Network.

UNIT-IV

Self-Organizing Maps (SOM) and Adaptive Resonance Theory (ART)

Introduction, Competitive Learning, Vector Quantization, Self-Organized Learning Networks, Kohonen Networks, Training Algorithms, Linear Vector Quantization, Stability-Plasticity Dilemma, Feed forward competition, Feedback Competition.

UNIT-V

Classical and Fuzzy Sets and Fuzzy Logic System Components

Introduction to classical sets - properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions. Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

Applications Neural network applications: Process identification, Function Approximation, control and Process Monitoring, fault diagnosis and load forecasting.

Fuzzy logic applications: Fuzzy logic control and Fuzzy classification.

TEACHING METHODOLOGIES

1. White board
2. PPTs
3. Seminars

TEXT BOOK

1. Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications by Rajasekharan and G.A.VijayalakshmiPai – PHI Publication.

REFERENCE BOOKS

1. Introduction to Artificial Neural Systems - Jacek M. Zuarda, Jaico Publishing House, 1997.
2. Neural Engineering by C.Eliasmith and CH.Anderson, PHI
3. Neural Networks and Fuzzy Logic System by Bork Kosko, PHI Publications

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

PROJECT MANAGEMENT

M.Tech(Civil) I Year - II Semester

Course Code: GR17D5187 L/T/P/C : 3/1/0/4

COURSE OBJECTIVES: On completion of this Subject/Course, following objectives shall get accomplished

- To provide students about the basics of Management in general and Project Management in particular.
- To train the students about the Monitoring of Projects.
- To make understand the students about the Planning of projects.
- To make understand the students about the Scheduling of projects.
- To train the students about the drawing of CPM & PERT Networks.
- To train the students about teaching of Project Management to UG & PG students
- To motivate the students about the Research Development activities of Project Management which results in timely completion of projects without time and cost over runs.

Course outcomes: On completion of this Subject/Course the student shall be able to

- Perform the Project Management functions effectively.
- Plan the projects.
- Schedule the various activities of Projects.
- Monitor the actual progress with planned progress.
- Draw the CPM & PERT Networks/
- Handle Resources planning including levelling & smoothing.
- Interpret the Indian Contract Act and understand the litigations involved for better Contract Management.

UNIT- I

PROJECT PLANNING: Prime Objectives of Project Management, Main Functions of Project Management, Planning, Principles of Planning, Objectives of Planning, Steps involved in Planning, Stages of Planning, Advantages & limitations of Planning, Failures of Projects & Construction Projects.

UNIT-II

PROJECT SCHEDULING: Scheduling, Project/Construction Schedules, Steps involved in Scheduling, Methods of Scheduling, Bar Charts, Steps involved in Bar Charts, Limitations of Bar Charts, Milestone Charts and Limitations of Milestone Charts.

UNIT-III

PROJECT MONITORING: Network Techniques, Prime Objectives of Networks, Network Terminology, Types of Networks, CPM & PERT, Differences between CPM & PERT, Rules to draw the Network, Drawing of Networks, Advantages of Network , Critical Path, Float and its Types, Slack and Types of Slack.

UNIT-IV

PROJECT COST CONTROL: Direct Costs, Indirect Costs, Total Project Cost, Optimisation of Cost and Steps involved, Resources, Resources Smoothing and Resources Levelling, Crashing of Activities, Time and Cost Over runs of Project.

UNIT-V

PROJECT QUALITY & CONTRACTS:

Quality, Quality Control, Quality Assurance, Project Quality Plans in Construction Projects, Inspection & Test Plans, Method Statements, ISO Certification; Project Contracts, Contract Law, Types of Contracts and Indian Contract Act.

TEXT BOOKS

1. Project Planning and Control with PERT & CPM – BC Punmia, KK Khandielwala.
2. Project Scheduling & Monitoring in Practice – S Chowdhury

REFERENCE BOOKS

1. Project Management Handbook – Lock, Gower
2. Project Management – NJ Smith- Blackwell Publication.

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

HARDWARE - SOFTWARE CO-DESIGN
(Open Elective-II)

M.Tech (ECE) I Year - II Semester

Course Code: GR17D5188 L/T/P/C : 3/1/0/4

Course Objectives

- Describe an embedded system design flow from specification to physical realization
- Describe structural behavior of systems.
- Master complex systems.
- Devise new theories, techniques, and tools in design, implementation and testing.
- Master contemporary development techniques.

Course Outcomes: After going through this course the student will be able to

- Gain knowledge of contemporary issues and algorithms used.
- Know the interfacing components, different verification techniques and tools.
- Demonstrate practical skills in the construction of prototypes.
- Understand the use of modern hardware and software tools for building prototypes of embedded systems.
- Apply embedded software techniques to satisfy functional and response time requirements.
- Apply verification tools.
- Understand design representation for system level synthesis.

UNIT-I:

Co- Design Issues: Co- Design Models, Architectures, Languages, A Generic Co-design Methodology.

Co- Synthesis Algorithms:

Hardware software synthesis algorithms: hardware – software partitioning distributed system cosynthesis.

UNIT –II:

Prototyping and Emulation: Prototyping and emulation techniques, prototyping and emulation environments, future developments in emulation and prototyping architecture specialization techniques, system communication infrastructure

Target Architectures: Architecture Specialization techniques, System Communication infrastructure, Target Architecture and Application System classes, Architecture for control dominated systems (8051-Architectures for High performance control), Architecture for Data dominated systems (ADSP21060, TMS320C60), Mixed Systems.

UNIT-III

Compilation Techniques and Tools for Embedded Processor Architectures: Modern embedded architectures, embedded software development needs, compilation technologies, practical consideration in a compiler development environment.

UNIT-IV

Design Specification and Verification: Design, co-design, the co-design computational model, concurrency coordinating concurrent computations, interfacing components, design verification, implementation verification, verification tools, interface verification

UNIT-V

Languages for System – Level Specification and Design-I: System – level specification, design representation for system level synthesis, system level specification languages,

Languages for System – Level Specification and Design-II:

Heterogeneous specifications and multi language co-simulation, the cosyma system and lycos system.

TEXT BOOKS

1. Hardware / Software Co- Design Principles and Practice – Jorgen Staunstrup, Wayne Wolf –2009, Springer.
2. Hardware / Software Co- Design - Giovanni De Micheli, Mariagiovanna Sami, 2002, Kluwer Academic Publishers

REFERENCE BOOKS

1. A Practical Introduction to Hardware/Software Co-design -Patrick R. Schaumont - 2010 –Springer

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

NON CONVENTIONAL ENERGY RESOURCES

(Course Objectives)

M.Tech (ME) I Year - II Semester
Course Code: GR17D5189 L/T/P/C : 3/1/0/4

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

- Introduce the need of the non-convectional energy sources.
- Impart the role of non-convectional energy for the environment.
- Identify the energy resources utilization systems.
- Recognise the source and potential of wind energy and understand the classifications of wind mills.
- Summarize the principles of bio-conversion, ocean energy and geo thermal energy.

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

- Choose the appropriate renewable energy as an alternate for conventional power in any application.
- Analyze the environmental and cost economics of using renewable energy sources compared to fossil fuels.
- Apply the principles of various energy systems in day to day life.
- Analyze the industrial needs and convert theoretical model to practical circuits with wide range of specifications.
- Evaluate the importance of the renewable resources of energy as the fossil fuels are depleting in the world very fast express about clean and green energy for next generation.
- Analyse large scale demand of heat energy for meeting day to day domestic, institutional and industrial requirements can be met by utilizing solar thermal systems, biogas, PV cells, wind energy, Geothermal, MHD etc.
- Design the various techniques and models fabricated in utilizing the above said sources of energy.

UNIT-I

Introduction: Various non-conven tionalenergy resources-Introduction, availability, classification, relative merits and demerits.
Solar Cells: Theory of solarcells. solarcell materials, solarcellarray, solar callower plant, limitations.

UNIT-II

Solar Thermal Energy: Solar radiation, floatplane collectors and their materials, applications and performance, focusing of collectors and their materials, applications and performance; solar thermal power plants, thermal energy storage for solar heating and cooling, limitations.

UNIT-III

Geothermal Energy: Resources of geothermal energy, thermodynamics of geo-thermal energy conversion-electricalconversion, non-electricalconversion,environmentalconsiderations.
Magneto-hydrodynamics (MHD):
Principle of working of MHD Power plant, performance and limitations

FuelCells:

Principle of working of various type souffle cell sand their working, performance and limitations.

UNIT-IV

Thermos and the rmionic Conversions:
Principle of working, performance and limitations.
Wind Energy: Wind power and it surcease, sites election, criterion, momentum theory, classification of rotors, concentrations and augments, wind characteristics. Performance and limitation sofenergy conversion systems.

UNIT-V

Bio-mass: Availability of bio-massand its conversion theory.
Ocean Thermal Energy Conversion (OTEC):
Availability, theory and working principle, per formance and limitations.
Wave and Tida lWave:
Principle of working, performance and limitations.Waste RecyclingPlants.

TEXT/REFERENCESBOOKS

1. John Twideu and TonyWeir, “Renewal Energy Resources” BSP Publications, 2006.
2. M.V.R.KoteswaraRao, “Energy Resources: Conventional&Non-Conventional “ BSPPublications,2006.
3. D.S.Chauhan, ”Non-conventional Energy Resources” New Age International.
4. C.S. Solanki, “Renewal Energy Technologies: A Practical Guidefor Beginners” PHILearning.