IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM-606 201, KALLAKURICHI DISTRICT, TAMIL NADU, INDIA.
Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai.
2(f) Status of UGC, An ISO 9001: 2015 Certified Institution
A Christian Minority Institution run by the Franciscan Sisters of the Immaculate Heart of Mary Society, Puducherry.
Phone: 04151-258325, 258326
Website: www.iecw.edu.in   Email ID: idhaya@iecw.edu.in

1.3.2 Average percentage of courses that include experiential learning through project work/field work/ internship during last five years

ACADEMIC YEAR 2019-20

S.No	Name of the Programme	No. of Courses
1.	B.E - Computer Science and Engineering	25
2.	B.E - Electrical and Electronics Engineering	16
3.	B.E - Electronics and Communication Engineering	25
4.	B.Tech - Information Technology	7
5.	M.E - Computer Science and Engineering	9
6.	M.E – Communication Systems	7
	Total	89

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM-606 201, KALLAKURICHI DISTRICT, TAMIL NADU, INDIA.
Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai.
2(f) Status of UGC, An ISO 9001: 2015 Certified Institution
A Christian Minority Institution run by the Franciscan Sisters of the Immaculate Heart of Mary Society, Puducherry.
Phone: 04151-258325, 258326
Website: www.iecw.edu.in   Email ID: idhaya@iecw.edu.in

S.No	Program Name	Program Code	Course Code	Course Name	Project Work	Field Work	Internship
1.	B.E-CSE	104	HS8151	Communicative English	√	√	
2.	B.E-CSE	104	GE8151	Problem Solving and Python Programming	√		
3.	B.E-CSE	104	CS8251	Programming in C	√		
4.	B.E-CSE	104	CS8351	Digital Principles and System Design	√		
5.	B.E-CSE	104	CS8391	Data Structures	√		
6.	B.E-CSE	104	CS8392	Object Oriented Programming	√		
7.	B.E-CSE	104	EC8395	Communication Engineering	√	√	
8.	B.E-CSE	104	CS8491	Computer Architecture	√		
9.	B.E-CSE	104	CS8492	Database Management Systems	√		
10.	B.E-CSE	104	CS8451	Design and Analysis of Algorithms	√		
11.	B.E-CSE	104	CS8493	Operating Systems	√	√	
12.	B.E-CSE	104	CS8494	Software Engineering	√	√	
13.	B.E-CSE	104	CS8591	Computer Networks	√		
14.	B.E-CSE	104	CS8501	Theory of Computation	√		
15.	B.E-CSE	104	CS8592	Object Oriented Analysis and Design	√		
16.	B.E-CSE	104	CS8651	Internet Programming	√	√	
17.	B.E-CSE	104	CS8691	Artificial Intelligence	√		√
18.	B.E-CSE	104	CS8601	Mobile Computing	√	√	
19.	B.E-CSE	104	CS8602	Compiler Design	√		
20.	B.E-CSE	104	CS8603	Distributed Systems	√		
21.	B.E-CSE	104	IT8076	Software Testing	√	√	
22.	B.E-CSE	104	CS6703	Grid and Cloud Computing	√		
23.	B.E-CSE	104	CS6003	Ad hoc and Sensor Networks	√		
24.	B.E-CSE	104	EC6703	Embedded and Real Time Systems	√	√	
25.	B.E-CSE	104	CS6008	Human Computer Interaction	√		
26.	B.E-EEE	105	EE8351	Digital Logic Circuits	√		
27.	B.E-EEE	105	EE8391	Electromagnetic Theory	√		
28.	B.E-EEE	105	EE8301	Electrical Machines - I	√	√	
29.	B.E-EEE	105	EC8353	Electron Devices and Circuits	√		
30.	B.E-EEE	105	EE8401	Electrical Machines - II	√		
31.	B.E-EEE	105	EE8402	Transmission and Distribution	√	√	
32.	B.E-EEE	105	EE8403	Measurements and Instrumentation	√		
33.	B.E-EEE	105	EE8501	Power System Analysis	√		
34.	B.E-EEE	105	EE8552	Power Electronics	√		
35.	B.E-EEE	105	EE8601	Solid State Drives	√		

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM-606 201, KALLAKURICHI DISTRICT, TAMIL NADU, INDIA.
Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai.
2(f) Status of UGC, An ISO 9001: 2015 Certified Institution
A Christian Minority Institution run by the Franciscan Sisters of the Immaculate Heart of Mary Society, Puducherry.
Phone: 04151-258325, 258326
Website: www.iecw.edu.in   Email ID: idhaya@iecw.edu.in

36.	B.E-EEE	105	EE8602	Protection and Switchgear	√		
37.	B.E-EEE	105	EE8691	Embedded Systems	√		√
38.	B.E-EEE	105	EE8002	Design of Electrical Apparatus	√		
39.	B.E-EEE	105	EE8006	Power Quality	√		
40.	B.E-EEE	105	EE6801	Electric Energy Generation, Utilization and Conservation	√		
41.	B.E-EEE	105	EE6010	High Voltage Direct Current Transmission	√		
42.	B.E-ECE	106	BE8254	Basic Electrical and Instrumentation Engineering	√	√	
43.	B.E-ECE	106	EC8252	Electronic Devices	√		
44.	B.E-ECE	106	EC8351	Electronic Circuits- I	√		
45.	B.E-ECE	106	EC8352	Signals and Systems	√		
46.	B.E-ECE	106	EC8392	Digital Electronics	√		
47.	B.E-ECE	106	EC8391	Control Systems Engineering	√		
48.	B.E-ECE	106	EC8452	Electronic Circuits II	√		
49.	B.E-ECE	106	EC8491	Communication Theory	√	√	
50.	B.E-ECE	106	EC8451	Electromagnetic Fields	√		
51.	B.E-ECE	106	EC8453	Linear Integrated Circuits	√		
52.	B.E-ECE	106	EC8501	Digital Communication	√		√
53.	B.E-ECE	106	EC8553	Discrete-Time Signal Processing	√		
54.	B.E-ECE	106	EC8552	Computer Architecture and Organization	√		
55.	B.E-ECE	106	EC8551	Communication Networks	√	√	
56.	B.E-ECE	106	EC8095	VLSI Design	√		
57.	B.E-ECE	106	EC8652	Wireless Communication	√		
58.	B.E-ECE	106	EC8651	Transmission Lines and RF Systems	√		
59.	B.E-ECE	106	EC8004	Wireless Networks	√		
60.	B.E-ECE	106	EC6701	RF and Microwave Engineering	√		
61.	B.E-ECE	106	EC6702	Optical Communication and Networks	√		
62.	B.E-ECE	106	IT6005	Digital Image Processing	√		
63.	B.E-ECE	106	EC6011	Advanced Computer Architecture	√		
64.	B.E-ECE	106	EC6016	Opto Electronic Devices	√		
65.	B.E-ECE	106	EC6801	Wireless Communication	√		
66.	B.E-ECE	106	EC6802	Wireless Networks	√		
67.	B.Tech-IT	205	IT8201	Information Technology Essentials	√		
68.	B.Tech-IT	205	EC8394	Analog and Digital Communication	√	√	
69.	B.Tech-IT	205	IT8501	Web Technology	√	√	
70.	B.Tech-IT	205	IT8601	Computational Intelligence	√		
71.	B.Tech-IT	205	IT8602	Mobile Communication	√		

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM-606 201, KALLAKURICHI DISTRICT, TAMIL NADU, INDIA.
Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai.
2(f) Status of UGC, An ISO 9001: 2015 Certified Institution
A Christian Minority Institution run by the Franciscan Sisters of the Immaculate Heart of Mary Society, Puducherry.
Phone: 04151-258325, 258326

Website: www.iecw.edu.in   Email ID: idhaya@iecw.edu.in

72.	B.Tech-IT	205	CS8091	Big Data Analytics	√		
73.	B.Tech-IT	205	CS8092	Computer Graphics Multimedia	√		
74.	M.E-CSE	405	IT6702	Advanced Data Structures and Algorithms	√		
75.	M.E-CSE	405	CP5191	Machine Learning Techniques	√		
76.	M.E-CSE	405	CP5201	Network Design and Technologies	√		
77.	M.E-CSE	405	CP5292	Internet of Things	√		
78.	M.E-CSE	405	CP5293	Big Data Analytics	√		
79.	M.E-CSE	405	CP5092	Cloud Computing Technologies	√		
80.	M.E-CSE	405	CP5005	Software Quality Assurance and Testing	√		
81.	M.E-CSE	405	CP5073	Embedded Software Development	√		
82.	M.E-CSE	405	CP5097	Mobile Application Development	√		
83.	M.E-CS	403	CU5191	Advanced Radiation Systems	√		
84.	M.E-CS	403	CU5151	Advanced Digital Communication Techniques	√		
85.	M.E-CS	403	AP5152	Advanced Digital Signal Processing	√		
86.	M.E-CS	403	CU5091	Advanced Satellite Communication and Navigation Systems	√		
87.	M.E-CS	403	CU5291	Advanced Wireless Communication Systems	√		
88.	M.E-CS	403	DS5291	Advanced Digital Image processing	√		
89.	M.E-CS	403	NC5291	Communication Network Security	√		

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

	HS8151	COMMUNICATIVE ENGLISH	L	T	P	C
			4	0	0	4

OBJECTIVES:

- To develop the basic reading and writing skills of first year engineering and technology students.
- To help learners develop their listening skills, which will, enable them listen to lectures andcomprehend them by asking questions; seeking clarifications.
- To help learners develop their speaking skills and speak fluently in real contexts.
- To help learners develop vocabulary of a general kind by developing their reading skills

UNIT I   SHARING INFORMATION RELATED TO ONESELF/FAMILY& FRIENDS   12

Reading- short comprehension passages, practice in skimming-scanning and predicting- Writing- completing sentences- - developing hints. Listening- short texts- short formal and informal conversations. Speaking- introducing oneself - exchanging personal information- Language development- Wh- Questions- asking and answering-yes or no questions- parts of speech. Vocabulary development-- prefixes- suffixes- articles.- count/ uncount nouns.

UNIT II   GENERAL READING AND FREE WRITING   12

Reading - comprehension-pre-reading-post reading- comprehension questions (multiple choice questions and /or short questions/ open-ended questions)-inductive reading- short narratives and descriptions from newspapers including dialogues and conversations (also used as short Listening texts)- register- Writing – paragraph writing- topic sentence- main ideas- free writing, short narrative descriptions using some suggested vocabulary and structures –Listening- telephonic conversations. Speaking – sharing information of a personal kind—greeting – taking leave- Language development– prepositions, conjunctions Vocabulary development- guessing meanings of words in context.

UNIT III   GRAMMAR AND LANGUAGE DEVELOPMENT   12

Reading- short texts and longer passages (close reading) Writing- understanding text structure- use of reference words and discourse markers-coherence-jumbled sentences Listening — listening to longer texts and filling up the table- product description- narratives from different sources. Speaking- asking about routine actions and expressing opinions. Language development- degrees of comparison- pronouns- direct vs indirect questions- Vocabulary development – single word substitutes- adverbs.

UNIT IV   READING AND LANGUAGE DEVELOPMENT   12

Reading- comprehension-reading longer texts- reading different types of texts- magazines Writing- letter writing, informal or personal letters-e-mails-conventions of personal email- Listening- listening to dialogues or conversations and completing exercises based on them. Speaking- speaking about oneself- speaking about one's friend- Language development- Tenses- simple present-simple past- present continuous and past continuous- Vocabulary development- synonyms-antonyms- phrasal verbs

UNIT V   EXTENDED WRITING   12

Reading- longer texts- close reading –Writing- brainstorming -writing short essays – developing an outline- identifying main and subordinate ideas- dialogue writing-Listening — listening to talks- conversations- Speaking – participating in conversations- short group conversations-Language development-modal verbs- present/ past perfect tense - Vocabulary development-collocations- fixed and semi-fixed expressions

TOTAL: 60 PERIODS

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

- Read articles of a general kind in magazines and newspapers.
- Participate effectively in informal conversations; introduce themselves and their friends andexpress opinions in English.
- Comprehend conversations and short talks delivered in English
- Write short essays of a general kind and personal letters and emails in English.

TEXT BOOKS:

1. Board of Editors. Using English A Coursebook for Undergarduate Engineers andTechnologists. Orient BlackSwan Limited, Hyderabad: 2015
2. Richards, C. Jack. Interchange Students' Book-2 New Delhi: CUP, 2015.

REFERENCES

1. Bailey, Stephen. Academic Writing: A practical guide for students. New York:Rutledge,2011.
2. Comfort,   Jeremy,   et   al.   Speaking Effectively   :   Developing   Speaking Skillsfor BusinessEnglish. Cambridge University Press, Cambridge: Reprint 2011
3. Dutt P. Kiranmai and RajeevanGeeta. Basic Communication Skills, Foundation Books:2013
4. Means,L. Thomas and Elaine Langlois. English & Communication For Colleges. Cengage Learning ,USA: 2007
5. Redston, Chris &Gillies Cunningham Face2Face (Pre-intermediate Student's Book& Workbook) Cambridge University Press, New Delhi: 2005

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.;
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

NextGen Solutions

(ISO : 9001: 2015 Certified Institute)

(Accredited by International Standards Accreditation Council)

(Accredited by Tamilnadu Skill Development Corporation)

Corporate Etiquette & Quantitative Aptitude

This is to certify that

JESTIN JEEVA Y

Congratulations on successfully completing the 2 days training on Corporate Etiquette & Quantitative Aptitude Conducted by NextGen Solutions in association with Khan's Training Academy on 23/12/2019 & 24/12/2019.

Nayeem A Khan

Nayeem A Khan

HR Manager, Khan's Training Academy, Chennai

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,

PRINCIPAL

IDHAYA ENGG. COLLEGE FOR WOMEN

CHINNASALEM-606 201. KALLAKURICHI DT.

NextGen Solutions

(ISO : 9001: 2015 Certified Institute)

(Accredited by International Standards Accreditation Council)

(Accredited by Tamilnadu Skill Development Corporation)

Corporate Etiquette & Quantitative Aptitude

This is to certify that

SNEHA V

Congratulations on successfully completing the 2 days training on Corporate Etiquette & Quantitative Aptitude Conducted by NextGen Solutions in association with Khan's Training Academy on 23/12/2019 & 24/12/2019.

Nayeem A Khan

Nayeem A Khan

HR Manager, Khan's Training Academy, Chennai

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-806 201, KALLAKURICHI DT.

NextGen Solutions

(ISO : 9001: 2015 Certified Institute)
(Accredited by International Standards Accreditation Council)
(Accredited by Tamilnadu Skill Development Corporation)

Corporate Etiquette & Quantitative Aptitude

This is to certify that

YAMUNASRI S

Congratulations on successfully completing the 2 days training on Corporate Etiquette & Quantitative Aptitude Conducted by NextGen Solutions in association with Khan's Training Academy on 23/12/2019 & 24/12/2019.

Nayeem A Khan

Nayeem A Khan

HR Manager, Khan's Training Academy, Chennai

Dr.R.GURUMANI, M.E Ph.D.,M.B.A. M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COL. FOR WOMEN
CHINNASALEM

CS8651	INTERNET PROGRAMMING	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand different Internet Technologies.
- To learn java-specific web services architecture

UNIT I   WEBSITE BASICS, HTML 5, CSS 3, WEB 2.0   9

Web Essentials: Clients, Servers and Communication – The Internet – Basic Internet protocols – World wide web – HTTP Request Message – HTTP Response Message – WebClients – Web Servers – HTML5 – Tables – Lists – Image – HTML5 control elements –Semantic elements – Drag and Drop – Audio – Video controls - CSS3 – Inline, embedded and external style sheets – Rule cascading – Inheritance – Backgrounds – Border Images – Colors – Shadows – Text – Transformations – Transitions – Animations.   .

UNIT II   CLIENT SIDE PROGRAMMING   9

Java Script: An introduction to JavaScript–JavaScript DOM Model-Date and Objects,- Regular Expressions- Exception Handling-Validation-Built-in objects-Event Handling- DHTML with JavaScript- JSON introduction – Syntax – Function Files – Http Request –SQL.

UNIT III   SERVER SIDE PROGRAMMING   9

Servlets: Java Servlet Architecture- Servlet Life Cycle- Form GET and POST actions- Session Handling- Understanding Cookies- Installing and Configuring Apache Tomcat Web Server- DATABASE CONNECTIVITY: JDBC perspectives, JDBC program example - JSP: Understanding Java Server Pages-JSP Standard Tag Library (JSTL)-Creating HTML forms by embedding JSP code.

UNIT IV   PHP and XML   9

An introduction to PHP: PHP- Using PHP- Variables- Program control- Built-in functions-Form Validation- Regular Expressions - File handling – Cookies - Connecting to Database.
XML: Basic XML- Document Type Definition- XML Schema DOM and Presenting XML, XMLParsers and Validation, XSL and XSLT Transformation, News Feed (RSS and ATOM).

**   9**

UNIT V   INTRODUCTION TO AJAX and WEB SERVICES
AJAX: Ajax Client Server Architecture-XML Http Request Object-Call Back Methods; Web Services: Introduction- Java web services Basics — Creating, Publishing, Testing and Describing a Web services (WSDL)-Consuming a web service, Database Driven web service from an application –SOAP.

TOTAL   45   PERIODS

OUTCOMES:
At the end of the course, the students should be able to:

- Construct a basic website using HTML and Cascading Style Sheets.
- Build dynamic web page with validation using Java Script objects and by applyingdifferent event handling mechanisms.
- Develop server side programs using Servlets and JSP.
- Construct simple web pages in PHP and to represent data in XML format.
- Use AJAX and web services to develop interactive web applications

TEXT BOOK:

1. Deitel and Deitel and Nieto, —Internet and World Wide Web - How to Program‖,Prentice Hall, 5th Edition, 2011.

REFERENCES:

1. Stephen Wynkoop and John Burke —Running a Perfect Website‖, QUE, 2ndEdition,1999.
2. Chris Bates, Web Programming – Building Intranet Applications, 3rd Edition, Wiley Publications, 2009.
3. Jeffrey C and Jackson, —Web Technologies A Computer Science Perspective‖,Pearson Education, 2011.
4. Gopalan N.P. and Akilandeswari J., —Web Technology‖, Prentice Hall of India, 2011.
5. UttamK.Roy, —Web Technologies‖, Oxford University Press, 2011.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CS8691	ARTIFICIAL INTELLIGENCE	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the various characteristics of Intelligent agents
- To learn the different search strategies in AI
- To learn to represent knowledge in solving AI problems
- To understand the different ways of designing software agents
- To know about the various applications of AI.

UNIT I   INTRODUCTION   9

Introduction–Definition - Future of Artificial Intelligence – Characteristics of Intelligent Agents–Typical Intelligent Agents – Problem Solving Approach to Typical AI problems.

UNIT II   PROBLEM SOLVING METHODS   9

Problem solving Methods - Search Strategies- Uninformed - Informed - Heuristics - Local Search Algorithms and Optimization Problems - Searching with Partial Observations - Constraint Satisfaction Problems — Constraint Propagation - Backtracking Search - Game Playing – Optimal Decisions in Games – Alpha - Beta Pruning - Stochastic Games

UNIT III   KNOWLEDGE REPRESENTATION   9

First Order Predicate Logic – Prolog Programming – Unification – Forward Chaining-Backward Chaining – Resolution – Knowledge Representation - Ontological Engineering-Categories and Objects – Events - Mental Events and Mental Objects - Reasoning Systems for Categories - Reasoning with Default Information.

UNIT IV   SOFTWARE AGENTS   9

Architecture for Intelligent Agents – Agent communication – Negotiation and Bargaining –Argumentation among Agents – Trust and Reputation in Multi-agent systems.

UNIT V   APPLICATIONS   9

AI applications – Language Models – Information Retrieval- Information Extraction – Natural Language Processing - Machine Translation – Speech Recognition – Robot – Hardware – Perception — Planning — Moving

TOTAL :45 PERIODS

OUTCOMES:

Upon completion of the course, the students will be able to:

- Use appropriate search algorithms for any AI problem
- Represent a problem using first order and predicate logic
- Provide the apt agent strategy to solve a given problem
- Design software agents to solve a problem
- Design applications for NLP that use Artificial Intelligence.

TEXT BOOKS:

1   S. Russell and P. Norvig, "Artificial Intelligence: A Modern Approach‖, Prentice Hall, ThirdEdition, 2009.

2   I. Bratko, ―Prolog: Programming for Artificial Intelligence‖, Fourth edition, Addison-WesleyEducational Publishers Inc., 2011.

REFERENCES:

1.   M. Tim Jones, ―Artificial Intelligence: A Systems Approach(Computer Science)‖, Jonesand Bartlett Publishers, Inc.; First Edition, 2008

2.   Nils J. Nilsson, ―The Quest for Artificial Intelligence‖, Cambridge University Press, 2009.

3.   William F. Clocksin and Christopher S. Mellish,‖ Programming in Prolog: Using the ISOStandard‖, Fifth Edition, Springer, 2003.

4.   Gerhard Weiss, ―Multi Agent Systems‖, Second Edition, MIT Press, 2013.

5.   David L. Poole and Alan K. Mackworth, ―Artificial Intelligence: Foundations ofComputational Agents‖, Cambridge University Press, 2010.

BAROLA™ TECHNOLOGIES

ISO 9001:2015
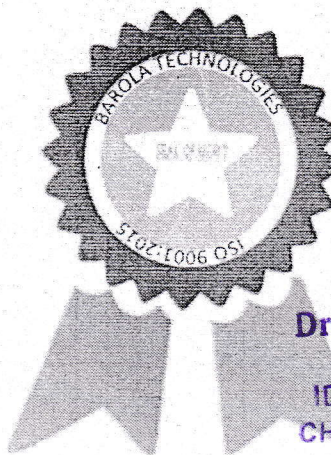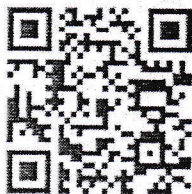
This is to certify that Mr / Ms

SARULATHA · K

has attended and successfully completed

07 Day's Artificial Intelligence Internship During June-2019
at Our Research, Development &
Training Facility, Chennai.

Head Technical Wing

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

\<codeb!nd/\>™
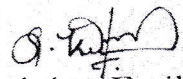## {Technologies}
Solution Without Compromise!

107, Usman Road, T.Nagar, Chennai
Opposite to The Chennai Silks
+91 9789 617 617, 9789 817 717
www.codebindtechnologies.com
info@codebindtechnologies.com

CERTIFICATE OF COMPLETION

CERTIFICATE NUMBER CBTIPC 292005191101

This certificate is awarded to ___SOWBARNIKA · A___,
who has undergone Inplant Training in ___WEB DEVELOPMENT___,
from ___29·11·2019___ to ___03·12·2019___ at CodeBind Technologies,
Chennai. During the course of training period, the conduct of the
trainee was found to be ___GOOD___.

Training Facilitator

Issuing Authority

🏠 Head Office : T.Nagar, Chennai.   Branch Office : Coimbatore. Trichy.   044 - 4330 4239

Dr.R.GURUMANI, M.E., Ph.D., M.B.A., M.ISTE., F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201, KALLAKURICHI DT.

<codeb!nd/>™
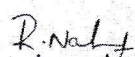## {Technologies}
Solution Without Compromise

CERTIFICATE OF COMPLETION

CERTIFICATE NUMBER | CBTTIPC 042005 191216 |

This certificate is awarded to ___K·SABULATHA___,
who has undergone Inplant Training in ___WEBDEVELOPMENT___,
from __04·12·2019__ to __08·12·2019__ at CodeBind Technologies, Trichy.
During the course of training period, the conduct of the trainee
was found to be __GOOD.__.

Training Facilitator

Issuing Authority

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

<codeb!nd/>™
{Technologies}
Solution Without Compromise!

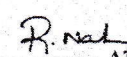## CERTIFICATE OF COMPLETION

CERTIFICATE NUMBER | CBTTIPC 072005 19 1206

This certificate is awarded to _____C. MATHESHWARI_____,

who has undergone Inplant Training in _____WEB DEVELOPMENT_____,

from __07·12·2019__ to __11·12·2019__ at CodeBind Technologies, Trichy.

During the course of training period, the conduct of the trainee

was found to be _____Good·_____.

Training Facilitator

Issuing Authority

Dr.R.GURUMANI, M.E., Ph.D., M.B.A., M.ISTE., F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CS8493	OPERATING SYSTEMS	L T P C
		3 0 0 3

OBJECTIVES:

- To understand the basic concepts and functions of operating systems.
- To understand Processes and Threads
- To analyze Scheduling algorithms.
- To understand the concept of Deadlocks.
- To analyze various memory management schemes.
- To understand I/O management and File systems.
- To be familiar with the basics of Linux system and Mobile OS like iOS and Android.

UNIT I   OPERATING SYSTEM OVERVIEW   7

Computer System Overview-Basic Elements, Instruction Execution, Interrupts, Memory Hierarchy, Cache Memory, Direct Memory Access, Multiprocessor and Multicore Organization. Operating system overview-objectives and functions, Evolution of Operating System.- Computer System Organization Operating System Structure and Operations- System Calls, System Programs, OS Generation and System Boot.

UNIT II   PROCESS MANAGEMENT   11

Processes - Process Concept, Process Scheduling, Operations on Processes, Inter-process Communication; CPU Scheduling - Scheduling criteria, Scheduling algorithms, Multiple-processor scheduling, Real time scheduling; Threads- Overview, Multithreading models, Threading issues; Process Synchronization - The critical-section problem, Synchronization hardware, Mutex locks, Semaphores, Classic problems of synchronization, Critical regions, Monitors; Deadlock - System model, Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock.

UNIT III   STORAGE MANAGEMENT   9

Main Memory – Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation, Segmentation with paging, 32 and 64 bit architecture Examples; Virtual Memory — Background, Demand Paging, Page Replacement, Allocation, Thrashing; Allocating Kernel Memory, OS Examples.

UNIT IV   FILE SYSTEMS AND I/O SYSTEMS   9

Mass Storage system — Overview of Mass Storage Structure, Disk Structure, Disk Scheduling and Management, swap space management; File-System Interface - File concept, Access methods, Directory Structure, Directory organization, File system mounting, File Sharing and Protection; File System Implementation- File System Structure, Directory implementation, Allocation Methods, Free Space Management, Efficiency and Performance, Recovery; I/O Systems — I/O Hardware, Application I/O interface, Kernel I/O subsystem, Streams, Performance.

UNIT V   CASE STUDY   9

Linux System - Design Principles, Kernel Modules, Process Management, Scheduling, Memory Management, Input-Output Management, File System, Inter-process Communication; Mobile OS - iOS and Android - Architecture and SDK Framework, Media Layer, Services Layer, Core OSLayer, File System.

TOTAL : 45 PERIODS

OUTCOMES:
At the end of the course, the students should be able to:

- Analyze various scheduling algorithms.
- Understand deadlock, prevention and avoidance algorithms.
- Compare and contrast various memory management schemes.
- Understand the functionality of file systems.
- Perform administrative tasks on Linux Servers.
- Compare iOS and Android Operating Systems.

TEXT BOOK :
1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, ―Operating System Concepts‖,9th Edition, John Wiley and Sons Inc., 2012.

REFERENCES :
1. Ramaz Elmasri, A. Gil Carrick, David Levine, ―Operating Systems – A Spiral Approach‖,Tata McGraw Hill Edition, 2010.
2. Achyut S.Godbole, Atul Kahate, ―Operating Systems‖, McGraw Hill Education, 2016.
3. Andrew S. Tanenbaum, ―Modern Operating Systems‖, Second Edition, PearsonEducation, 2004.
4. Gary Nutt, ―Operating Systems‖, Third Edition, Pearson Education, 2004.
5. Harvey M. Deitel, ―Operating Systems‖, Third Edition, Pearson Education, 2004.
6. Daniel P Bovet and Marco Cesati, ―Understanding the Linux kernel‖, 3rd edition, O‘Reilly,2005.
7. Neil Smyth, ―iPhone iOS 4 Development Essentials – Xcode‖, Fourth Edition, Payload media,2011.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

27/02/2020

From

Mr.J.Jayantharam,

Managing Director,

NextGen Solutions,

Cuddalore .

To

The Head of the Department,

Computer Science,

Idhaya Engineering College for Women,

Chinnasalem.

Respected Sir,

This is for your confirmation that student of second year and third year of Computer Science and Information Technology has visited our company on 27.02.2020 (Thursday).And the students have learnt about Web Design and Android Development. On behalf of our Organization we wish them all the best for their future endeavour.

Thanking You,

Yours Faithfully,

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

J.Jayantharam

NEXTGEN SOLUTIONS
CUDDALORE - 607 001

COMMUNICATION ENGINEERING L T P C

3 0 0 3

OBJECTIVES:

- To introduce the relevance of this course to the existing technology through demonstrations, case studies, simulations, contributions of scientist, national/international policies with a futuristic vision along with socio-economic impact and issues
- To study the various analog and digital modulation techniques
- To study the principles behind information theory and coding
- To study the various digital communication techniques

UNIT I   ANALOG MODULATION 9

Amplitude Modulation – AM, DSBSC, SSBSC, VSB – PSD, modulators and demodulators – Angle modulation – PM and FM – PSD, modulators and demodulators – Superheterodyne receivers

UNIT II   PULSE MODULATION 9

Low pass sampling theorem — Quantization — PAM — Line coding — PCM, DPCM, DM, and ADPCM And ADM, Channel Vocoder - Time Division Multiplexing, Frequency Division Multiplexing

UNIT III   DIGITAL MODULATION AND TRANSMISSION 9

Phase shift keying – BPSK, DPSK, QPSK – Principles of M-ary signaling M-ary PSK & QAM – Comparison, ISI – Pulse shaping – Duo binary encoding – Cosine filters – Eye pattern, equalizers

UNIT IV   INFORMATION THEORY AND CODING 9

Measure of information – Entropy – Source coding theorem – Shannon–Fano coding, Huffman Coding, LZ Coding – Channel capacity – Shannon-Hartley law – Shannon's limit – Error control codes – Cyclic codes, Syndrome calculation – Convolution Coding, Sequential and Viterbi decoding

UNIT V   SPREAD SPECTRUM AND MULTIPLE ACCESS 9

PN sequences — properties — m-sequence — DSSS — Processing gain, Jamming — FHSS — Synchronisation and tracking – Multiple Access – FDMA, TDMA, CDMA,

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Ability to comprehend and appreciate the significance and role of this course in the present contemporary world
- Apply analog and digital communication techniques.
- Use data and pulse communication techniques.
- Analyze Source and Error control coding.

TEXT BOOKS:

1. H Taub, D L Schilling, G Saha, —Principles of Communication Systems‖ 3/e, TMH 2007
2. S. Haykin —Digital Communications‖ John Wiley 2005

REFERENCES:

1. B.P.Lathi, —Modern Digital and Analog Communication Systems‖, 3rd edition, Oxford University Press, 2007
2. H P Hsu, Schaum Outline Series – —Analog and Digital Communications‖ TMH 2006
3. B.Sklar, Digital Communications Fundamentals and Applications‖ 2/e Pearson Education 2007.

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

◢◣ Gmail

karthikeyan vadivel <karthikeyaniecw@gmail.com>

Industrial Visit - Idhaya Engg college for women

Antuvan DS <ds_antuvan@vssc.gov.in>   Mon, Jul 8, 2019 at 10:25 AM
To: karthikeyan vadivel <karthikeyaniecw@gmail.com>

Dear Prof.Karthikeyan,

Nice to see your letter and the interest of your students undertaking a visit to VSSC/ISRO.

You are most welcome to come over here and we shall orange necessary pass for the visit.

I hope to be there with your team after return from Chandrayaan-II launch at Shriharikota.
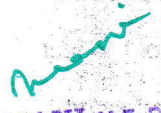
Regads

DS Antuvan

Senior Scientist, VSSC/ISRO

[Quoted text hidden]

📄 **ISRO-IV.pdf**
927K

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

IDHAYA ENGINEERING COLLEGE FOR WOMEN

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.
An ISO 9001 : 2015 Certified Institution
(A Unit of the Franciscan Sisters of the Immaculate Heart of Mary Society, Pondicherry)

Date: 5/07/19

REF: IECW / ADM / IND.VISIT / 2019

To

Shri. D. S. Antuvan,
Senior Scientist,
Vikram Sarabhai Space Centre,
Thiruvananthapuram,
Kerala, India, Pin Code:695022

Sir,

Sub: Request for permission to visit your Research center – Final year CSE,
EEE, ECE & IT students – Reg.

Greetings from Idhaya Engineering College for Women, Chinnasalem.

Idhaya Engineering College for Women is established and managed by Franciscan Sister of the Immaculate Heart of Mary Congregation to provide quality technical and professional education to the deserving women candidates. As a part of their regular curricular activities, every student has to undergo one industrial visit for every theory course offered. Our students of 4th year CSE, EEE, ECE & IT are very much interested to visit your center. So I am writing this letter to seek permission to visit preferably on 17th July, 2019.

Kindly give an orientation of the various facilities available at your center and we would be grateful for the same. We hope for your positive response at the earliest.

Total No. of students : 89

No. of staff members accompanying : 06

Thank you

Yours faithfully

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGINEERING COLLEGE FOR WOMEN
CHINNASALEM-606 201. VILLUPURAM DIST.

Chinnasalem - 606 201, Villupuram District, Tamil Nadu.

REF: IECW / CSE, EEE, ECE & IT / IV / 2019

Date: 25.07.2019

Department of CSE, EEE, ECE and IT

Place: Kerala

Days: (17th to 19th July 2019)

Industrial Visit and Educational tour Report

IECW organized a 3 days Industrial Visit and Educational Tour to ISRO, Trivandrum, from 17.07.2019 to 19.07.2019 for final year Students of CSE, EEE, ECE and IT department. The tour was organized with the prior permission and guidance from Principal. This tour gave a wide expo to the students. Totally 87 students along with 6 faculty member had joined in this grand endeavour.

DAY 1 (17/07/2019) –ISRO-Trivandrum

Visited Rocket launching at 12.00 p.m, Kovalam beach and Sree Padmanabhaswamy Temple.

DAY 2 (18/07/2019) –Kerala

Visited Thirparappu falls, Padmanabhaswamy palace and Church

DAY 3 (19/07/2019) – Kanyakumari

Visited Sunrise,Vivenkanda rock,Thiruvalluvar statue and Madurai meenachi amman temple.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.It.
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT

IV COORDINATOR

GE8151   **PROBLEM SOLVING AND PYTHON PROGRAMMING**   **L T P C**
                                                                                       3 0 0 3

OBJECTIVES:

- ☐   To know the basics of algorithmic problem solving
- ☐   To read and write simple Python programs.
- ☐   To develop Python programs with conditionals and loops.
- ☐   To define Python functions and call them.
- ☐   To use Python data structures –- lists, tuples, dictionaries.
- ☐   To do input/output with files in Python.

UNIT I   ALGORITHMIC PROBLEM SOLVING   **9**
Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert acard in a list of sorted cards, guess an integer number in a range, Towers of Hanoi.

UNIT II   DATA, EXPRESSIONS, STATEMENTS   **9**
Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT III   CONTROL FLOW, FUNCTIONS   **9**
Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

UNIT IV   LISTS, TUPLES, DICTIONARIES   **9**
Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing - list comprehension; Illustrative programs: selection sort,insertion sort, merge sort, histogram.

UNIT V   FILES, MODULES, PACKAGES   **9**
Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file.

                                                                      TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, students will be able to

- ☐   Develop algorithmic solutions to simple computational problems
- ☐   Read, write, execute by hand simple Python programs..
- ☐   Decompose a Python program into functions.
- ☐   Represent compound data using Python lists, tuples, dictionaries.
- ☐   Read and write data from/to files in Python Programs.

TEXT BOOKS:
1. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist´´, 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016 (http://greenteapress.com/wp/think-python/)
2. Guido van Rossum and Fred L. Drake Jr, ―An Introduction to Python – Revised andupdated for Python 3.2, Network Theory Ltd., 2011.

REFERENCES:
1. John V Guttag, ―Introduction to Computation and Programming Using Python´´, Revisedand expanded Edition, MIT Press , 2013
2. Robert Sedgewick, Kevin Wayne, Robert Dondero, ―Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
3. Timothy A. Budd, ―Exploring Python‖, Mc-Graw Hill Education (India) Private Ltd.,, 2015.
4. Kenneth A. Lambert, ―Fundamentals of Python: First Programs‖, CENGAGE Learning,2012.
5. Charles Dierbach, ―Introduction to Computer Science using Python: A ComputationalProblem-Solving Focus, Wiley India Edition, 2013
6. Paul Gries, Jennifer Campbell and Jason Montojo, Practical Programming: An Introductionto Computer Science using Python 3‖, Second edition, Pragmatic Programmers, LLC, 2013.

CS8251	PROGRAMMING IN C	L T P C
		3 0 0 3

OBJECTIVES:
- To develop C Programs using basic programming constructs
- To develop C programs using arrays and strings
- To develop applications in C using functions , pointers and structures
- To do input/output and file handling in C

UNIT I   BASICS OF C PROGRAMMING   9

Introduction to programming paradigms - Structure of C program - C programming: Data Types –Storage classes - Constants – Enumeration Constants - Keywords – Operators: Precedence and Associativity - Expressions - Input/Output statements, Assignment statements – Decision making statements - Switch statement - Looping statements – Pre-processor directives - Compilation process

UNIT II   ARRAYS AND STRINGS   9

Introduction to Arrays: Declaration, Initialization – One dimensional array – Example Program: Computing Mean, Median and Mode - Two dimensional arrays — Example Program: Matrix Operations (Addition, Scaling, Determinant and Transpose) - String operations: length, compare, concatenate, copy – Selection sort, linear and binary search

UNIT III   FUNCTIONS AND POINTERS   9

Introduction to functions: Function prototype, function definition, function call, Built-in functions (string functions, math functions) – Recursion – Example Program: Computation of Sine series, Scientific calculator using built-in functions, Binary Search using recursive functions – Pointers –Pointer operators — Pointer arithmetic — Arrays and pointers — Array of pointers — Example Program: Sorting of names – Parameter passing: Pass by value, Pass by reference – Example Program: Swapping of two numbers and changing the value of a variable using pass by reference.UNIT IV   STRUCTURES   9

Structure - Nested structures – Pointer and Structures – Array of structures – Example Program using structures and pointers – Self referential structures – Dynamic memory allocation - Singlylinked list - typedef

UNIT V   FILE PROCESSING   9

Files — Types of file processing: Sequential access, Random access — Sequential access file - Example Program: Finding average of numbers stored in sequential access file - Random access file - Example Program: Transaction processing using random access files — Command line arguments

OUTCOMES:
Upon completion of the course, the students will be able to
- Develop simple applications in C using basic constructs
- Design and implement applications using arrays and strings
- Develop and implement applications in C using functions and pointers.
- Develop applications in C using structures.
- Design applications using sequential and random access file processing.

TEXT BOOKS:
1. Reema Thareja, —Programming in C‖, Oxford University Press, Second Edition, 2016.
2. Kernighan, B.W and Ritchie,D.M, —The C Programming language‖, Second Edition,Pearson Education, 2006

REFERENCES:
1. Paul Deitel and Harvey Deitel, —C How to Program‖, Seventh edition, Pearson Publication
2. Juneja, B. L and Anita Seth, —Programming in C‖, CENGAGE Learning India pvt. Ltd., 2011
3. Pradip Dey, Manas Ghosh, —Fundamentals of Computing and Programming in C‖, FirstEdition, Oxford University Press, 2009.
4. Anita Goel and Ajay Mittal, —Computer Fundamentals and Programming in C‖, DorlingKindersley (India) Pvt. Ltd., Pearson Education in South Asia, 2011.
5. Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming withC",McGraw-Hill Education, 1996.

Dr.R.GURU......................
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CS8351	DIGITAL PRINCIPLES AND SYSTEM DESIGN	L	T	P	C
		4	0	0	4

OBJECTIVES:

- To design digital circuits using simplified Boolean functions
- To analyze and design combinational circuits
- To analyze and design synchronous and asynchronous sequential circuits
- To understand Programmable Logic Devices
- To write HDL code for combinational and sequential circuits

UNIT I   BOOLEAN ALGEBRA AND LOGIC GATES   12

Number Systems - Arithmetic Operations - Binary Codes- Boolean Algebra and Logic Gates - Theorems and Properties of Boolean Algebra - Boolean Functions - Canonical and Standard Forms - Simplification of Boolean Functions using Karnaugh Map - Logic Gates – NAND and NOR Implementations.

UNIT II   COMBINATIONAL LOGIC   12

Combinational Circuits – Analysis and Design Procedures - Binary Adder-Subtractor - Decimal Adder - Binary Multiplier - Magnitude Comparator - Decoders – Encoders –Multiplexers - Introduction to HDL – HDL Models of Combinational circuits.

UNIT III   SYNCHRONOUS SEQUENTIAL LOGIC   12

Sequential Circuits - Storage Elements: Latches , Flip-Flops - Analysis of Clocked Sequential Circuits - State Reduction and Assignment - Design Procedure - Registers and Counters - HDL Models of Sequential Circuits.

UNIT IV   ASYNCHRONOUS SEQUENTIAL LOGIC   12

Analysis and Design of Asynchronous Sequential Circuits – Reduction of State and FlowTables – Race-free State Assignment – Hazards.

UNIT V   MEMORY AND PROGRAMMABLE LOGIC   12

RAM – Memory Decoding – Error Detection and Correction - ROM - Programmable Logic Array – Programmable Array Logic – Sequential Programmable Devices.

                                                       TOTAL :   60   PERIODS

OUTCOMES:

On Completion of the course, the students should be able to:

- Simplify Boolean functions using KMap
- Design and Analyze Combinational and Sequential Circuits
- Implement designs using Programmable Logic Devices
- Write HDL code for combinational and Sequential Circuits

TEXT BOOK:

1.   M. Morris R. Mano, Michael D. Ciletti, —Digital Design: With an Introduction to theVerilog HDL, VHDL, and SystemVerilog‖, 6th Edition, Pearson Education, 2017.

REFERENCES:

1.   G. K. Kharate, Digital Electronics, Oxford University Press, 2010

2.   John F. Wakerly, Digital Design Principles and Practices, Fifth Edition, PearsonEducation, 2017.

3.   Charles H. Roth Jr, Larry L. Kinney, Fundamentals of Logic Design, Sixth Edition,CENGAGE Learning, 2013

4.   Donald D. Givone, Digital Principles and Design‖, Tata Mc Graw Hill, 2003.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CS8391   **DATA STRUCTURES**   L T P C
                                                                                 3 0 0 3

OBJECTIVES:
- To understand the concepts of ADTs
- To Learn linear data structures – lists, stacks, and queues
- To understand sorting, searching and hashing algorithms
- To apply Tree and Graph structures

UNIT I   LINEAR DATA STRUCTURES – LIST   9
Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation
—singly linked lists- circularly linked lists- doubly-linked lists – applications of lists –Polynomial Manipulation – All operations (Insertion, Deletion, Merge, Traversal).

UNIT II   LINEAR DATA STRUCTURES – STACKS, QUEUES   9
Stack ADT – Operations - Applications - Evaluating arithmetic expressions- Conversion of Infix topostfix expression - Queue ADT – Operations - Circular Queue – Priority Queue - deQueue – applications of queues.

UNIT III   NON LINEAR DATA STRUCTURES – TREES   9
Tree ADT – tree traversals - Binary Tree ADT – expression trees – applications of trees – binary search tree ADT – Threaded Binary Trees- AVL Trees – B-Tree - B+ Tree - Heap – Applications ofheap.

UNIT IV   NON LINEAR DATA STRUCTURES - GRAPHS   9
Definition – Representation of Graph – Types of graph - Breadth-first traversal - Depth-first traversal – Topological Sort – Bi-connectivity – Cut vertex – Euler circuits – Applications of graphs.

UNIT V   SEARCHING, SORTING AND HASHING TECHNIQUES   9
Searching- Linear Search - Binary Search. Sorting - Bubble sort - Selection sort - Insertion sort - Shell sort – Radix sort. Hashing- Hash Functions – Separate Chaining – Open Addressing – Rehashing —Extendible Hashing.

                                                              TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Implement abstract data types for linear data structures.
- Apply the different linear and non-linear data structures to problem solutions.
- Critically analyze the various sorting algorithms.

TEXT BOOKS:
1. Mark Allen Weiss, —Data Structures and Algorithm Analysis in C‖, 2nd Edition, PearsonEducation,1997.
2. Reema Thareja, —Data Structures Using C‖, Second Edition , Oxford University Press, 2011.

REFERENCES:
1. Thomas H. Cormen, Charles E. Leiserson, Ronald L.Rivest, Clifford Stein, —Introduction toAlgorithms", Second Edition, Mcgraw Hill, 2002.
2. Aho, Hopcroft and Ullman, —Data Structures and Algorithms‖, Pearson Education,1983.
3. Stephen G. Kochan, —Programming in C‖, 3rd edition, Pearson Education.
4. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, —Fundamentals of Data Structures in C‖,Second Edition, University Press, 2008.

OBJECTIVES:

- To understand Object Oriented Programming concepts and basic characteristics of Java
- To know the principles of packages, inheritance and interfaces
- To define exceptions and use I/O streams
- To develop a java application with threads and generics classes
- To design and build simple Graphical User Interfaces

UNIT I   INTRODUCTION TO OOP AND JAVA FUNDAMENTALS   10

Object Oriented Programming - Abstraction – objects and classes - Encapsulation- Inheritance -Polymorphism- OOP in Java – Characteristics of Java – The Java Environment - Java Source File -Structure – Compilation. Fundamental Programming Structures in Java – Defining classes in Java – constructors, methods -access specifiers - static members -Comments, Data Types, Variables, Operators, Control Flow, Arrays , Packages - JavaDoc comments.

UNIT II   INHERITANCE AND INTERFACES   9

Inheritance – Super classes- sub classes –Protected members – constructors in sub classes- the Object class – abstract classes and methods- final methods and classes – Interfaces – defining an interface, implementing interface, differences between classes and interfaces and extending interfaces - Object cloning -inner classes, Array Lists - Strings

UNIT III   EXCEPTION HANDLING AND I/O   9

Exceptions - exception hierarchy - throwing and catching exceptions – built-in exceptions, creating own exceptions, Stack Trace Elements. Input / Output Basics – Streams – Byte streams and Character streams – Reading and Writing Console – Reading and Writing Files

UNIT IV   MULTITHREADING AND GENERIC PROGRAMMING   8

Differences between multi-threading and multitasking, thread life cycle, creating threads, synchronizing threads, Inter-thread communication, daemon threads, thread groups. Generic Programming — Generic classes — generic methods — Bounded Types — Restrictions and Limitations.

UNIT V   EVENT DRIVEN PROGRAMMING   9

Graphics programming - Frame – Components - working with 2D shapes - Using color, fonts, and images - Basics of event handling - event handlers - adapter classes - actions - mouse events - AWT event hierarchy - Introduction to Swing — layout management - Swing Components — Text

Fields , Text Areas — Buttons- Check Boxes — Radio Buttons — Lists- choices- Scrollbars — Windows –Menus — Dialog Boxes.

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course, students will be able to:

- Develop Java programs using OOP principles
- Develop Java programs with the concepts inheritance and interfaces
- Build Java applications using exceptions and I/O streams
- Develop Java applications with threads and generics classes
- Develop interactive Java programs using swings

TEXT BOOKS:

1. Herbert Schildt, ―Java The complete reference‖, 8th Edition, McGraw Hill Education, 2011.
2. Cay S. Horstmann, Gary cornell, ―Core Java Volume –I Fundamentals‖, 9th Edition,Prentice Hall, 2013.

REFERENCES:

1. Paul Deitel, Harvey Deitel, ―Java SE 8 for programmers‖, 3rd Edition, Pearson, 2015.
2. Steven Holzner, ―Java 2 Black book‖, Dreamtech press, 2011.
3. Timothy Budd, ―Understanding Object-oriented programming with Java‖, Updated Edition,Pearson Education, 2000.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CS8491	COMPUTER ARCHITECTURE	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To learn the basic structure and operations of a computer.
- To learn the arithmetic and logic unit and implementation of fixed-point and floating pointarithmetic unit.
- To learn the basics of pipelined execution.
- To understand parallelism and multi-core processors.
- To understand the memory hierarchies, cache memories and virtual memories.
- To learn the different ways of communication with I/O devices.

UNIT I   BASIC STRUCTURE OF A COMPUTER SYSTEM   9

Functional Units – Basic Operational Concepts – Performance – Instructions: Language ofthe Computer – Operations, Operands – Instruction representation – Logical operations – decision making – MIPS Addressing.

UNIT II   ARITHMETIC FOR COMPUTERS   9

Addition and Subtraction – Multiplication – Division – Floating Point Representation –Floating Point Operations – Subword Parallelism

UNIT III   PROCESSOR AND CONTROL UNIT   9

A Basic MIPS implementation – Building a Datapath – Control Implementation Scheme – Pipelining – Pipelined datapath and control – Handling Data Hazards & Control Hazards –Exceptions.

UNIT IV   PARALLELISIM   9

Parallel processing challenges – Flynn's classification – SISD, MIMD, SIMD, SPMD, and Vector Architectures - Hardware multithreading – Multi-core processors and other Shared Memory Multiprocessors - Introduction to Graphics Processing Units, Clusters, Warehouse Scale Computers and other Message-Passing Multiprocessors.

UNIT V   MEMORY & I/O SYSTEMS   9

Memory Hierarchy - memory technologies – cache memory – measuring and improving cache performance – virtual memory, TLB's – Accessing I/O Devices – Interrupts – Direct Memory Access – Bus structure – Bus operation – Arbitration – Interface circuits - USB.

TOTAL :   45   PERIODS

OUTCOMES:
On Completion of the course, the students should be able to:

- Understand the basics structure of computers, operations and instructions.
- Design arithmetic and logic unit.
- Understand pipelined execution and design control unit.
- Understand parallel processing architectures.
- Understand the various memory systems and I/O communication.

TEXT BOOKS:

1.   David A. Patterson and John L. Hennessy, Computer Organization and Design: TheHardware/Software Interface, Fifth Edition, Morgan Kaufmann / Elsevier, 2014.
2.   Carl Hamacher, Zvonko Vranesic, Safwat Zaky and Naraig Manjikian, ComputerOrganization and Embedded Systems, Sixth Edition, Tata McGraw Hill, 2012.

REFERENCES:

1.   William Stallings, Computer Organization and Architecture – Designing forPerformance, Eighth Edition, Pearson Education, 2010.
2.   John P. Hayes, Computer Architecture and Organization, Third Edition, TataMcGraw Hill, 2012.

3.   John L. Hennessey and David A. Patterson, Computer Architecture – A Quantitative Approach‖, Morgan Kaufmann / Elsevier Publishers, Fifth Edition, 2012.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

<div align="right">

C3 0

0 3

</div>

OBJECTIVES

- To learn the fundamentals of data models and to represent a database system using ERdiagrams.
- To study SQL and relational database design.
- To understand the internal storage structures using different file and indexingtechniques which will help in physical DB design.
- To understand the fundamental concepts of transaction processing- concurrencycontrol techniques and recovery procedures.
- To have an introductory knowledge about the Storage and Query processingTechniques

UNIT I   RELATIONAL DATABASES   10

Purpose of Database System – Views of data – Data Models – Database System Architecture – Introduction to relational databases — Relational Model — Keys — Relational Algebra — SQL fundamentals – Advanced SQL features – Embedded SQL– Dynamic SQL

UNIT II   DATABASE DESIGN   8

Entity-Relationship model – E-R Diagrams – Enhanced-ER Model – ER-to-Relational Mapping – Functional Dependencies – Non-loss Decomposition – First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form – Multi-valued Dependencies and FourthNormal Form – Join Dependencies and Fifth Normal Form

UNIT III   TRANSACTIONS   9

Transaction Concepts – ACID Properties – Schedules – Serializability – Concurrency Control – Need for Concurrency – Locking Protocols – Two Phase Locking – Deadlock – Transaction Recovery - Save Points – Isolation Levels – SQL Facilities for Concurrency and Recovery.

UNIT IV   IMPLEMENTATION TECHNIQUES   9

RAID – File Organization – Organization of Records in Files – Indexing and Hashing –Ordered Indices – B+ tree Index Files – B tree Index Files – Static Hashing – Dynamic Hashing – QueryProcessing Overview – Algorithms for SELECT and JOIN operations – Query optimization usingHeuristics and Cost Estimation.

UNIT V   ADVANCED TOPICS   9

Distributed Databases: Architecture, Data Storage, Transaction Processing — Object-based Databases: Object Database Concepts, Object-Relational features, ODMG Object Model, ODL, OQL - XML Databases: XML Hierarchical Model, DTD, XML Schema, XQuery — Information Retrieval: IR Concepts, Retrieval Models, Queries in IR systems.

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course, the students will be able to:

- Classify the modern and futuristic database applications based on size and complexity
- Map ER model to Relational model to perform database design effectively
- Write queries using normalization criteria and optimize queries
- Compare and contrast various indexing strategies in different database systems
- Appraise how advanced databases differ from traditional databases.

TEXT BOOKS:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, ―Database System Concepts‖, SixthEdition, Tata McGraw Hill, 2011.
2. Ramez Elmasri, Shamkant B. Navathe, ―Fundamentals of Database Systems‖, Sixth Edition,Pearson Education, 2011.

REFERENCES:

1. C.J.Date, A.Kannan, S.Swamynathan, ―An Introduction to Database Systems‖, Eighth Edition,Pearson Education, 2006.
2. Raghu Ramakrishnan, ―Database Management Systems‖, Fourth Edition, McGraw-HillCollege Publications, 2015.
3. G.K.Gupta,"Database Management Systems‖, Tata McGraw Hill, 2011.

CS8451   **DESIGN AND ANALYSIS OF ALGORITHMS**   **L T P C**

                                                                                                      3 0 0 3

OBJECTIVES:
- To understand and apply the algorithm analysis techniques.
- To critically analyze the efficiency of alternative algorithmic solutions for the same problem
- To understand different algorithm design techniques.
- To understand the limitations of Algorithmic power.

UNIT I   INTRODUCTION   9
Notion of an Algorithm – Fundamentals of Algorithmic Problem Solving – Important Problem Types
— Fundamentals of the Analysis of Algorithmic Efficiency –Asymptotic Notations and their properties. Analysis
Framework — Empirical analysis - Mathematical analysis for Recursive andNon-recursive algorithms - Visualization

UNIT II   BRUTE FORCE AND DIVIDE-AND-CONQUER   9
Brute Force — Computing a^n — String Matching - Closest-Pair and Convex-Hull Problems - Exhaustive Search - Travelling
Salesman Problem - Knapsack Problem - Assignment problem.
Divide and Conquer Methodology — Binary Search — Merge sort — Quick sort — Heap Sort -Multiplication of Large
Integers – Closest-Pair and Convex - Hull Problems.

UNIT III   DYNAMIC PROGRAMMING AND GREEDY TECHNIQUE   9
Dynamic programming – Principle of optimality - Coin changing problem, Computing a Binomial Coefficient – Floyd's
algorithm – Multi stage graph - Optimal Binary Search Trees – Knapsack Problem and Memory functions. Greedy
Technique — Container loading problem - Prim's algorithm and Kruskal's Algorithm – 0/1 Knapsack problem, Optimal
Merge pattern - Huffman Trees.

UNIT IV   ITERATIVE IMPROVEMENT   9
The Simplex Method - The Maximum-Flow Problem — Maximum Matching in Bipartite Graphs, Stable marriage Problem.

UNIT V   COPING WITH THE LIMITATIONS OF ALGORITHM POWER   9
Lower - Bound Arguments - P, NP NP- Complete and NP Hard Problems. Backtracking – n-Queen problem - Hamiltonian
Circuit Problem – Subset Sum Problem. Branch and Bound – LIFO Search and FIFO search - Assignment problem –
Knapsack Problem – Travelling Salesman Problem - Approximation Algorithms for NP-Hard Problems – Travelling
Salesman problem – Knapsack problem.

                                                       TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the students should be able to:
- Design algorithms for various computing problems.
- Analyze the time and space complexity of algorithms.
- Critically analyze the different algorithm design techniques for a given problem.
- Modify existing algorithms to improve efficiency.

TEXT BOOKS:
1. Anany Levitin, ―Introduction to the Design and Analysis of Algorithms‖, Third Edition,Pearson Education, 2012.
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, Computer Algorithms/ C++, SecondEdition, Universities Press, 2007.

REFERENCES:
1. Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, ―Introductionto Algorithms‖, Third Edition, PHI Learning Private Limited, 2012.
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, ―Data Structures and Algorithms‖,Pearson Education, Reprint 2006.
3. Harsh Bhasin, ―Algorithms Design and Analysis‖, Oxford university press, 2016.
4. S. Sridhar, ―Design and Analysis of Algorithms‖, Oxford university press, 2014.
5. http://nptel.ac.in/

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CS8493	OPERATING SYSTEMS	L T P C
		3 0 0 3

OBJECTIVES:

- To understand the basic concepts and functions of operating systems.
- To understand Processes and Threads
- To analyze Scheduling algorithms.
- To understand the concept of Deadlocks.
- To analyze various memory management schemes.
- To understand I/O management and File systems.
- To be familiar with the basics of Linux system and Mobile OS like iOS and Android.

UNIT I   OPERATING SYSTEM OVERVIEW   7

Computer System Overview-Basic Elements, Instruction Execution, Interrupts, Memory Hierarchy, Cache Memory, Direct Memory Access, Multiprocessor and Multicore Organization. Operating system overview-objectives and functions, Evolution of Operating System.- Computer System Organization Operating System Structure and Operations- System Calls, System Programs, OS Generation and System Boot.

UNIT II   PROCESS MANAGEMENT   11

Processes - Process Concept, Process Scheduling, Operations on Processes, Inter-process Communication; CPU Scheduling - Scheduling criteria, Scheduling algorithms, Multiple-processor scheduling, Real time scheduling; Threads- Overview, Multithreading models, Threading issues; Process Synchronization - The critical-section problem, Synchronization hardware, Mutex locks, Semaphores, Classic problems of synchronization, Critical regions, Monitors; Deadlock - System model, Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock.

UNIT III   STORAGE MANAGEMENT   9

Main Memory – Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation, Segmentation with paging, 32 and 64 bit architecture Examples; Virtual Memory — Background, Demand Paging, Page Replacement, Allocation, Thrashing; Allocating Kernel Memory, OS Examples.

UNIT IV   FILE SYSTEMS AND I/O SYSTEMS   9

Mass Storage system — Overview of Mass Storage Structure, Disk Structure, Disk Scheduling and Management, swap space management; File-System Interface - File concept, Access methods, Directory Structure, Directory organization, File system mounting, File Sharing and Protection; File System Implementation- File System Structure, Directory implementation, Allocation Methods, Free Space Management, Efficiency and Performance, Recovery; I/O Systems — I/O Hardware, Application I/O interface, Kernel I/O subsystem, Streams, Performance.

UNIT V   CASE STUDY   9

Linux System - Design Principles, Kernel Modules, Process Management, Scheduling, Memory Management, Input-Output Management, File System, Inter-process Communication; Mobile OS - iOS and Android - Architecture and SDK Framework, Media Layer, Services Layer, Core OSLayer, File System.

TOTAL : 45 PERIODS

OUTCOMES:
At the end of the course, the students should be able to:

- Analyze various scheduling algorithms.
- Understand deadlock, prevention and avoidance algorithms.
- Compare and contrast various memory management schemes.
- Understand the functionality of file systems.
- Perform administrative tasks on Linux Servers.
- Compare iOS and Android Operating Systems.

TEXT BOOK :
1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, —Operating System Concepts‖,9th Edition, John Wiley and Sons Inc., 2012.

REFERENCES :
1. Ramaz Elmasri, A. Gil Carrick, David Levine, —Operating Systems – A Spiral Approach‖,Tata McGraw Hill Edition, 2010.
2. Achyut S.Godbole, Atul Kahate, —Operating Systems‖, McGraw Hill Education, 2016.
3. Andrew S. Tanenbaum, —Modern Operating Systems‖, Second Edition, PearsonEducation, 2004.
4. Gary Nutt, —Operating Systems‖, Third Edition, Pearson Education, 2004.
5. Harvey M. Deitel, —Operating Systems‖, Third Edition, Pearson Education, 2004.
6. Daniel P Bovet and Marco Cesati, —Understanding the Linux kernel‖, 3rd edition, O'Reilly,2005.
7. Neil Smyth, —iPhone iOS 4 Development Essentials – Xcode‖, Fourth Edition, Payload media,2011.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CS8494	SOFTWARE ENGINEERING	L	T	P	C
		3	0	0	3

OBJECTIVES:
- To understand the phases in a software project
- To understand fundamental concepts of requirements engineering and Analysis Modeling.
- To understand the various software design methodologies
- To learn various testing and maintenance measures

UNIT I   SOFTWARE PROCESS AND AGILE DEVELOPMENT   9

Introduction to Software Engineering, Software Process, Perspective and Specialized Process Models –Introduction to Agility-Agile process-Extreme programming-XP Process.

UNIT II   REQUIREMENTS ANALYSIS AND SPECIFICATION   9

Software Requirements: Functional and Non-Functional, User requirements, System requirements, Software Requirements Document — Requirement Engineering Process: Feasibility Studies, Requirements elicitation and analysis, requirements validation, requirements management- Classical analysis: Structured system Analysis, Petri Nets- Data Dictionary.

UNIT III   SOFTWARE DESIGN   9

Design process — Design Concepts-Design Model– Design Heuristic — Architectural Design - Architectural styles, Architectural Design, Architectural Mapping using Data Flow- User Interface Design: Interface analysis, Interface Design – Component level Design: Designing Class basedcomponents, traditional Components.

UNIT IV   TESTING AND MAINTENANCE   9

Software testing fundamentals-Internal and external views of Testing-white box testing - basispath testing-control structure testing-black box testing- Regression Testing — Unit Testing — Integration Testing — Validation Testing — System Testing And Debugging –Software Implementation Techniques: Coding practices-Refactoring-Maintenance and Reengineering-BPR model-Reengineering process model-Reverse and Forward Engineering.

**   9**

UNIT V   PROJECT MANAGEMENT

Software Project Management: Estimation – LOC, FP Based Estimation, Make/Buy Decision COCOMO I & II Model – Project Scheduling – Scheduling, Earned Value Analysis Planning – Project Plan, Planning Process, RFP Risk Management – Identification, Projection - Risk Management-Risk Identification-RMMM Plan-CASE TOOLS

TOTAL :45 PERIODS

OUTCOMES:
On Completion of the course, the students should be able to:
- Identify the key activities in managing a software project.
- Compare different process models.
- Concepts of requirements engineering and Analysis Modeling.
- Apply systematic procedure for software design and deployment.
- Compare and contrast the various testing and maintenance.
- Manage project schedule, estimate project cost and effort required.

TEXT BOOKS:
1. Roger S. Pressman, ―Software Engineering – A Practitioner‟s Approach‖, Seventh Edition, McGraw-Hill International Edition, 2010.
2. Ian Sommerville, ―Software Engineering‖, 9th Edition, Pearson Education Asia, 2011.

REFERENCES:

1. Rajib Mall, ―Fundamentals of Software Engineering‖, Third Edition, PHI LearningPrivateLimited, 2009.

2. Pankaj Jalote, ―Software Engineering, A Precise Approach‖, Wiley India, 2010.
3. Kelkar S.A., ―Software Engineering‖, Prentice Hall of India Pvt Ltd, 2007.
4. Stephen R.Schach, ―Software Engineering‖, Tata McGraw-Hill Publishing CompanyLimited,2007.
5. http://nptel.ac.in/.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CS8591	COMPUTER NETWORKS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the protocol layering and physical level communication.
- To analyze the performance of a network.
- To understand the various components required to build different networks.
- To learn the functions of network layer and the various routing protocols.
- To familiarize the functions and protocols of the Transport layer.

UNIT I   INTRODUCTION AND PHYSICAL LAYER   9

Networks – Network Types – Protocol Layering – TCP/IP Protocol suite – OSI Model – Physical Layer: Performance – Transmission media – Switching – Circuit-switched Networks – Packet Switching.

UNIT II   DATA-LINK LAYER & MEDIA ACCESS   9

Introduction – Link-Layer Addressing – DLC Services – Data-Link Layer Protocols – HDLC – PPP - Media Access Control - Wired LANs: Ethernet - Wireless LANs – Introduction –IEEE 802.11, Bluetooth – Connecting Devices.

UNIT III   NETWORK LAYER   9

Network Layer Services – Packet switching – Performance – IPV4 Addresses – Forwarding of IP Packets - Network Layer Protocols: IP, ICMP v4 – Unicast Routing Algorithms – Protocols – Multicasting Basics – IPV6 Addressing – IPV6 Protocol.

UNIT IV   TRANSPORT LAYER   9

Introduction – Transport Layer Protocols – Services – Port Numbers – User Datagram Protocol – Transmission Control Protocol – SCTP.

UNIT V   APPLICATION LAYER   9

WWW and HTTP – FTP – Email –Telnet –SSH – DNS – SNMP.

                                                             TOTAL :   45   PERIODS

OUTCOMES:

On Completion of the course, the students should be able to:

- Understand the basic layers and its functions in computer networks.
- Evaluate the performance of a network.
- Understand the basics of how data flows from one node to another.
- Analyze and design routing algorithms.
- Design protocols for various functions in the network.
- Understand the working of various application layer protocols.

TEXT BOOK:

1.   Behrouz A. Forouzan, Data Communications and Networking, Fifth Edition TMH,2013.

REFERENCES

1.   Larry L. Peterson, Bruce S. Davie, Computer Networks: A Systems Approach, FifthEdition, Morgan Kaufmann Publishers Inc., 2012.

2.   William Stallings, Data and Computer Communications, Tenth Edition, PearsonEducation, 2013.

3.   Nader F. Mir, Computer and Communication Networks, Second Edition, Prentice Hall, 2014.

4.   Ying-Dar Lin, Ren-Hung Hwang and Fred Baker, Computer Networks: An OpenSource Approach, McGraw Hill Publisher, 2011.

5.   James F. Kurose, Keith W. Ross, Computer Networking, A Top-Down ApproachFeaturing the Internet, Sixth Edition, Pearson Education, 2013.

REFERENCES:

1. Doughlas V.Hall, —Microprocessors and Interfacing, Programming and Hardware‖,TMH,2012

2. A.K.Ray,K.M.Bhurchandi,‖Advanced Microprocessors and Peripherals —3rd edition, TataMcGrawHill,2012

CS8501   **THEORY OF COMPUTATION**   **L T P C3**
                                                                                                        0 0 3

OBJECTIVES:

- To understand the language hierarchy
- To construct automata for any given pattern and find its equivalent regularexpressions
- To design a context free grammar for any given language
- To understand Turing machines and their capability
- To understand undecidable problems and NP class problems

UNIT I   AUTOMATA FUNDAMENTALS   9
Introduction to formal proof – Additional forms of Proof – Inductive Proofs –Finite Automata – Deterministic Finite
Automata – Non-deterministic Finite Automata – Finite Automata with EpsilonTransitions

UNIT II   REGULAR EXPRESSIONS AND LANGUAGES   9
Regular Expressions – FA and Regular Expressions – Proving Languages not to be regular – Closure Properties of Regular
Languages – Equivalence and Minimization of Automata.

UNIT III   CONTEXT FREE GRAMMAR AND LANGUAGES   9
CFG – Parse Trees – Ambiguity in Grammars and Languages – Definition of the Pushdown Automata – Languages of a
Pushdown Automata – Equivalence of Pushdown Automata and CFG, Deterministic Pushdown Automata.

UNIT IV   PROPERTIES OF CONTEXT FREE LANGUAGES   9
Normal Forms for CFG – Pumping Lemma for CFL – Closure Properties of CFL – Turing Machines – Programming Techniques
for TM.

UNIT V   UNDECIDABILITY   9
Non Recursive Enumerable (RE) Language – Undecidable Problem with RE – Undecidable Problems about TM – Post's
Correspondence Problem, The Class P and NP.

                                                                                        TOTAL :45PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to:

- Construct automata, regular expression for any pattern.
- Write Context free grammar for any construct.
- Design Turing machines for any language.
- Propose computation solutions using Turing machines.
- Derive whether a problem is decidable or not.

TEXT BOOK:

1. J.E.Hopcroft, R.Motwani and J.D Ullman, ―Introduction to Automata Theory, Languages andComputations‖, Second Edition,
   Pearson Education, 2003.

REFERENCES:

1. H.R.Lewis and C.H.Papadimitriou, ―Elements of the theory of Computation‖, Second Edition,PHI, 2003.

2. J.Martin, ―Introduction to Languages and the Theory of Computation‖, Third Edition, TMH, 2003.

3. Micheal Sipser, ―Introduction of the Theory and Computation‖, Thomson Brokecole, 1997.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CS8592   **OBJECT ORIENTED ANALYSIS AND DESIGN**   L T P C
                                                                                     3 0 0 3

OBJECTIVES:

- To understand the fundamentals of object modeling
- To understand and differentiate Unified Process from other approaches.
- To design with static UML diagrams.
- To design with the UML dynamic and implementation diagrams.
- To improve the software design with design patterns.
- To test the software against its requirements specification

UNIT I   UNIFIED PROCESS AND USE CASE DIAGRAMS   9
Introduction to OOAD with OO Basics - Unified Process – UML diagrams – Use Case –Case study
– the Next Gen POS system, Inception -Use case Modelling – Relating Use cases –include, extend and
generalization – When to use Use-cases

UNIT II   STATIC UML DIAGRAMS   9
Class Diagram— Elaboration – Domain Model – Finding conceptual classes and description classes – Associations –
Attributes – Domain model refinement – Finding conceptual class Hierarchies – Aggregation and Composition -
Relationship between sequence diagrams and use cases — When to use Class Diagrams

UNIT III   DYNAMIC AND IMPLEMENTATION UML DIAGRAMS   9
Dynamic Diagrams – UML interaction diagrams - System sequence diagram – Collaboration diagram – When to use
Communication Diagrams - State machine diagram and Modelling –When to use State Diagrams - Activity diagram – When to
use activity diagrams

Implementation Diagrams - UML package diagram - When to use package diagrams - Component and Deployment
Diagrams – When to use Component and Deployment diagrams

UNIT IV   DESIGN PATTERNS   9
GRASP: Designing objects with responsibilities – Creator – Information expert – Low Coupling –High Cohesion —
Controller

Design Patterns – creational – factory method – **structural** – Bridge – Adapter – **behavioural** –Strategy – observer –
Applying GoF design patterns – Mapping design to code

UNIT V   TESTING   9
Object Oriented Methodologies – Software Quality Assurance – Impact of object orientation on Testing – Develop Test
Cases and Test Plans

                                                                  TOTAL: 45 PERIODS

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

- Express software design with UML diagrams
- Design software applications using OO concepts.
- Identify various scenarios based on software requirements
- Transform UML based software design into pattern based design using design patterns
- Understand the various testing methodologies for OO software

TEXT BOOKS:

1. Craig Larman, —Applying UML and Patterns: An Introduction to Object-Oriented Analysis andDesign and Iterative
   Development‖, Third Edition, Pearson Education, 2005.
2. Ali Bahrami - Object Oriented Systems Development - McGraw Hill International Edition - 1999

REFERENCES:

1. Erich Gamma, a n d Richard Helm, Ralph Johnson, John Vlissides, —Design patterns: Elementsof Reusable Object-Oriented
   Software‖, Addison-Wesley, 1995.
2. Martin Fowler, —UML Distilled: A Brief Guide to the Standard Object Modeling Language‖,Third edition, Addison Wesley, 2003

CS8601	MOBILE COMPUTING	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the basic concepts of mobile computing.
- To learn the basics of mobile telecommunication system .
- To be familiar with the network layer protocols and Ad-Hoc networks.
- To know the basis of transport and application layer protocols.
- To gain knowledge about different mobile platforms and application development.

UNIT I   INTRODUCTION   9

Introduction to Mobile Computing – Applications of Mobile Computing- Generations of Mobile Communication Technologies- Multiplexing – Spread spectrum -MAC Protocols – SDMA- TDMA- FDMA- CDMA

UNIT II   MOBILE TELECOMMUNICATION SYSTEM   9

Introduction to Cellular Systems - GSM – Services & Architecture – Protocols – ConnectionEstablishment – Frequency Allocation – Routing – Mobility Management – Security – GPRS-UMTS – Architecture – Handover - Security

UNIT III   MOBILE NETWORK LAYER   9

Mobile IP – DHCP – AdHoc– Proactive protocol-DSDV, Reactive Routing Protocols – DSR,AODV , Hybrid routing –ZRP, Multicast Routing- ODMRP, Vehicular Ad Hoc networks(VANET) –MANET Vs VANET – Security.

UNIT IV   MOBILE TRANSPORT AND APPLICATION LAYER   9

Mobile TCP– WAP – Architecture – WDP – WTLS – WTP –WSP – WAE – WTA Architecture– WML

UNIT V   MOBILE PLATFORMS AND APPLICATIONS   9

Mobile Device Operating Systems – Special Constraints & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry, Windows Phone — MCommerce — Structure — Pros & Cons — Mobile Payment System — Security
Issues

TOTAL   45   PERIODS

OUTCOMES:

At the end of the course, the students should be able to:

- Explain the basics of mobile telecommunication systems
- Illustrate the generations of telecommunication systems in wireless networks
- Determine the functionality of MAC, network layer and Identify a routing protocol for agiven Ad hoc network
- Explain the functionality of Transport and Application layers
- Develop a mobile application using android/blackberry/ios/Windows SDK

TEXT BOOKS:

1. Jochen Schiller, ―Mobile Communications‖, PHI, Second Edition, 2003.
2. Prasant Kumar Pattnaik, Rajib Mall, ―Fundamentals of Mobile Computing‖, PHILearning Pvt.Ltd, New Delhi — 2012

REFERENCES

1. Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobilesystems",Thomson Asia Pvt Ltd, 2005.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, ―Principles of Mobile Computing‖, Springer, 2003.
3. William.C.Y.Lee,―Mobile Cellular Telecommunications-Analog and Digital Systems‖,Second Edition,TataMcGraw Hill Edition ,2006.
4. C.K.Toh, ―AdHoc Mobile Wireless Networks‖, First Edition, Pearson Education, 2002.
5. Android Developers : http://developer.android.com/index.html
6. Apple Developer : https://developer.apple.com/
7. Windows Phone DevCenter : http://developer.windowsphone.com
8. BlackBerry Developer : http://developer.blackberry.com

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CS8602	COMPILER DESIGN	L	T	P	C
		3	0	2	4

OBJECTIVES:

- To learn the various phases of compiler.
- To learn the various parsing techniques.
- To understand intermediate code generation and run-time environment.
- To learn to implement front-end of the compiler.
- To learn to implement code generator.

UNIT I   INTRODUCTION TO COMPILERS   9

Structure of a compiler — Lexical Analysis — Role of Lexical Analyzer — Input Buffering — Specification of Tokens — Recognition of Tokens — Lex — Finite Automata — Regular Expressionsto Automata — Minimizing DFA.

UNIT II   SYNTAX ANALYSIS   12

Role of Parser – Grammars – Error Handling – Context-free grammars – Writing a grammar –Top Down Parsing - General Strategies Recursive Descent Parser Predictive Parser-LL(1) Parser-Shift Reduce Parser-LR Parser-LR (0)Item Construction of SLR Parsing Table - Introduction to LALR Parser - Error Handling and Recovery in Syntax Analyzer-YACC.

UNIT III   INTERMEDIATE CODE GENERATION   8

Syntax Directed Definitions, Evaluation Orders for Syntax Directed Definitions, Intermediate Languages: Syntax Tree, Three Address Code, Types and Declarations, Translation of Expressions, Type Checking.

UNIT IV   RUN-TIME ENVIRONMENT AND CODE GENERATION   8

Storage Organization, Stack Allocation Space, Access to Non-local Data on the Stack, HeapManagement - Issues in Code Generation - Design of a simple Code Generator.

UNIT V   CODE OPTIMIZATION   8

Principal Sources of Optimization – Peep-hole optimization - DAG- Optimization of Basic Blocks-Global Data Flow Analysis - Efficient Data Flow Algorithm.

Total: 45 Periods

TEXT BOOK:

1. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Compilers: Principles,Techniques and Tools‖, Second Edition, Pearson Education, 2009.

REFERENCES

1. Randy Allen, Ken Kennedy, Optimizing Compilers for Modern Architectures: ADependence based

    Approach, Morgan Kaufmann Publishers, 2002.

2. Steven S. Muchnick, Advanced Compiler Design and Implementation‖, Morgan KaufmannPublishers - Elsevier Science,

    India, Indian Reprint 2003.

3. Keith D Cooper and Linda Torczon, Engineering a Compiler‖, Morgan KaufmannPublishers Elsevier Science, 2004.

4. V. Raghavan, Principles of Compiler Design‖, Tata McGraw Hill Education Publishers,2010.

5. Allen I. Holub, Compiler Design in C‖, Prentice-Hall Software Series, 1993.

OBJECTIVES:
- To understand the foundations of distributed systems.
- To learn issues related to clock Synchronization and the need for global state in distributedsystems.
- To learn distributed mutual exclusion and deadlock detection algorithms.
- To understand the significance of agreement, fault tolerance and recovery protocols inDistributed Systems.
- To learn the characteristics of peer-to-peer and distributed shared memory systems.

UNIT I   INTRODUCTION   9
Introduction: Definition –Relation to computer system components –Motivation –Relation to parallel systems — Message-passing systems versus shared memory systems –Primitives for distributed communication –Synchronous versus asynchronous executions –Design issues and challenges. **A model of distributed computations:** A distributed program –A model of distributed executions –Models of communication networks –Global state — Cuts –Past and future cones of an event –Models of process communications. **Logical Time**: A framework for a system of logical clocks –Scalar time –Vector time — Physical clock synchronization: NTP.

UNIT II   MESSAGE ORDERING & SNAPSHOTS   9
Message ordering and group communication: Message ordering paradigms –Asynchronous execution with synchronous communication –Synchronous program order on an asynchronous system –Group communication — Causal order (CO) - Total order. **Global state and snapshot recording algorithms:** Introduction –System model and definitions –Snapshot algorithms for FIFO channels

UNIT III   DISTRIBUTED MUTEX & DEADLOCK   9
Distributed mutual exclusion algorithms: Introduction – Preliminaries – Lamport's algorithm – Ricart-Agrawala algorithm – Maekawa's algorithm – Suzuki–Kasami's broadcast algorithm. **Deadlock detection in distributed systems:** Introduction – System model – Preliminaries – Models of deadlocks – Knapp's classification – Algorithms for the single resource model, the AND model and the OR model.

UNIT IV   RECOVERY & CONSENSUS   9
Checkpointing and rollback recovery: Introduction – Background and definitions – Issues in failure recovery – Checkpoint-based recovery – Log-based rollback recovery – Coordinated checkpointing algorithm – Algorithm for asynchronous checkpointing and recovery. **Consensus and agreement algorithms:** Problem definition – Overview of results – Agreement in a failure –free system –Agreement in synchronous systems with failures.

UNIT V   P2P & DISTRIBUTED SHARED MEMORY   9
Peer-to-peer computing and overlay graphs: Introduction – Data indexing and overlays – Chord
— Content addressable networks – Tapestry. **Distributed shared memory:** Abstraction and advantages – Memory consistency models –Shared memory Mutual Exclusion.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of this course, the students will be able to:
- Elucidate the foundations and issues of distributed systems
- Understand the various synchronization issues and global state for distributed systems.
- Understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems
- Describe the agreement protocols and fault tolerance mechanisms in distributed systems.
- Describe the features of peer-to-peer and distributed shared memory systems

TEXT BOOKS:
1. Kshemkalyani, Ajay D., and Mukesh Singhal. Distributed computing: principles, algorithms,and systems. Cambridge University Press, 2011.
2. George Coulouris, Jean Dollimore and Tim Kindberg, —Distributed Systems Concepts andDesign‖, Fifth Edition, Pearson Education, 2012.

REFERENCES:
1. Pradeep K Sinha, "Distributed Operating Systems: Concepts and Design", Prentice Hall ofIndia, 2007.
2. Mukesh Singhal and Niranjan G. Shivaratri. Advanced concepts in operating systems.McGraw-Hill, Inc., 1994.
3. Tanenbaum A.S., Van Steen M., —Distributed Systems: Principles and Paradigms‖,Pearson Education, 2007.
4. Liu M.L., —Distributed Computing, Principles and Applications‖, Pearson Education, 2004.
5. Nancy A Lynch, —Distributed Algorithms‖, Morgan Kaufman Publishers, USA, 2003.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

AD HOC AND SENSOR NETWORKS   L T P C
                                                                                      3 0 0 3

OBJECTIVES:

The student should be made to:

- Understand the design issues in ad hoc and sensor networks.
- Learn the different types of MAC protocols.
- Be familiar with different types of adhoc routing protocols.
- Be expose to the TCP issues in adhoc networks.
- Learn the architecture and protocols of wireless sensor networks.

UNIT I   INTRODUCTION   9

Fundamentals of Wireless Communication Technology — The Electromagnetic Spectrum — Radio propagation Mechanisms — Characteristics of the Wireless Channel -mobile ad hoc networks (MANETs) and wireless sensor networks (WSNs) :concepts and architectures. Applications of Ad Hoc and Sensor networks. Design Challenges in Ad hoc and Sensor Networks.

UNIT II   MAC PROTOCOLS FOR AD HOC WIRELESS NETWORKS   9

Issues in designing a MAC Protocol- Classification of MAC Protocols- Contention based protocols-Contention based protocols with Reservation Mechanisms- Contention based protocols withScheduling Mechanisms — Multi channel MAC-IEEE 802.11

UNIT III   ROUTING PROTOCOLS AND TRANSPORT LAYER IN AD HOC WIRELESS NETWORKS   9

Issues in designing a routing and Transport Layer protocol for Ad hoc networks- proactive routing, reactive routing (on-demand), hybrid routing- Classification of Transport Layer solutions-TCP over Ad hoc wireless Networks.

UNIT IV   WIRELESS SENSOR NETWORKS (WSNS) AND MAC PROTOCOLS   9

Single node architecture: hardware and software components of a sensor node - WSN Network architecture: typical network architectures-data relaying and aggregation strategies -MAC layer protocols: self-organizing, Hybrid TDMA/FDMA and CSMA based MAC- IEEE 802.15.4.

UNIT V   WSN ROUTING, LOCALIZATION & QOS   9

Issues in WSN routing – OLSR- Localization – Indoor and Sensor Network Localization-absolute andrelative localization, triangulation-QOS in WSN-Energy Efficient Design-Synchronization-Transport Layer issues.

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the student should be able to:

- Explain the concepts, network architectures and applications of ad hoc and wireless sensornetworks
- Analyze the protocol design issues of ad hoc and sensor networks
- Design routing protocols for ad hoc and wireless sensor networks with respect to some protocoldesign issues
- Evaluate the QoS related performance measurements of ad hoc and sensor networks

TEXT BOOK:

1. C. Siva Ram Murthy, and B. S. Manoj, "Ad Hoc Wireless Networks: Architectures and Protocols ",Prentice Hall Professional Technical Reference, 2008.

REFERENCES:

1. Carlos De Morais Cordeiro, Dharma Prakash Agrawal "Ad Hoc & Sensor Networks:Theory and Applications", World Scientific Publishing Company, 2006.
2. Feng Zhao and Leonides Guibas, "Wireless Sensor Networks", Elsevier Publication -2002.
3. Holger Karl and Andreas Willig "Protocols and Architectures for Wireless Sensor Networks",Wiley, 2005
4. Kazem Sohraby, Daniel Minoli, & Taieb Znati, "Wireless Sensor Networks-Technology,Protocols, and Applications", John Wiley, 2007.
5. Anna Hac, "Wireless Sensor Network Designs", John Wiley, 2003.

PRINCIPAL
idhaya Engineering College for W......
Nainarpalaym Road, CHINNASALE.   ...
kallakurichi Taluk, Villupuram District

CS6703   **GRID AND CLOUD COMPUTING**   **L T P C**

                                                                              3 0 0 3

OBJECTIVES:

The student should be made to:

- Understand how Grid computing helps in solving large scale scientific problems.
- Gain knowledge on the concept of virtualization that is fundamental to cloud computing.
- Learn how to program the grid and the cloud.
- Understand the security issues in the grid and the cloud environment.

UNIT I   INTRODUCTION   **9**

Evolution of Distributed computing: Scalable computing over the Internet – Technologies for network based systems – clusters of cooperative computers - Grid computing Infrastructures – cloud computing - service oriented architecture – Introduction to Grid Architecture and standards – Elements of Grid – Overview of Grid Architecture.

UNIT II   GRID SERVICES   **9**

Introduction to Open Grid Services Architecture (OGSA) – Motivation – Functionality Requirements –Practical & Detailed view of OGSA/OGSI – Data intensive grid service models – OGSA services.

UNIT III   VIRTUALIZATION   **9**

Cloud deployment models: public, private, hybrid, community – Categories of cloud computing: Everything as a service: Infrastructure, platform, software - Pros and Cons of cloud computing – Implementation levels of virtualization – virtualization structure – virtualization of CPU, Memory andI/O devices – virtual clusters and Resource Management – Virtualization for data center automation.

UNIT IV   PROGRAMMING MODEL   **9**

Open source grid middleware packages – Globus Toolkit (GT4) Architecture , Configuration – Usageof Globus — Main components and Programming model - Introduction to Hadoop Framework - Mapreduce, Input splitting, map and reduce functions, specifying input and output parameters, configuring and running a job — Design of Hadoop file system, HDFS concepts, command line and java interface, dataflow of File read & File write.

UNIT V   SECURITY   **9**

Trust models for Grid security environment — Authentication and Authorization methods — Grid security infrastructure – Cloud Infrastructure security: network, host and application level – aspects of data security, provider data and its security, Identity and access management architecture, IAM practices in the cloud, SaaS, PaaS, IaaS availability in the cloud, Key privacy issues in the cloud.

                                                        TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Apply grid computing techniques to solve large scale scientific problems.
- Apply the concept of virtualization.
- Use the grid and cloud tool kits.
- Apply the security models in the grid and the cloud environment.

TEXT BOOK:

1. Kai Hwang, Geoffery C. Fox and Jack J. Dongarra, "Distributed and Cloud Computing: Clusters, Grids, Clouds and the Future of Internet", First Edition, Morgan Kaufman Publisher, an Imprint ofElsevier, 2012.

REFERENCES:

1. Jason Venner, "Pro Hadoop- Build Scalable, Distributed Applications in the Cloud", A Press, 2009
2. Tom White, "Hadoop The Definitive Guide", First Edition. O"Reilly, 2009.
3. Bart Jacob (Editor), "Introduction to Grid Computing", IBM Red Books, Vervante, 2005
4. Ian Foster, Carl Kesselman, "The Grid: Blueprint for a New Computing Infrastructure", 2nd Edition,Morgan Kaufmann.
5. Frederic Magoules and Jie Pan, "Introduction to Grid Computing" CRC Press, 2009.
6. Daniel Minoli, "A Networking Approach to Grid Computing", John Wiley Publication, 2005.
7. Barry Wilkinson, "Grid Computing: Techniques and Applications", Chapman and Hall, CRC, Taylorand Francis Group, 2010.

PRINCIPAL
idhaya Engineering College for Women
Vainarpalaym Road, Chinna SALEM-60620
Kallakurichi Taluk, Villupuram District

EC6703   **EMBEDDED AND REAL TIME SYSTEMS**   **L T P C**

                                                                                              3 0 0 3

OBJECTIVES:

The student should be made to:
- Learn the architecture and programming of ARM processor.
- Be familiar with the embedded computing platform design and analysis.
- Be exposed to the basic concepts of real time Operating system.
- Learn the system design techniques and networks for embedded systems

UNIT I   INTRODUCTION TO EMBEDDED COMPUTING AND ARM PROCESSORS   9

Complex systems and micro processors– Embedded system design process –Design example: Model train controller- Instruction sets preliminaries - ARM Processor – CPU: programming input and output- supervisor mode, exceptions and traps — Co-processors- Memory system mechanisms — CPU performance- CPU power consumption.

UNIT II   EMBEDDED COMPUTING PLATFORM   DESIGN   9

The CPU Bus-Memory devices and systems–Designing with computing platforms – consumer electronics architecture – platform-level performance analysis - Components for embedded programs- Models of programs- Assembly, linking and loading – compilation techniques- Program level performance analysis – Software performance optimization – Program level energy and power analysis and optimization – Analysis and optimization of program size- Program validation and testing.

UNIT III   PROCESSES AND OPERATING SYSTEMS   9

Introduction – Multiple tasks and multiple processes – Multirate systems- Preemptive real-time operating systems- Priority based scheduling- Interprocess communication mechanisms – Evaluating operating system performance- power optimization strategies for processes – Example Real time operating systems-POSIX-Windows CE.

UNIT V   SYSTEM DESIGN TECHNIQUES AND NETWORKS   9

Design methodologies- Design flows - Requirement Analysis – Specifications-System analysis and architecture design – Quality Assurance techniques- Distributed embedded systems – MPSoCs andshared memory multiprocessors.

UNIT V   CASE STUDY   9

Data compressor - Alarm Clock - Audio player - Software modem-Digital still camera - Telephone answering machine-Engine control unit – Video accelerator.

                                                                        TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course, students will be able to:
- Describe the architecture and programming of ARM processor.
- Outline the concepts of embedded systems
- Explain the basic concepts of real time Operating system design.
- Use the system design techniques to develop software for embedded systems
- Differentiate between the general purpose operating system and the real time operatingsystem
- Model real-time applications using embedded-system concepts

TEXT BOOK:
1. Marilyn Wolf, "Computers as Components - Principles of Embedded Computing System Design",Third Edition "Morgan Kaufmann Publisher (An imprint from Elsevier), 2012.

REFERENCES:
1. Jonathan W.Valvano, "Embedded Microcomputer Systems Real Time Interfacing", Third EditionCengage Learning, 2012.
2. David. E. Simon, "An Embedded Software Primer", 1st Edition, Fifth Impression, Addison-WesleyProfessional, 2007.
3. Raymond J.A. Buhr, Donald L.Bailey, "An Introduction to Real-Time Systems- From Design toNetworking with C/C++", Prentice Hall,1999.
4. C.M. Krishna, Kang G. Shin, "Real-Time Systems", International Editions, Mc Graw Hill 1997
5. K.V.K.K.Prasad, "Embedded Real-Time Systems: Concepts, Design & Programming", DreamTech Press, 2005.
6. Sriram V Iyer, Pankaj Gupta, "Embedded Real Time Systems Programming", Tata Mc Graw Hill,2004.

PRINCIPAL
idhaya Engineering College for Women
Nainarpalaym Road. CHINNASALEM-60620
Kallakurichi Taluk. Villupuram District

CS6008	HUMAN COMPUTER INTERACTION	L T P C
		3 0 0 3

OBJECTIVES:

The student should be made to:

- Learn the foundations of Human Computer Interaction.
- Be familiar with the design technologies for individuals and persons with disabilities.
- Be aware of mobile HCI.
- Learn the guidelines for user interface.

UNIT I   FOUNDATIONS OF HCI   9

The Human: I/O channels – Memory – Reasoning and problem solving; The computer: Devices – Memory – processing and networks; Interaction: Models – frameworks – Ergonomics – styles – elements – interactivity- Paradigms.

UNIT II   DESIGN & SOFTWARE PROCESS   9

Interactive Design basics — process — scenarios — navigation — screen design — Iteration and prototyping. HCI in software process – software life cycle – usability engineering – Prototyping in practice – design rationale. Design rules – principles, standards, guidelines, rules. Evaluation Techniques — Universal Design.

UNIT III   MODELS AND THEORIES   9

Cognitive models –Socio-Organizational issues and stake holder requirements –Communication and collaboration models-Hypertext, Multimedia and WWW.

UNIT IV   MOBILE HCI   9

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.

UNIT V   WEB INTERFACE DESIGN   9

Designing Web Interfaces — Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow. Case Studies.

L: 45, T: 0, TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course, the student should be able to:

- Design effective dialog for HCI.
- Design effective HCI for individuals and persons with disabilities.
- Assess the importance of user feedback.

TEXT BOOKS:

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, "Human Computer Interaction", 3rd Edition,Pearson Education, 2004 (UNIT I , II & III).

2. Brian Fling, "Mobile Design and Development", First Edition , O"Reilly Media Inc., 2009(UNIT –IV).

PRINCIPAL
idhaya Engineering College for Women
Nainarpalaym Road, CHINNASALEM-60620
kallakurichi Taluk, Villupuram District

PRIVACY PRESERVING IMAGE TRANSMISSION USING RANDOM PATTERN MOSIAC IMAGES STEGANOGRAPHY

A PROJECT REPORT

Submitted by

EZHILARASI. M   621114104007

KAVYA. K   621114104011

SANDHIYA. S   621114104028

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY :: CHENNAI-600 025

APRIL 2020

i

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY: CHENNAI-600 025

BONAFIDE CERTIFICATE

Certified that this project report "**PRIVACY PRESERVING IMAGE TRANSMISSION USING RANDOM PATTERN MOSIAC IMAGES STEGANOGRAPHY**" is the bonafide work of "**M. EZHILARASI, K. KAVYA, S. SANDHIYA**" who carried out the project work under my supervision.
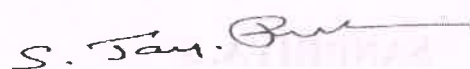
SIGNATURE

Dr. S. Jayasundar, M.E., Ph.D., M.B.A

HEAD OF THE DEPARTMENT

Associate Professor/CSE,

Idhaya Engineering College for Women,

Chinnasalem-606 201.

SIGNATURE

Mr. S. Jaya Prakash, M.E., (Ph.D)

SUPERVISOR

Associate Professor/CSE,

Idhaya Engineering College for Women,

Chinnasalem-606 201.

INTERNAL EXAMINER

EXTERNAL EXAMINER

ii

ABSTRACT

In this digital world, transferring sensitive data electronically has become inevitable. The objective of this work is to hide and retrieve confidential information in image mosaics. The photo mosaic approach has been used for the creation of the mosaic and the least significant bit (LSB) technique has been adopted for the embedding of the hidden information. The construction of the photo mosaic is done by selecting an image, splitting it into smaller images (tiles) of sizes 8x8, 16x16 and 32x32. These tiles are then compared from a very large amount of photos of the same sizes. Next, the user can either hide a secret image or a secret text into them. The final mosaic image contains secret information that is well-concealed and is impossible to find out with the naked eye. This technique is more robust compared to modifying the bits of the original image directly.

iv

Smart Bin for Waste Management System

A PROJECT REPORT

Submitted by

INFANTA QUEEN.T	**621116104009**
MANGAYARKARASI.RM	**621116104012**
RAMYA.M	**621116104022**

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY :: CHENNAI-600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.;
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY: CHENNAI-600 025

BONAFIDE CERTIFICATE

Certified that this project report **"SMART BIN FOR WASTE MANAGEMENT SYSTEM"** is the bonafide work of **"T.INFANTA QUEEN,RM.MANGAYAR KARASI,M.RAMYA"** who carried out the project work under my supervision.

SIGNATURE

SIGNATURE

Dr. S. Jayasundar, M.E., Ph.D., M.B.A

Mrs. K. Gandhimathi, M.E.,

HEAD OF THE DEPARTMENT

SUPERVISOR

Associate Professor/CSE,

Associate Professor/CSE,

Idhaya Engineering College for Women,

Idhaya Engineering College for Women,

Chinnasalem-606 201.

Chinnasalem-606 201.

INTERNAL EXAMINER

EXTERNAL EXAMINER

ii

ABSTRACT

The aim of the project is to manage the office wastes without making a trash retrieving. The main aim of the project is to destroy the office wastes like papers which have some official data in it. We use Heater and blower to turn such wastes into ashes. The IR sensor will be placed in the top of the dust bin and it will trigger the heater to burn the papers. The burned papers will be then turn off by spraying water. All these works will be done using Aurdinomicrocontroller.

iii

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

A SMART SYSTEM FOR MARKET THE AGRO PRODUCT BASED ON ANDROID APPLICATION

A PROJECT REPORT

Submitted by

DHANISHA BANU.A	**621116104006**
MERIE SMILIN.A	**621116104016**
SIMRAN.A	**621116104032**

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN CHINNASALEM
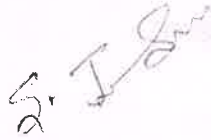
ANNA UNIVERSITY : CHENNAI-600 025

APRIL 2020

i

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY : CHENNAI-600 025

BONAFIDE CERTIFICATE

Certified that this project report "**A SMART SYSTEM FOR MARKET AGRO PRODUCTS BASED ON ANDROID APPLICATION**" is the bonafide work of "**A.DHANISHA BANU,A.MARIE SMILIN,A.SIMRAN**" who carried out the project work under my supervision.

SIGNATURE

Dr. S. Jayasundar., M.E., Ph.D., M.B.A.,
Associate Professor/CSE.

HEAD OF THE DEPARTMENT

Idhaya engineering college for women,

Chinnasalem-606 201.

SIGNATURE

Dr. S. Jayasundar., M.E., Ph.D., M.B.A.,
Associate Professor/CSE

SUPERVISOR

Idhaya engineering college for women,

Chinnasalem-606 201.

INTERNAL EXAMINER

EXTERNAL EXAMINER

ii

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

In this project, an online auction system is presented. It has a very large potential market of sellers and buyers. An On Line Transaction Processing (OLTP) database model structure is, therefore, desirable. The project involves the design and implementation of an online auction system. The analysis stage is performed first for the case study. Project begins by analyzing and presenting the OLTP database model for the online auction house. Besides, the intention to establish what goes on operationally within the online auction house. It also defines the layout in android application. In which many number of bidders bids the auction and final the auction won will store the result of the winning bidder details. And finally the shipment process will carried out. Key Words: Online auction, marketing, information and electronic commercial auction.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

DIAGONOSTIC TOOL FOR KIDNEY STONE DEDECTION USING CNN CLASSIFIER

A PROJECT REPORT

Submitted by

MANIMEGALAI.M	**621116104013**
RANJANI.M	**621116104024**
SAVITHRA	**621116104031**

in partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE ANDENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY :: CHENNAI-600 025

APRIL 2020

i

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY : CHENNAI-600 025
BONAFIDE CERTIFICATE

Certified that this project report **"DIAGNOSTIC TOOL FOR KIDNEY STONE DEDECTION USING CNN CLASSIFIER "** is the bonafide work of **"M.MANIMEGALAI,M.RANJANI,T.SAVITHRA"** who carried out the project work under my supervision.

SIGNATURE

Dr. S. Jayasundar, M.E., Ph.D., M.B.A

HEAD OF THE DEPARTMENT

Associate Professor/CSE,

Idhaya Engineering College for Women,

Chinnasalem-606 201.

SIGNATURE

Mrs. K. Gandhimathi, M.E.,

SUPERVISOR

Associate Professor/CSE,

Idhaya Engineering College for Women,

Chinnasalem-606 201.

INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

In 3D medical imaging, anatomical and other structures such as kidney stones are often identified and extracted with the aid of diagnosis and assessment of disease. Automatic kidney stone segmentation from abdominal CT images is challenging on the aspects of segmentation accuracy due to its variety of size,shape and location. The performance of 3D organ segmentation algorithm is also degraded by the image complexity containing multiple organs and because of their huge size. The current need is a preprocessing algorithm to assist the segmentation process. The objective of the present study was to develop reader independent preprocessing algorithm for kidney stone detection and segmentation in CT images. Three thresholding algorithms based on intensity, size and location are applied for unwanted regions removing such as soft-organ removing,bony skeleton removing and bed-mat removing. The digitized transverse abdomen CT scans images from 30 patients with kidney stone cases were included in statistical analysis and validation. As validation data for analysis, the estimation of coordinate points in stone region was measured independently by expert radiology.Experimental results prove that the proposed preprocessing algorithm has 95.24% sensitivity as the evaluation parameter. So, it can reduce the noise and unwanted regions in each procedure with good detection.

iii

SENTIMENTAL ANALYSIS

PROJECT REPORT

Submitted by

B.AMALA DARATHI	621116104003
S.ANITHA	621116104004
F.HASEENA PARVEEN	621116104008

In the partial fulfillment for the award of the degree

Of

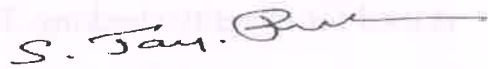## BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINERRING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY::CHENNAI 600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.I
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEI
CHINNASALEM-606 201. KALLAKURICHI D

ANNA UNIVERSITY :CHENNAI 600025

BONAFIDE CERTIFICATE

Certified that this project report **"SENTIMENT ALANALYSIS"** is the bonafied work of **B.AMALA DARATHI (621116104003), S.ANITHA (621116104004), F.HASEENA PARVEEN (621116104008)"** who carried out the mini project work under supervision.

SIGNATURE

SIGNATURE

DR.S.JAYASUNDARM.E,Ph.D,MBA

Sr.J.AROKIYAJAYAM.E,Ph.D

HEAD OF THE DEPARTMENT

SUPERVISOR

Idhaya engineering college for women

Assistant Professor/CSE

Chinnasalem-606201.

Idhaya engineering college for women

Chinnasalem-606201.

INTERNAL EXAMIER

EXTERNAL EXAMINER

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

With the advancementofweb technology and its growth, there is huge volume of data present in the web for internet users and a lot of data is generated too. Internet has become a platform for online learning, exchanging ideasandsharing opinions. Social networkingsiteslike Twitter, Face book, Google are rapidly gaining popularity as they allow people to share and express their views about topics, have discussion with different communities, or post messages across the world. There has been lot of work in the field of sentiment analysis of twitter data.Thissurvey focuses mainly on sentiment analysis of twitter data which is helpful to analyze the information in the tweets where opinions are highly unstructured, heterogeneous and are either positive or negative

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Image Hidng Process using Hybrid Cryptography and Steganography

A PROJECT REPORT

Submitted by

AISWARIYA.S	**621114104002**
MONIKHA.S	**621114104017**
NAZIYANSUSMITHA.G	**621114104020**

in partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY :: CHENNAI-600 025

APRIL 2020

i

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY: CHENNAI-600 025

BONAFIDE CERTIFICATE

Certified that this project report **"IMAGE HIDING PROCESS USING HYBRID CRYPTOGRAPHY AND STEGANOGRAPHY"** is the bonafide work of **"S. AISWARIYA, S. MONIKHA, G. NAZIYANSUSHMITHA"** who carried out the project work under my supervision.

SIGNATURE

Dr. S. Jayasundar, M.E., Ph.D., M.B.A

HEAD OF THE DEPARTMENT

Associate Professor/CSE,

Idhaya Engineering College for Women,

Chinnasalem-606 201.

SIGNATURE

Mr.S. Jaya Prakash, M.E., (Ph.D)

SUPERVISOR

Associate Professor/CSE,

Idhaya Engineering College for Women,

Chinnasalem-606 201.

INTERNAL EXAMINER

EXTERNAL EXAMINER

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Data/information is the most valuable asset for the modern electronic communication system. To secure data or information has become a challenge in this competitive world. There are many techniques for securing data/information such as cryptography, steganography etc. In this paper, hybrid cryptography has been applied using AES and RSA. In this hybrid cryptography, the symmetric key used for message encryption is also encrypted, which ensures a better security. An additional feature of this paper is to create a digital signature by encrypting the hash value of message. At the receiving side this digital signature is used for integrity checking. Then the encrypted message, encrypted symmetric key and encrypted digest are combined together to form a complete message. This is the complete message again has been secured using the steganography method, LSB. Here hybrid cryptography provides a better security, steganography strengthens the security. Message integrity checking is a special feature of this algorithm.and a Successful simulations have been shown to support the feasibility of this algorithm. Although cryptography and steganography could be used to provide data security, each of them has a problem. Cryptography problem is that, the cipher text looks meaningless, so the attacker will interrupt the transmission or make more careful checks on the data from the sender to the receiver. Steganography problem is that once the presence of hidden information is revealed or even suspected, the message is become known. According to the work in this project, a merged technique for data security has been proposed using Cryptography and Steganography techniques to improve the security of the information.

iii

VEHICLE EMISSION PREDICTION AND CONTROLLING

A PROJECT REPORT

Submitted by

ABIRAMI.R	**621116104001**
MONISHA.B	**621116104018**
PRESILLA KANIMOZHI.A	**621116104022**

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN
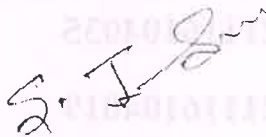
CHINNASALEM

ANNA UNIVERSITY : CHENNAI-600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY: CHENNAI-600 025

BONAFIDE CERTIFICATE

Certified that this project report "**VEHICLE EMISSION PREDICTION AND CONTROLLING**" is the bonafide work of "**R.ABIRAMI, B.MONISHA, A.PRESILLA KANIMOZHI** " who carried out the project work under my supervision.

SIGNATURE

Mr.S. JAYASUNDHAR, M.E.,Ph.D.

HEAD OF THE DEPARTMENT

Assistant Professor/CSE,

Idhaya engineering college for women,

Chinnasalem-606 201.

SIGNATURE

Mrs. S. Jeeva, M.E.,

SUPERVISOR

Assistant Professor/CSE,

Idhaya engineering college for women,

Chinnasalem-606 201.

INTERNAL EXAMINER

EXTERNAL EXAMINER

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

The presented study is composed of Vehicle routing problem with time windows. Also, it is designed to utilize the google maps to draw real routes together with the routes which are presented over graphs. Carbon dioxide emissions with spent time rates during the delivery are the main factors that are considered. Additionally, to basic factors such as, time windows, speed of a vehicle, demands of a customer and capacity of a vehicle. To be able to provide less CO_2 emission rates is also one of the most challenging problems about green energy. The results gained from real scenarios in Turkey show that there is a relationship between the followed path and CO_2 emissions.

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

IOT BASED AGRICULTURE LAND MONITORING SYSTEM

A PROJECT REPORT

Submitted by

MANIMOZHI.S	621116104014
SWETHA.S	621116104035
MURUGA SELVI.R	621116104019

in partial fulfillment for the award of the degree

Of

BACHELOR OF ENGINEERING

In

COMPUTER SCIENCE AND ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN
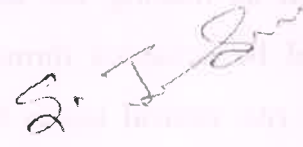
CHINNASALEM

ANNA UNIVERSITY :: CHENNAI-600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY:: CHENNAI-600 025

BONAFIDE CERTIFICATE

Certified that this project report "**IOT BASED AGRICULTURE LAND MONITORING SYSTEM**" is the bonafide work of "**S. MANIMZOHI, S. SWETHA, R.MURUGA SELVI**" who carried out the project work under my supervision.

SIGNATURE   **SIGNATURE**

Dr.S.JAYASUNDAR.,M.E., Ph.D   Sr. C.JANSI SOPHIA MARY.M.E.,(Ph.D)

HEAD OF THE DEPARTMENT   **SUPERVISOR**

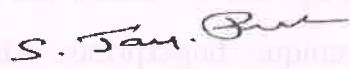Assistant Professor/CSE,   Associate Professor/CSE,

Idhaya engineering college for women,   Idhaya engineering college for women,

Chinnasalem-606 201.   Chinnasalem-606 201.

INTERNAL EXAMINER   **EXTERNAL EXAMINER**

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

The integration of modern information technologies into industrial agriculture already contributed to yield increases in the last decades. Nowadays, the emerging Internet of Things (IOT) along with Wireless Sensor Networks (WSNs) with their low-cost sensors and actors enable novel applications and new opportunities for a more precise, site-specific, and sustainable agriculture in the context of Smart Farming. In this paper, we present a holistic agricultural monitoring system, its design, and its architectural implementation. The system primarily focuses on in-situ assessment of the leaf area index (LAI), a very important crop parameter. Moreover, we introduce real-world challenges and experiences gained in various deployments. Finally, first results are exemplarily demonstrated in order to briefly address the potential of our system.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

FINGER PRINT BASED VOTING SYSTEM FOR ELECTION

A PROJECT REPORT

Submitted by

ARCHANA.R	**621116104005**
SAMREEN.T	**621116104026**
JESSIE RIYOSHNA MARY.R	**621114104010**

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY :: CHENNAI-600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

BONAFIDE CERTIFICATE

Certified that this project report "**FINGER PRINT BASED VOTING SYSTEM FOR ELECTION**" is the bonafide work of "**R.ARCHANA,T.SAMREEN,R.JESSIE** " who carried out the project work under my supervision.

SIGNATURE

Dr. S. Jayasundar, M.E., Ph.D., M.B.A

HEAD OF THE DEPARTMENT

Associate Professor/CSE,

Idhaya engineering college for women,

Chinnasalem-606 201.

SIGNATURE

Dr. S. Jayasundar, M.E., Ph.D., M.B.A

SUPERVISOR

Associate Professor/CSE,

Idhaya engineering college for women,

Chinnasalem-606 201.

INTERNAL EXAMINER

EXTERNAL EXAMINER

Dr.K.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

The proposed online voting system with biometric authentication is an electronic voting system which seeks to make use of the uniqueness of the minutiae of the human fingerprint to further enhance the level of trust and confidentiality of the voters in the system as well as making the actual process as universally accessible as possible which would be achieved through the deployment on the Internet. It is expected to solve the two critical issues facing staff elections conducted within the University of Ibadan community which serves as the project case study.

For the voter registration and authentication processes which are performed on the desktop module, the voter is expected to have his or her fingerprints captured and the minutiae extracted that is stored on the database. This is done to prevent the occurrence of multiple registrations or identity. Thus, during the authentication period, voters are expected to undergo a matching verification of their fingerprint samples against the values stored in the database which is identified through the use of a unique voter identification number assigned during registration

The project was able to achieve a high success rate in the use for conducting elections as it was able to stamp multiple registrations by voters through the combined use of both the unique voter identification number and their unique fingerprints. This effectively solved all questions that may arise on eligibility of voters and accreditation hiccups. Voters can thus proceed to the online module of the project to cast their votes through any internet – connected device using the voter identification number, security answer keyed in during the registration process as well as a token key that was generated automatically for each voter per election on the online module. The token is sent by the administrator to each voter through his or her associated email. Worthy to note is that though voting is now done ubiquitously, it must carried out during the stipulated period as contained in the email message sent to the voters.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

EE8552	POWER ELECTRONICS	L	T	P	C
		3	0	0	3

OBJECTIVES:
To impart knowledge on the following Topics

- Different types of power semiconductor devices and their switching
- Operation, characteristics and performance parameters of controlled rectifiers
- Operation, switching techniques and basics topologies of DC-DC switchingregulators.
- Different modulation techniques of pulse width modulated inverters and tounderstand harmonic reduction methods.
- Operation of AC voltage controller and various configurations.

UNIT I   POWER SEMI-CONDUCTOR DEVICES   9
Study of switching devices, SCR, TRIAC, GTO, BJT, MOSFET, IGBT and IGCT- Static characteristics: SCR, MOSFET and IGBT - Triggering and commutation circuit for SCR- Introduction to Driver and snubber circuits.

UNIT II   PHASE-CONTROLLED CONVERTERS   9
pulse, 3-pulse and 6-pulseconverters– performance parameters –Effect of source inductance— Firing Schemes for converter–Dual converters, Applications-light dimmer, Excitation system, Solar PV systems.

UNIT III   DC TO DC CONVERTERS   9
Step-down and step-up chopper-control strategy– Introduction to types of choppers-A, B, C,D and E -Switched mode regulators- Buck, Boost, Buck- Boost regulator, Introduction to Resonant Converters, Applications-Battery operated vehicles.

UNIT IV   INVERTERS   9
Single phase and three phase voltage source inverters (both120^0 mode and 180^0 mode)–Voltage& harmonic control-- PWM techniques: Multiple PWM, Sinusoidal PWM, modified sinusoidal PWM — Introduction to space vector modulation –Current source inverter, Applications-Induction heating, UPS.

UNIT V   AC TO AC CONVERTERS   9
Single phase and Three phase AC voltage controllers–Control strategy- Power Factor Control – Multistage sequence control -single phase and three phase cyclo converters –Introduction to Matrix converters, Applications –welding

                                                            TOTAL : 45 PERIODS

OUTCOMES:
- Ability to analyse AC-AC and DC-DC and DC-AC converters.
- Ability to choose the converters for real time applications.

TEXT BOOKS:
1. M.H. Rashid, 'Power Electronics: Circuits, Devices and Applications', PearsonEducation, Third Edition, New Delhi, 2004.
2. P.S.Bimbra "Power Electronics" Khanna Publishers, third Edition, 2003.
3. Ashfaq Ahmed 'Power Electronics for Technology', Pearson Education, Indianreprint, 2003.

REFERENCES
1. Joseph Vithayathil,' Power Electronics, Principles and Applications', McGraw HillSeries, 6th Reprint, 2013.
2. Philip T. Krein, "Elements of Power Electronics" Oxford University Press, 2004Edition.
3. L. Umanand, "Power Electronics Essentials and Applications", Wiley, 2010.
4. Ned Mohan Tore. M. Undel and, William. P. Robbins, 'Power Electronics:Converters, Applications and Design', John Wiley and sons, third edition, 2003.
5. S.Rama Reddy, 'Fundamentals of Power Electronics', Narosa Publications, 2014.
6. M.D. Singh and K.B. Khanchandani, "Power Electronics," Mc Graw Hill India, 2013.
7. JP Agarwal," Power Electronic Systems: Theory and Design" 1e, Pearson Education,2002.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Brand Reachers
Chennai
+91-9940554037
enquiry@brandreachers.com
www.brandreachers.com

REF: BR / OFF / IPT / 2019   Date : 14.06.2019

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. **BHARANI P** Reg.No: 621117105002 of **IDHAYA ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM,** have successfully completed INTERNSHIP from 04.06.2019 to 13.06.2019 in our premises.

We wish her all success in her future endeavors.

Warm regards,

For **Brand Reachers**

Proprietor

Saranya Balasubramaniam

FOUNDER & CEO

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Brand Reachers
Chennai
+91-9940554037
enquiry@brandreachers.com
www.brandreachers.com

REF: BR / OFF / IPT / 2019   **Date : 14.06.2019**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. CELCIYA L** Reg.No: 621117105003 of **IDHAYA ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM,** have successfully completed INTERNSHIP from 04.06.2019 to 13.06.2019 in our premises.

We wish her all success in her future endeavors.

Warm regards,

For **Brand Reachers**

Proprietor

Saranya Balasubramaniam

FOUNDER & CEO

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

REF: BR / OFF / IPT / 2019   **Date : 14.06.2019**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. GAYATHRI V** Reg.No: 621117105004 of **IDHAYA ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM,** have successfully completed INTERNSHIP from 04.06.2019 to 13.06.2019 in our premises.

We wish her all success in her future endeavors.

Warm regards,

For **Brand Reachers**

Proprietor

Saranya Balasubramaniam

FOUNDER & CEO

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Brand Reachers
Chennai
+91-9940554037
enquiry@brandreachers.com
www.brandreachers.com
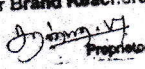
REF: BR / OFF / IPT / 2019   Date : 14.06.2019

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. PRIYADHARSHNI ALLWIN L** Reg.No: 621117105010 of

IDHAYA ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM, have successfully

completed INTERNSHIP from 04.06.2019 to 13.06.2019 in our premises.

We wish her all success in her future endeavors.

Warm regards,

For **Brand Reachers**

Proprietor

Saranya Balasubramaniam

FOUNDER & CEO

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Brand Reachers
Chennai
+91-9940554037
enquiry@brandreachers.com
www.brandreachers.com

REF: BR / OFF / IPT / 2019   **Date : 14.06.2019**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. RAJESHWARI R** Reg.No: 621117105011 of **IDHAYA ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM,** have successfully completed INTERNSHIP from 04.06.2019 to 13.06.2019 in our premises.

We wish her all success in her future endeavors.

Warm regards,

For **Brand Reachers**

Proprietor

Saranya Balasubramaniam

FOUNDER & CEO

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.;
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201, KALLAKURICHI DT.

Brand Reachers
Chennai
+91-9940554037
enquiry@brandreachers.com
www.brandreachers.com

REF: BR / OFF / IPT / 2019   **Date : 14.06.2019**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. SANTHINI A** Reg.No: 621117105012 of **IDHAYA ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM,** have successfully completed INTERNSHIP from 04.06.2019 to 13.06.2019 in our premises.

We wish her all success in her future endeavors.

Warm regards,

For **Brand Reachers**

Proprietor

Saranya Balasubramaniam

FOUNDER & CEO

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Brand Reachers
Chennai
+91-9940554037
enquiry@brandreachers.com
www.brandreachers.com

REF: BR / OFF / IPT / 2019   **Date : 14.06.2019**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. SUVITHA S** Reg.No: 621117105015 of **IDHAYA**

ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM, have successfully

completed INTERNSHIP from 04.06.2019 to 13.06.2019 in our premises.

We wish her all success in her future endeavors.

Warm regards,

For **Brand Reachers**

Proprietor

Saranya Balasubramaniam

FOUNDER & CEO

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Brand Reachers
Chennai
+91-9940554037
enquiry@brandreachers.com
www.brandreachers.com

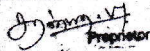**REF: BR / OFF / IPT / 2019**   **Date : 14.06.2019**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. UDHAYANILA V** Reg.No: 621117105016 of **IDHAYA ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM,** have successfully completed INTERNSHIP from 04.06.2019 to 13.06.2019 in our premises.

We wish her all success in her future endeavors.

Warm regards,

For **Brand Reachers**

Proprietor

Saranya Balasubramaniam

FOUNDER & CEO

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Brand Reachers
Chennai
+91-9940554037
enquiry@brandreachers.com
www.brandreachers.com

REF: BR / OFF / IPT / 2019   **Date : 14.06.2019**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. VEERAMMAL P** Reg.No: 621117105017 of **IDHAYA ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM,** have successfully completed INTERNSHIP from 04.06.2019 to 13.06.2019 in our premises.

We wish her all success in her future endeavors.

Warm regards,

For **Brand Reachers**
Proprietor

Saranya Balasubramaniam

FOUNDER & CEO

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EE8301   **ELECTRICAL MACHINES-I**   **L T P C**
                                                                               2 2 0 3

OBJECTIVES
To impart knowledge on the following Topics
- Magnetic-circuit analysis and introduce magnetic materials
- Constructional details, the principle of operation, prediction of performance, the methods of testing the transformers and three phase transformer connections.
- Working principles of electrical machines using the concepts of electromechanical energy conversion principles and derive expressions for generated voltage and torque developed in all Electrical Machines.
- Working principles of DC machines as Generator types, determination of their no- load/load characteristics, starting and methods of speed control of motors.
- Various losses taking place in D.C. Motor and to study the different testing methods to arrive at their performance.

UNIT I   MAGNETIC CIRCUITS AND MAGNETIC MATERIALS   **6+6**
Magnetic circuits –Laws governing magnetic circuits - Flux linkage, Inductance and energy – Statically and Dynamically induced EMF - Torque — Properties of magnetic materials, Hysteresis and Eddy Current losses - AC excitation, introduction to permanent magnets- Transformer as a magnetically coupled circuit.

UNIT II   TRANSFORMERS   **6+6**
Construction – principle of operation – equivalent circuit parameters – phasor diagrams, losses – testing – efficiency and voltage regulation-all day efficiency-Sumpner's test, per unit representation – inrush current - three phase transformers-connections – Scott Connection– Phasing of transformer– parallel operation of three phase transformers-auto transformer –tap changing transformers- tertiary winding.

UNIT III ELECTROMECHANICAL ENERGY CONVERSION AND CONCEPTS IN ROTATING MACHINES
                                                                               6+6

Energy in magnetic system – Field energy and co energy-force and torque equations – singly and multiply excited magnetic field systems-mmf of distributed windings – Winding Inductances-, magnetic fields in rotating machines – rotating mmf waves – magnetic saturation and leakage fluxes.

UNIT IV   DC GENERATORS   **6+6**
Construction and components of DC Machine — Principle of operation - Lap and wave windings-EMF equations– circuit model — armature reaction –methods of excitation- commutation - interpoles compensating winding – characteristics of DC generators.

UNIT V   DC MOTORS   **6+6**
Principle and operations - types of DC Motors – Speed Torque Characteristics of DC Motors- starting and speed control of DC motors –Plugging, dynamic and regenerative braking- testing and efficiency – Retardation test- Swinburne's test and Hopkinson's test - Permanent Magnet DC (PMDC)motors-applications of DC Motor

                                                    TOTAL : 60 PERIODS

OUTCOMES:
- Ability to analyze the magnetic-circuits.
- Ability to acquire the knowledge in constructional details of transformers.
- Ability to acquire the knowledge in working principles of DC Generator.
- Ability to acquire the knowledge in working principles of DC Motor
- Ability to acquire the knowledge in various losses taking place in D.C. Machines

TEXT BOOKS:
1. Stephen J. Chapman, 'Electric Machinery Fundamentals'4th edition, McGraw HillEducation Pvt. Ltd, 2010.
2. P.C. Sen'Principles of Electric Machines and Power Electronics' John Wiley & Sons;3rd Edition 2013.
3. Nagrath, I.J. and Kothari.D.P., Electric Machines', McGraw-Hill Education, 2004

REFERENCES
1. Theodore Wildi, "Electrical Machines, Drives, and Power Systems", PearsonEducation., (5th Edition), 2002.
2. B.R. Gupta ,'Fundamental of Electric Machines' New age International Publishers,3[rd]Edition ,Reprint 2015.
3. S.K. Bhattacharya, 'Electrical Machines' McGraw - Hill Education, New Delhi, 3[rd]Edition,2009.
4. Vincent Del Toro, 'Basic Electric Machines' Pearson India Education, 2016.
5. Surinder Pal Bali, 'Electrical Technology Machines & Measurements, Vol.II, Pearson,2013.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EE8402   **TRANSMISSION AND DISTRIBUTION**   L   T   P   C
                                                                                  3   0   0   3

OBJECTIVES:

- To study the structure of electric power system and to develop expressions for thecomputation of transmission line parameters.
- To obtain the equivalent circuits for the transmission lines based on distance and todetermine voltage regulation and efficiency.
- To understand the mechanical design of transmission lines and to analyze thevoltage distribution in insulator strings to improve the efficiency.
- To study the types, construction of cabilitys and methods to improve the efficiency.
- To study about distribution systems, types of substations, methods of grounding,EHVAC, HVDC and FACTS.

UNIT I   TRANSMISSION LINE PARAMETERS   9

Structure of Power System - Parameters of single and three phase transmission lines with single and double circuits - Resistance, inductance and capacitance of solid, stranded and bundled conductors, Symmetrical and unsymmetrical spacing and transposition - applicationof self and mutual GMD; skin and proximity effects -Typical configurations, conductor types and electrical parameters of EHV lines.

UNIT II   MODELLING AND PERFORMANCE OF TRANSMISSION LINES   9

Performance of Transmission lines - short line, medium line and long line - equivalent circuits, phasor diagram, attenuation constant, phase constant, surge impedance -transmission efficiency and voltage regulation, real and reactive power flow in lines - Power Circle diagrams - Formation of Corona – Critical Voltages – Effect on Line Performance.

UNIT III   MECHANICAL DESIGN OF LINES   9

Mechanical design of OH lines — Line Supports –Types of towers — Stress and Sag Calculation — Effects of Wind and Ice loading. Insulators: Types, voltage distribution in insulator string, improvement of string efficiency, testing of insulators.

UNIT IV   UNDER GROUND CABILITYS   9

Underground cabilitys - Types of cabilitys – Construction of single core and 3 core Cabilitys - Insulation Resistance – Potential Gradient - Capacitance of Single-core and 3 core cabilitys - Grading of cabilitys - Power factor and heating of cabilitys– DC cabilitys.

UNIT V   DISTRIBUTION SYSTEMS   9

Distribution Systems — General Aspects — Kelvin's Law — AC and DC distributions - Techniques of Voltage Control and Power factor improvement – Distribution Loss –Typesof Substations -Methods of Grounding – Trends in Transmission and Distribution: EHVAC, HVDC and FACTS (Qualitative treatment only).

                                              TOTAL :   45   PERIODS

OUTCOMES:

- To understand the importance and the functioning of transmission line parameters.
- To understand the concepts of Lines and Insulators.
- To acquire knowledge on the performance of Transmission lines.
- To understand the importance of distribution of the electric power in power system.
- To acquire knowledge on Underground Cabilitys
- To become familiar with the function of different components used in Transmissionand Distribution levels of power system and modelling of these components.

TEXT BOOKS:

1. D.P.Kothari, I.J. Nagarath, 'Power System Engineering', Mc Graw-Hill PublishingCompany limited, New Delhi, Second Edition, 2008.
2. C.L.Wadhwa, 'Electrical Power Systems', New Academic Science Ltd, 2009.
3. S.N. Singh, 'Electric Power Generation, Transmission and Distribution', Prentice Hallof India Pvt. Ltd, New Delhi, Second Edition, 2011.

REFERENCES

1. B.R.Gupta, 'Power System Analysis and Design' S. Chand, New Delhi, Fifth Edition,2008.
2. Luces M.Fualken berry, Walter Coffer, 'Electrical Power Distribution and Transmission', Pearson Education, 2007.
3. Arun Ingole, "power transmission and distribution" Pearson Education, 2017
4. J.Brian, Hardy and Colin R.Bayliss 'Transmission and Distribution in ElectricalEngineering', Newnes; Fourth Edition, 2012.
5. G.Ramamurthy, "Handbook of Electrical power Distribution," Universities Press,2013.
6. V.K.Mehta, Rohit Mehta, 'Principles of power system', S. Chand & Company Ltd,New Delhi, 2013

M Gmail   Kumar Chinnasamy <srikumareee@gmail.com>

IV-PERMISSION LETTER-IDHAYA ENGINEERING COLLEGE

Padmavahini Transformers <info@padmavahini.in>   Wed, Feb 12, 2020 at 4:46 PM
To: "c.kumar" <srikumareee@gmail.com>
Cc: stores-padmavahini <stores@padmavahinitransformers.com>

Permission granted.

For further assistance coordinate with our Mr.Ganesh Babu at 99430 46222.

With Regards,

R.Vathirajan
Managing Director
Padmavahini Transformers (P) Ltd.
(An ISO 9001 : 2015 Certified Company)
S.F.No.353/1, Door No.7/140, Ruby Matriculation School Road
Keeranatham, Saravanampatti
Coimbatore - 641 035
Tamilnadu, India
Mobile : +91 98430 41222
Website : www.padmavahini.in
             www.padmavahini.com

Skype: **Vathirajan Raghupathy**

[Quoted text hidden]

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT

IDHAYA ENGINEERING COLLEGE FOR WOMEN

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.
An ISO 9001 : 2015 Certified Institution
(A Unit of the Franciscan Sisters of the Immaculate Heart of Mary Society, Pondicherry)

Ref: IECW / EEE & ECE / IV / 2020

Date:.. 06.02.2020 ...

To

Padmavahini Transformers Private Limited
S. F. No. 353/1, Door No. 7/140,
Ruby Matriculation School Road,
Keeranatham, Saravanampatti,
Coimbatore, Tamil Nadu 641035

Dear Sir,

**Sub: Permission for undergoing Industrial Visit your Transformer Company
– Reg.**

Our Students of Idhaya Engineering College for women studying Second and Third year B.E EEE & ECE students are interested to undergo industrial visit to your Transformer Company. We hope that this visit will boost their confidence and also enrich their subject knowledge about the transformer. So I request you to grant permission to undergo visit on 15th February 2020. I assure you that they will abide by the rules and regulations stipulated by your office.

No. of Students	: EEE- 15 + 9 = 24
	ECE- 25 + 16 = 41
No. of Staff	: 06

Staff In charge:-
Mr.C.Kumar, AP/EEE
Mob: 9791719103
Mr.M.Mahesh, AP/ECE
Mob: 7502992396

Thank you

Yours faithfully

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201, Villupuram Dt.

IDHAYA ENGINEERING COLLEGE FOR WOMEN
CHINNASALEM – 606 201.
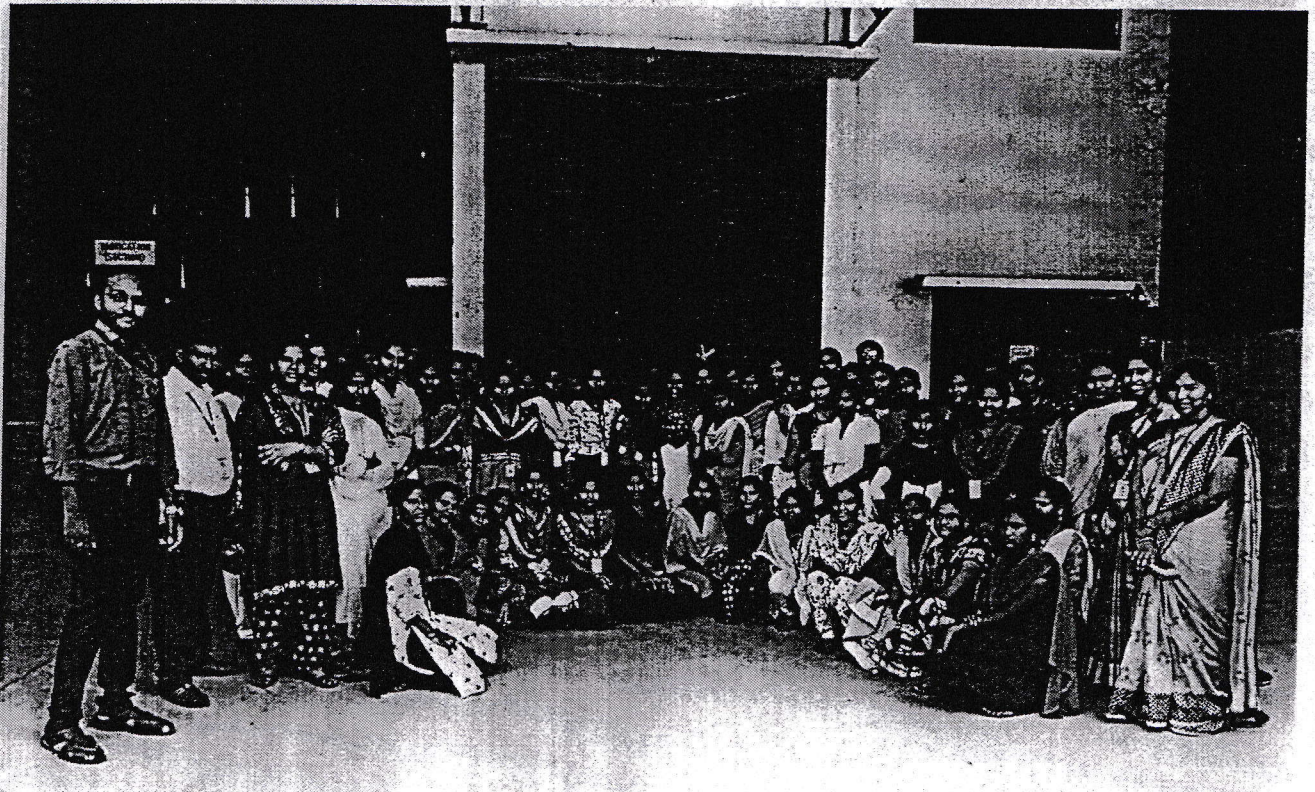
Department of Electrical and Electronics Engineering/
Electronics & Communication Engineering

Place: Coimbatore   Day: (One day -15.02.2020)

Industrial Visit and Educational tour Report

IECW organized a one day Industrial Visit and Educational Tour to Padmavahini Transformer Pvt. Ltd , Coimbatore for II and III year students of EEE and ECE department. The tour was organized with prior permission and guidance from Principal. This tour gave a wide expo to the students. Totally 59 Students along with 4 faculty members had joined in this grand endeavour.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT

M Gmail

Industrial Visit - Idhaya Engg college for women

Antuvan DS <ds_antuvan@vssc.gov.in>   Mon, Jul 8, 2019 at 10:25 AM
To: karthikeyan vadivel <karthikeyaniecw@gmail.com>

Dear Prof.Karthikeyan,

Nice to see your letter and the interest of your students undertaking a visit to VSSC/ISRO.

You are most welcome to come over here and we shall orange necessary pass for the visit.

I hope to be there with your team after return from Chandrayaan-II launch at Shriharikota.

Regads

DS Antuvan

Senior Scientist, VSSC/ISRO

[Quoted text hidden]

📄 **ISRO-IV.pdf**
927K

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

IDHAYA ENGINEERING COLLEGE FOR WOMEN

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.
An ISO 9001 : 2015 Certified Institution
(A Unit of the Franciscan Sisters of the Immaculate Heart of Mary Society, Pondicherry)

Date: 5/07/19

REF: IECW / ADM / IND.VISIT / 2019

To

Shri. D. S. Antuvan,
Senior Scientist,
Vikram Sarabhai Space Centre,
Thiruvananthapuram,
Kerala, India, Pin Code:695022

Sir,

Sub: Request for permission to visit your Research center – Final year CSE,
EEE, ECE & IT students – Reg.

Greetings from Idhaya Engineering College for Women, Chinnasalem.

Idhaya Engineering College for Women is established and managed by Franciscan Sister of the Immaculate Heart of Mary Congregation to provide quality technical and professional education to the deserving women candidates. As a part of their regular curricular activities, every student has to undergo one industrial visit for every theory course offered. Our students of 4th year CSE, EEE, ECE & IT are very much interested to visit your center. So I am writing this letter to seek permission to visit preferably on 17th July, 2019.

Kindly give an orientation of the various facilities available at your center and we would be grateful for the same. We hope for your positive response at the earliest.

Total No. of students : 89

No. of staff members accompanying : 06

Thank you

Yours faithfully

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGINEERING COLLEGE FOR WOMEN
CHINNASALEM-606 201. VILLUPURAM DIST.

REF: IECW / CSE, EEE, ECE & IT / IV / 2019   Date: 25.07.2019

Department of CSE, EEE, ECE and IT

Place: Kerala   Days: (17th to 19th July 2019)

Industrial Visit and Educational tour Report

IECW organized a 3 days Industrial Visit and Educational Tour to ISRO, Trivandrum, from 17.07.2019 to 19.07.2019 for final year Students of CSE, EEE, ECE and IT department. The tour was organized with the prior permission and guidance from Principal. This tour gave a wide expo to the students. Totally 87 students along with 6 faculty member had joined in this grand endeavour.

DAY 1 (17/07/2019) –ISRO-Trivandrum

Visited Rocket launching at 12.00 p.m, Kovalam beach and Sree Padmanabhaswamy Temple.

DAY 2 (18/07/2019) –Kerala

Visited Thirparappu falls, Padmanabhaswamy palace and Church

DAY 3 (19/07/2019) – Kanyakumari

Visited Sunrise,Vivenkanda rock,Thiruvalluvar statue and Madurai meenachi amman temple.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.I&
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT

IV COORDINATOR

EE8351   DIGITAL LOGIC CIRCUITS   L   T   P   C
                                                                        2   2   0   3

OBJECTIVES:
- To study various number systems and simplify the logical expressions using Booleanfunctions
- To study combinational circuits
- To design various synchronous and asynchronous circuits.
- To introduce asynchronous sequential circuits and PLDs
- To introduce digital simulation for development of application oriented logic circuits.

UNIT I   NUMBER SYSTEMS AND DIGITAL LOGIC FAMILIES   6+6
Review of number systems, binary codes, error detection and correction codes (Parity and Hamming code) - Digital Logic Families -comparison of RTL, DTL, TTL, ECL and MOS families -operation, characteristics of digital logic family.

UNIT II   COMBINATIONAL CIRCUITS

                                                                                6+6
Combinational logic - representation of logic functions-SOP and POS forms, K-map representations - minimization using K maps - simplification and implementation of combinational logic — multiplexers and de multiplexers - code converters, adders, subtractors, Encoders and Decoders.

UNIT III   SYNCHRONOUS SEQUENTIAL CIRCUITS   6+6
Sequential logic- SR, JK, D and T flip flops - level triggering and edge triggering - counters - asynchronous and synchronous type - Modulo counters - Shift registers - design ofsynchronous sequential circuits — Moore and Melay models- Counters, state diagram; statereduction; state assignment.

UNIT IV ASYNCHRONOUS SEQUENTIAL CIRCUITS ANDPROGRAMMABILITY LOGIC DEVICES   6+6
Asynchronous sequential logic circuits-Transition tability, flow tability-race conditions, hazards &errors in digital circuits; analysis of asynchronous sequential logic circuits- introduction to Programmability Logic Devices: PROM — PLA –PAL, CPLD-FPGA.

UNIT V   VHDL   6+6
RTL Design — combinational logic — Sequential circuit — Operators — Introduction to Packages – Subprograms – Test bench. (Simulation /Tutorial Examples: adders, counters,flip flops, Multiplexers & De multiplexers).

                                        TOTAL :   60   PERIODS

OUTCOMES:

- Ability to design combinational and sequential Circuits.
- Ability to simulate using software package.
- Ability to study various number systems and simplify the logical expressions usingBoolean functions
- Ability to design various synchronous and asynchronous circuits.
- Ability to introduce asynchronous sequential circuits and PLDs
- Ability to introduce digital simulation for development of application oriented logiccircuits.

TEXT BOOKS:
1.   James W. Bignel, Digital Electronics, Cengage learning, 5th Edition, 2007.

2.   M. Morris Mano, 'Digital Design with an introduction to the VHDL', PearsonEducation, 2013.

3.   Comer "Digital Logic & State Machine Design, Oxford, 2012.

REFERENCES
1.   Mandal, "Digital Electronics Principles & Application, McGraw Hill Edu, 2013.

2.   William Keitz, Digital Electronics-A Practical Approach with VHDL, Pearson, 2013.

3.   Thomas L.Floyd, 'Digital Fundamentals', 11th edition, Pearson Education, 2015.

4.   Charles H.Roth, Jr, Lizy Lizy Kurian John, 'Digital System Design using VHDL, Cengage,2013.

5.   D.P.Kothari,J.S.Dhillon, 'Digital circuits and Design',Pearson Education, 2016.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT,

EE8391	ELECTROMAGNETIC THEORY	L	T	P	C
		2	2	0	3

OBJECTIVES:

- To introduce the basic mathematical concepts related to electromagnetic vector fields
- To impart knowledge on the concepts of
  - ✓ Electrostatic fields, electrical potential, energy density and their applications.
  - ✓ Magneto static fields, magnetic flux density, vector potential and its applications.
  - ✓ Different methods of emf generation and Maxwell's equations
  - ✓ Electromagnetic waves and characterizing parameters

UNIT I   ELECTROSTATICS – I   6+6

Sources and effects of electromagnetic fields – Coordinate Systems – Vector fields –Gradient, Divergence, Curl – theorems and applications - Coulomb's Law – Electric field intensity – Field due to discrete and continuous charges – Gauss's law and applications.

UNIT II   ELECTROSTATICS – II   6+6

Electric potential — Electric field and equipotential plots, Uniform and Non-Uniform field, Utilization factor — Electric field in free space, conductors, dielectrics - Dielectric polarization —Dielectric strength - Electric field in multiple dielectrics — Boundary conditions, Poisson's and Laplace's equations, Capacitance, Energy density, Applications.

UNIT III   MAGNETOSTATICS   6+6

Lorentz force, magnetic field intensity (H) — Biot–Savart's Law - Ampere's Circuit Law — H due tostraight conductors, circular loop, infinite sheet of current, Magnetic flux density (B) — B in free space, conductor, magnetic materials — Magnetization, Magnetic field in multiple media — Boundary conditions, scalar and vector potential, Poisson's Equation, Magnetic force, Torque, Inductance, Energy density, Applications.

UNIT IV   ELECTRODYNAMIC FIELDS   6+6

Magnetic Circuits - Faraday's law – Transformer and motional EMF – Displacement current - Maxwell's equations (differential and integral form) – Relation between field theory and circuit theory — Applications.

UNIT V   ELECTROMAGNETIC WAVES   6+6

Electromagnetic wave generation and equations — Wave parameters; velocity, intrinsic impedance, propagation constant — Waves in free space, lossy and lossless dielectrics, conductors- skin depth - Poynting vector — Plane wave reflection and refraction.

TOTAL : 60 PERIODS

OUTCOMES:

- Ability to understand the basic mathematical concepts related to electromagnetic vectorfields.
- Ability to understand the basic concepts about electrostatic fields, electrical potential, energy density and their applications.
- Ability to acquire the knowledge in magneto static fields, magnetic flux density, vector potential and its applications.
- Ability to understand the different methods of emf generation and Maxwell's equations
- Ability to understand the basic concepts electromagnetic waves and characterizingparameters
- Ability to understand and compute Electromagnetic fields and apply them for design and analysis of electrical equipment and systems

TEXT BOOKS:

1. Mathew N. O. Sadiku, 'Principles of Electromagnetics', 6th Edition, Oxford UniversityPress Inc. Asian edition, 2015.
2. William H. Hayt and John A. Buck, 'Engineering Electromagnetics', McGraw Hill SpecialIndian edition, 2014.
3. Kraus and Fleish, 'Electromagnetics with Applications', McGraw Hill InternationalEditions, Fifth Edition, 2010.

REFERENCES

1. V.V.Sarwate, 'Electromagnetic fields and waves', First Edition, Newage Publishers,1993.
2. J.P.Tewari, 'Engineering Electromagnetics - Theory, Problems and Applications', Second Edition, Khanna Publishers.
3. Joseph. A.Edminister, 'Schaum's Outline of Electromagnetics, Third Edition (Schaum'sOutline Series), McGraw Hill, 2010.
4. S.P.Ghosh, Lipika Datta, 'Electromagnetic Field Theory', First Edition, McGraw HillEducation(India) Private Limited, 2012.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EE8301   ELECTRICAL MACHINES-I   L T P C
                                                                       2 2 0 3

OBJECTIVES

To impart knowledge on the following Topics

- Magnetic-circuit analysis and introduce magnetic materials

- Constructional details, the principle of operation, prediction of performance, the methods of testing the transformers and three phase transformer connections.

- Working principles of electrical machines using the concepts of electromechanical energy conversion principles and derive expressions for generated voltage and torque developed in all Electrical Machines.

- Working principles of DC machines as Generator types, determination of their no- load/load characteristics, starting and methods of speed control of motors.

- Various losses taking place in D.C. Motor and to study the different testing methods to arrive at their performance.

UNIT I   MAGNETIC CIRCUITS AND MAGNETIC MATERIALS   6+6

Magnetic circuits –Laws governing magnetic circuits - Flux linkage, Inductance and energy – Statically and Dynamically induced EMF - Torque – Properties of magnetic materials, Hysteresis and Eddy Current losses - AC excitation, introduction to permanent magnets- Transformer as a magnetically coupled circuit.

UNIT II   TRANSFORMERS   6+6

Construction – principle of operation – equivalent circuit parameters – phasor diagrams, losses – testing – efficiency and voltage regulation-all day efficiency-Sumpner's test, per unit representation – inrush current - three phase transformers-connections – Scott Connection– Phasing of transformer– parallel operation of three phase transformers-auto transformer –tap changing transformers- tertiary winding.

UNIT III ELECTROMECHANICAL ENERGY CONVERSION AND CONCEPTS IN ROTATING MACHINES   6+6

Energy in magnetic system – Field energy and co energy-force and torque equations – singly and multiply excited magnetic field systems-mmf of distributed windings – Winding Inductances-, magnetic fields in rotating machines – rotating mmf waves – magnetic saturation and leakage fluxes.

UNIT IV   DC GENERATORS   6+6

Construction and components of DC Machine — Principle of operation - Lap and wave windings-EMF equations– circuit model — armature reaction –methods of excitation- commutation - interpoles compensating winding – characteristics of DC generators.

UNIT V   DC MOTORS   6+6

Principle and operations - types of DC Motors – Speed Torque Characteristics of DC Motors- starting and speed control of DC motors –Plugging, dynamic and regenerative braking- testing and efficiency – Retardation test- Swinburne's test and Hopkinson's test - Permanent Magnet DC (PMDC)motors-applications of DC
Motor

                                                                       TOTAL : 60 PERIODS

OUTCOMES:

- Ability to analyze the magnetic-circuits.

- Ability to acquire the knowledge in constructional details of transformers.

- Ability to acquire the knowledge in working principles of DC Generator.

- Ability to acquire the knowledge in working principles of DC Motor

- Ability to acquire the knowledge in various losses taking place in D.C. Machines

TEXT BOOKS:

1.   Stephen J. Chapman, 'Electric Machinery Fundamentals'4th edition, McGraw HillEducation Pvt. Ltd, 2010.
2.   P.C. Sen'Principles of Electric Machines and Power Electronics' John Wiley & Sons;3rd Edition 2013.
3.   Nagrath, I.J. and Kothari.D.P., Electric Machines', McGraw-Hill Education, 2004

REFERENCES

1.   Theodore Wildi, "Electrical Machines, Drives, and Power Systems", PearsonEducation., (5th Edition), 2002.
2.   B.R. Gupta ,'Fundamental of Electric Machines' New age International Publishers,3[rd]Edition ,Reprint 2015.
3.   S.K. Bhattacharya, 'Electrical Machines' McGraw - Hill Education, New Delhi, 3[rd]Edition,2009.
4.   Vincent Del Toro, 'Basic Electric Machines' Pearson India Education, 2016.
5.   Surinder Pal Bali, 'Electrical Technology Machines & Measurements, Vol.II, Pearson,2013.

OBJECTIVES:

The student should be made to:
- Understand the structure of basic electronic devices.
- Be exposed to active and passive circuit elements.
- Familiarize the operation and applications of transistor like BJT and FET.
- Explore the characteristics of amplifier gain and frequency response.
- Learn the required functionality of positive and negative feedback systems.

UNIT I   **PN JUNCTION DEVICES**   9

PN junction diode –structure, operation and V-I characteristics, diffusion and transition capacitance - Rectifiers — Half Wave and Full Wave Rectifier,– Display devices- LED, Laser diodes, Zener diodecharacteristics- Zener Reverse characteristics — Zener as regulator

UNIT II   **TRANSISTORS AND THYRISTORS**   9

BJT, JFET, MOSFET- structure, operation, characteristics and Biasing UJT, Thyristors and IGBT - Structure and characteristics.

UNIT III   **AMPLIFIERS**   9

BJT small signal model – Analysis of CE, CB, CC amplifiers- Gain and frequency response –MOSFET small signal model– Analysis of CS and Source follower — Gain and frequency response- High frequency analysis.

UNIT IV   **MULTISTAGE AMPLIFIERS AND DIFFERENTIAL AMPLIFIER**   9

BIMOS cascade amplifier, Differential amplifier – Common mode and Difference mode analysis – FET input stages – Single tuned amplifiers – Gain and frequency response – Neutralization methods, power amplifiers –Types (Qualitative analysis).

UNIT V   **FEEDBACK AMPLIFIERS AND OSCILLATORS**   9

Advantages of negative feedback – voltage / current, series , Shunt feedback –positive feedback – Condition for oscillations, phase shift – Wien bridge, Hartley, Colpitts and Crystal oscillators.

TOTAL : 45 PERIODS

OUTCOMES:

Upon Completion of the course, the students will be ability to:
- Explain the structure and working operation of basic electronic devices.
- Able to identify and differentiate both active and passive elements
- Analyze the characteristics of different electronic devices such as diodes andtransistors
- Choose and adapt the required components to construct an amplifier circuit.
- Employ the acquired knowledge in design and analysis of oscillators

TEXT BOOKS:
1. . David A. Bell ,"Electronic devices and circuits", Oxford University higher education, 5th edition 2008.
2. Sedra and smith, "Microelectronic circuits",7th Ed., Oxford University Press

REFERENCES:
1. Balbir Kumar, Shail.B.Jain, "Electronic devices and circuits" PHI learning private limited, 2nd edition2014.
2. Thomas L.Floyd, "Electronic devices" Conventional current version, Pearson prentice hall, 10th Edition, 2017.
3. Donald A Neamen, "Electronic Circuit Analysis and Design" Tata McGraw Hill, 3rd Edition, 2003.
4. Robert L.Boylestad, "Electronic devices and circuit theory", 2002.
5. Robert B. Northrop, "Analysis and Application of Analog Electronic Circuits to BiomedicalInstrumentation", CRC Press, 2004.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EE8401	ELECTRICAL MACHINES – II	L	T	P	C
		2	2	0	3

OBJECTIVES:
To impart knowledge on the following Topics
- Construction and performance of salient and non — salient type synchronousgenerators.
- Principle of operation and performance of synchronous motor.
- Construction, principle of operation and performance of induction machines.
- Starting and speed control of three-phase induction motors.
- Construction, principle of operation and performance of single phase inductionmotors and special machines.

UNIT I   SYNCHRONOUS GENERATOR   6+6
Constructional details – Types of rotors –winding factors- emf equation – Synchronous reactance – Armature reaction – Phasor diagrams of non salient pole synchronous generator connected to infinite bus--Synchronizing and parallel operation – Synchronizing torque -Change of excitation and mechanical input- Voltage regulation – EMF, MMF, ZPFand A.S.A methods – steady state power- angle characteristics– Two reaction theory –sliptest -short circuit transients - Capability Curves

UNIT II   SYNCHRONOUS MOTOR   6+6
Principle of operation – Torque equation – Operation on infinite bus bars - V and Inverted V curves – Power input and power developed equations – Starting methods – Current loci forconstant power input, constant excitation and constant power developed-Hunting – natural frequency of oscillations – damper windings- synchronous condenser.

UNIT III   THREE PHASE INDUCTION MOTOR   6+6
Constructional details — Types of rotors –- Principle of operation — Slip –cogging and crawling- Equivalent circuit – Torque-Slip characteristics - Condition for maximum torque –Losses and efficiency – Load test - No load and blocked rotor tests - Circle diagram — Separation of losses – Double cage induction motors –Induction generators – Synchronousinduction motor.

UNIT IV STARTING AND SPEED CONTROL OF THREE PHASE INDUCTION MOTOR   6+6
Need for starting – Types of starters – DOL, Rotor resistance, Autotransformer and Star- delta starters – Speed control – Voltage control, Frequency control and pole changing – Cascaded connection-V/f control – Slip power recovery scheme-Braking of three phase induction motor: Plugging, dynamic braking and regenerative braking.

UNIT V   SINGLE PHASE INDUCTION MOTORS AND SPECIAL MACHINES   6+6
Constructional details of single phase induction motor – Double field revolving theory and operation – Equivalent circuit – No load and blocked rotor test – Performance analysis – Starting methods of single-phase induction motors – Capacitor-start capacitor run Induction motor- Shaded pole induction motor - Linear induction motor — Repulsion motor - Hysteresis motor - AC series motor- Servo motors- Stepper motors - introduction to magnetic levitation systems.

                                                         TOTAL :   60   PERIODS

OUTCOMES:
- Ability to understand the construction and working principle of SynchronousGenerator
- Ability to acquire knowledge on Synchronous motor.
- Ability to understand the construction and working principle of Three phase InductionMotor
- Ability to understand the construction and working principle of Special Machines
- Ability to predetermine the performance characteristics of Synchronous Machines.

TEXT BOOKS:
1. A.E. Fitzgerald, Charles Kingsley, Stephen. D. Umans, 'Electric Machinery', Mc GrawHill publishing Company Ltd, 2003.
2. Vincent Del Toro, 'Basic Electric Machines' Pearson India Education, 2016.
3. Stephen J. Chapman, 'Electric Machinery Fundamentals'4th edition, McGraw HillEducation Pvt. Ltd, 2010.

REFERENCES
1. D.P. Kothari and I.J. Nagrath, 'Electric Machines', McGraw Hill PublishingCompany Ltd, 2002.
2. P.S. Bhimbhra, 'Electrical Machinery', Khanna Publishers, 2003.
3. M.N. Bandyopadhyay, Electrical Machines Theory and Practice, PHI Learning PVTLTD., New Delhi, 2009.
4. B.R.Gupta, 'Fundamental of Electric Machines' New age International Publishers,3[rd]Edition ,Reprint 2015.
5. Murugesh Kumar, 'Electric Machines', Vikas Publishing House Pvt. Ltd, 2002.
6. Alexander S. Langsdorf, 'Theory of Alternating-Current Machinery', McGraw HillPublications, 2001.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EE8403	MEASUREMENTS AND INSTRUMENTATION	L	T	P	C
		3	0	0	3

OBJECTIVES:

To impart knowledge on the following Topics

- Basic functional elements of instrumentation
- Fundamentals of electrical and electronic instruments
- Comparison between various measurement techniques
- Various storage and display devices
- Various transducers and the data acquisition systems

UNIT I   INTRODUCTION   9

Functional elements of an instrument – Static and dynamic characteristics — Errors in measurement – Statistical evaluation of measurement data – Standards and calibration- Principle and types of analog and digital voltmeters, ammeters.

UNIT II   ELECTRICAL AND ELECTRONIC INSTRUMENTS   9

Principle and types of multi meters – Single and three phase watt meters and energy meters –Magnetic measurements – Determination of B-H curve and measurements of iron loss – Instrument transformers – Instruments for measurement of frequency and phase.

UNIT III   COMPARATIVE METHODS OF MEASUREMENTS   9

D.C potentiometers, D.C (Wheat stone, Kelvin and Kelvin Double bridge) & A.C bridges (Maxwell, Anderson and Schering bridges), transformer ratio bridges, self-balancing bridges. Interference & screening — Multiple earth and earth loops - Electrostatic and electromagneticInterference — Grounding techniques.

UNIT IV   STORAGE AND DISPLAY DEVICES   9

Magnetic disk and tape — Recorders, digital plotters and printers, CRT display, digital CRO, LED, LCD & Dot matrix display — Data Loggers.

UNIT V   TRANSDUCERS AND DATA ACQUISITION SYSTEMS   9

Classification of transducers – Selection of transducers – Resistive, capacitive & inductive Transducers – Piezoelectric, Hall effect, optical and digital transducers – Elements of data acquisition system — Smart sensors-Thermal Imagers.

TOTAL :   45   PERIODS

OUTCOMES:

- To acquire knowledge on Basic functional elements of instrumentation
- To understand the concepts of Fundamentals of electrical and electronic instruments
- Ability to compare between various measurement techniques
- To acquire knowledge on Various storage and display devices
- To understand the concepts Various transducers and the data acquisition systems
- Ability to model and analyze electrical and electronic Instruments and understand theoperational features of display Devices and Data Acquisition System.

TEXT BOOKS:

1. A.K. Sawhney, 'A Course in Electrical & Electronic Measurements & Instrumentation',Dhanpat Rai and Co, 2010.
2. J. B. Gupta, 'A Course in Electronic and Electrical Measurements', S. K. Kataria & Sons,Delhi, 2013.
3. Doebelin E.O. and Manik D.N., Measurement Systems – Applications and Design, SpecialIndian Edition, McGraw Hill Education Pvt. Ltd., 2007.

REFERENCES

1. H.S. Kalsi, 'Electronic Instrumentation', McGraw Hill, III Edition 2010.
2. D.V.S. Murthy, 'Transducers and Instrumentation', Prentice Hall of India Pvt Ltd, 2015.
3. David Bell, ' Electronic Instrumentation & Measurements', Oxford University Press,2013.
4. Martin Reissland, 'Electrical Measurements', New Age International (P) Ltd., Delhi, 2001.
5. Alan. S. Morris, Principles of Measurements and Instrumentation, 2nd Edition, Prentice Hallof India, 2003.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EE8501   **POWER SYSTEM ANALYSIS**   L   T   P   C
                                                                          3   0   0   3

OBJECTIVES:
- To model the power system under steady state operating condition
- To understand and apply iterative techniques for power flow analysis
- To model and carry out short circuit studies on power system
- To model and analyze stability problems in power system

UNIT I   POWER SYSTEM   9
Need for system planning and operational studies - Power scenario in India - Power system components — Representation -
Single line diagram - per unit quantities - p.u. impedance diagram - p.u. reactance diagram - Network graph, Bus incidence
matrix, Primitive parameters, Bus admittance matrix from primitive parameters - Representation of off- nominal
transformer - Formation of bus admittance matrix of large power network.

UNIT II   POWER FLOW ANALYSIS   9
Bus classification - Formulation of Power Flow problem in polar coordinates - Power flow solution using Gauss Seidel
method - Handling of Voltage controlled buses - Power Flow Solution by Newton Raphson method.

UNIT III   SYMMETRICAL FAULT ANALYSIS   9
Assumptions in short circuit analysis - Symmetrical short circuit analysis using Thevenin's theorem - Bus Impedance matrix
building algorithm (without mutual coupling) - Symmetrical fault analysis through bus impedance matrix - Post fault bus
voltages - Fault level - Current limiting reactors.

UNIT IV   UNSYMMETRICAL FAULT ANALYSIS   9
Symmetrical components - Sequence impedances - Sequence networks - Analysis of unsymmetrical faults at generator
terminals: LG, LL and LLG - unsymmetrical fault occurring at any point in a power system - computation of post fault
currents in symmetrical component and phasor domains.

UNIT V   STABILITY ANALYSIS   9
Classification of power system stability — Rotor angle stability - Swing equation - Swing curve - Power-Angle
equation - Equal area criterion - Critical clearing angle and time - Classical step-by-step solution of the swing equation
— modified Euler method.

                                        TOTAL :   45   PERIODS
OUTCOMES:
- Ability to model the power system under steady state operating condition
- Ability to understand and apply iterative techniques for power flow analysis
- Ability to model and carry out short circuit studies on power system
- Ability to model and analyze stability problems in power system

- Ability to acquire knowledge on Fault analysis.
- Ability to model and understand various power system components and carry outpower flow, short circuit
  and stability studies.

TEXT BOOKS:
1.   John J. Grainger, William D. Stevenson, Jr, 'Power System Analysis', Mc Graw HillEducation (India) Private
      Limited, New Delhi, 2015.
2.   Kothari D.P. and Nagrath I.J., 'Power System Engineering', Tata McGraw-HillEducation, Second Edition,
      2008.
3.   Hadi Saadat, 'Power System Analysis', Tata McGraw Hill Education Pvt. Ltd., NewDelhi, 21st reprint, 2010.

REFERENCES
1.   Pai M A, 'Computer Techniques in Power System Analysis', Tata Mc Graw-HillPublishing Company Ltd., New
      Delhi, Second Edition, 2007.
2.   J. Duncan Glover, Mulukutla S.Sarma, Thomas J. Overbye, 'Power System Analysis& Design', Cengage
      Learning, Fifth Edition, 2012.
3.   Gupta B.R., 'Power System - Analysis and Design', S. Chand Publishing, 2001.
4.   Kundur P., 'Power System Stability and Control', Tata McGraw Hill Education Pvt.Ltd., New Delhi, 10th
      reprint, 2010

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EE8403	MEASUREMENTS AND INSTRUMENTATION	L	T	P	C
		3	0	0	3

OBJECTIVES:
To impart knowledge on the following Topics

- Basic functional elements of instrumentation
- Fundamentals of electrical and electronic instruments
- Comparison between various measurement techniques
- Various storage and display devices
- Various transducers and the data acquisition systems

UNIT I   INTRODUCTION   9
Functional elements of an instrument – Static and dynamic characteristics – Errors in measurement – Statistical evaluation of measurement data – Standards and calibration- Principle and types of analog and digital voltmeters, ammeters.

UNIT II   ELECTRICAL AND ELECTRONIC INSTRUMENTS   9
Principle and types of multi meters – Single and three phase watt meters and energy meters – Magnetic measurements – Determination of B-H curve and measurements of iron loss – Instrument transformers – Instruments for measurement of frequency and phase.

UNIT III   COMPARATIVE METHODS OF MEASUREMENTS   9
D.C potentiometers, D.C (Wheat stone, Kelvin and Kelvin Double bridge) & A.C bridges (Maxwell, Anderson and Schering bridges), transformer ratio bridges, self-balancing bridges. Interference & screening — Multiple earth and earth loops - Electrostatic and electromagneticInterference — Grounding techniques.

UNIT IV   STORAGE AND DISPLAY DEVICES   9
Magnetic disk and tape — Recorders, digital plotters and printers, CRT display, digital CRO, LED, LCD & Dot matrix display — Data Loggers.

UNIT V   TRANSDUCERS AND DATA ACQUISITION SYSTEMS   9
Classification of transducers – Selection of transducers – Resistive, capacitive & inductive Transducers – Piezoelectric, Hall effect, optical and digital transducers – Elements of data acquisition system — Smart sensors-Thermal Imagers.

                                                   TOTAL :   45   PERIODS

OUTCOMES:
- To acquire knowledge on Basic functional elements of instrumentation
- To understand the concepts of Fundamentals of electrical and electronic instruments
- Ability to compare between various measurement techniques
- To acquire knowledge on Various storage and display devices
- To understand the concepts Various transducers and the data acquisition systems
- Ability to model and analyze electrical and electronic Instruments and understand theoperational features of display Devices and Data Acquisition System.

TEXT BOOKS:
1. A.K. Sawhney, 'A Course in Electrical & Electronic Measurements & Instrumentation',Dhanpat Rai and Co, 2010.
2. J. B. Gupta, 'A Course in Electronic and Electrical Measurements', S. K. Kataria & Sons,Delhi, 2013.
3. Doebelin E.O. and Manik D.N., Measurement Systems – Applications and Design, SpecialIndian Edition, McGraw Hill Education Pvt. Ltd., 2007.

REFERENCES
1. H.S. Kalsi, 'Electronic Instrumentation', McGraw Hill, III Edition 2010.
2. D.V.S. Murthy, 'Transducers and Instrumentation', Prentice Hall of India Pvt Ltd, 2015.
3. David Bell, ' Electronic Instrumentation & Measurements', Oxford University Press,2013.
4. Martin Reissland, 'Electrical Measurements', New Age International (P) Ltd., Delhi, 2001.
5. Alan. S. Morris, Principles of Measurements and Instrumentation, 2nd Edition, Prentice Hallof India, 2003.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EE8601	SOLID STATE DRIVES	L	T	P	C
		3	0	0	3

OBJECTIVES:

To impart knowledge on the following Topics

- Steady state operation and transient dynamics of a motor load system.
- Analyze the operation of the converter/chopper fed dc drive, both qualitatively and quantitatively.
- Operation and performance of AC motor drives.
- Analyze and design the current and speed controllers for a closed loop solid state DC motordrive.

UNIT I   DRIVE CHARACTERISTICS   9

Electric drive – Equations governing motor load dynamics – steady state stability – multi quadrant Dynamics: acceleration, deceleration, starting & stopping – typical load torque characteristics – Selection of motor.

UNIT II   CONVERTER / CHOPPER FED DC MOTOR DRIVE   9

Steady state analysis of the single and three phase converter fed separately excited DC motor drive–continuous conduction – Time ratio and current limit control – 4 quadrant operation of converter / chopper fed drive-Applications.

UNIT III   INDUCTION MOTOR DRIVES   9

Stator voltage control–V/f control– Rotor Resistance control-qualitative treatment of slip powerrecovery drives-closed loop control— vector control- Applications.

UNIT IV   SYNCHRONOUS MOTOR DRIVES   9

V/f control and self-control of synchronous motor: Margin angle control and power factor control-Three phase voltage/current source fed synchronous motor- Applications.

UNIT V   DESIGN OF CONTROLLERS FOR DRIVES   9

Transfer function for DC motor / load and converter – closed loop control with Current and speedfeedback–armature voltage control and field weakening mode – Design of controllers; current controller and speed controller- converter selection and characteristics.

TOTAL :   45   PERIODS

OUTCOMES:

- Ability to understand and suggest a converter for solid state drive.
- Ability to select suitability drive for the given application.
- Ability to study about the steady state operation and transient dynamics of a motor loadsystem.
- Ability to analyze the operation of the converter/chopper fed dc drive.
- Ability to analyze the operation and performance of AC motor drives.
- Ability to analyze and design the current and speed controllers for a closed loop solid stateDC motor drive.

TEXT BOOKS:

1. Gopal K.Dubey, Fundamentals of Electrical Drives, Narosa Publishing House, 1992.
2. Bimal K.Bose. Modern Power Electronics and AC Drives, Pearson Education, 2002.
3. R.Krishnan, Electric Motor & Drives: Modeling, Analysis and Control, Pearson, 2001.

REFERENCES

1. Vedam Subramanyam, " Electric Drives Concepts and Applications ", 2e, McGraw Hill, 2016
2. Shaahin Felizadeh, "Electric Machines and Drives", CRC Press (Taylor and Francis Group),2013.
3. John Hindmarsh and Alasdain Renfrew, "Electrical Machines and Drives System," Elsevier2012.
4. Theodore Wildi, " Electrical Machines ,Drives and power systems ,6th edition, PearsonEducation ,2015
5. N.K. De., P.K. SEN" Electric drives" PHI, 2012.

		L	T	P	C
EE8602	**PROTECTION AND SWITCHGEAR**	3	0	0	3

OBJECTIVES:
To impart knowledge on the following Topics

- Causes of abnormal operating conditions (faults, lightning and switching surges) of theapparatus and system.
- Characteristics and functions of relays and protection schemes.
- Apparatus protection, static and numerical relays
- Functioning of circuit breaker

UNIT I   PROTECTION SCHEMES   9
Principles and need for protective schemes – nature and causes of faults – types of faults – Methodsof Grounding - Zones of protection and essential qualities of protection – Protection scheme

UNIT II   ELECTROMAGNETIC RELAYS   9
Operating principles of relays - the Universal relay – Torque equation – R-X diagram – Electromagnetic Relays – Over current, Directional, Distance, Differential, Negative sequence and Under frequency relays.

UNIT III   APPARATUS PROTECTION   9
Current transformers and Potential transformers and their applications in protection schemes - Protection of transformer, generator, motor, bus bars and transmission line.

UNIT IV   STATIC RELAYS AND NUMERICAL PROTECTION   9
Static relays – Phase, Amplitude Comparators – Synthesis of various relays using Static comparators – Block diagram of Numerical relays – Over current protection, transformer differential protection, distant protection of transmission lines.

UNIT V   CIRCUIT BREAKERS   9
Physics of arcing phenomenon and arc interruption - DC and AC circuit breaking – re-striking voltage and recovery voltage - rate of rise of recovery voltage - resistance switching - current chopping - interruption of capacitive current - Types of circuit breakers – air blast, air break, oil, SF6, MCBs, MCCBs and vacuum circuit breakers – comparison of different circuit breakers – Rating and selection of Circuit breakers.

TOTAL : 45 PERIODS

OUTCOMES:
- Ability to understand and analyze Electromagnetic and Static Relays.
- Ability to suggest suitability circuit breaker.
- Ability to find the causes of abnormal operating conditions of the apparatus and system.
- Ability to analyze the characteristics and functions of relays and protection schemes.
- Ability to study about the apparatus protection, static and numerical relays.
- Ability to acquire knowledge on functioning of circuit breaker.

TEXT BOOKS:
1. Sunil S.Rao, 'Switchgear and Protection', Khanna Publishers, New Delhi, 2008.
2. B.Rabindranath and N.Chander, 'Power System Protection and Switchgear', New AgeInternational (P) Ltd., First Edition 2011.
3. Arun Ingole, 'Switch Gear and Protection' Pearson Education, 2017.

REFERENCES
1. BadriRam ,B.H. Vishwakarma, 'Power System Protection and Switchgear', New AgeInternationalPvt Ltd Publishers, Second Edition 2011.
2. Y.G.Paithankar and S.R.Bhide, 'Fundamentals of power system protection', SecondEdition,Prentice Hall of India Pvt. Ltd., New Delhi, 2010.
3. C.L.Wadhwa, 'Electrical Power Systems', 6th Edition, New Age International (P) Ltd., 2010
4. RavindraP.Singh, 'Switchgear and Power System Protection', PHI Learning Private Ltd.,NewDelhi, 2009.
5. VK Metha," Principles of Power Systems" S. Chand, 2005.
6. Bhavesh Bhalja, R.P. Maheshwari, Nilesh G. Chotani,'Protection and Switchgear' OxfordUniversity Press, 2011.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

OBJECTIVES:
To impart knowledge on the following Topics

- Building Blocks of Embedded System
- Various Embedded Development Strategies
- Bus Communication in processors, Input/output interfacing.
- Various processor scheduling algorithms.
- Basics of Real time operating system and example tutorials to discuss on one real timeoperating system tool.

UNIT I   INTRODUCTION TO EMBEDDED SYSTEMS   9
Introduction to Embedded Systems –Structural units in Embedded processor , selection of processor & memory devices- DMA — Memory management methods- Timer and Counting devices, Watchdog Timer, Real Time Clock, In circuit emulator, Target Hardware Debugging.

UNIT II   EMBEDDED NETWORKING   9
Embedded Networking: Introduction, I/O Device Ports & Buses– Serial Bus communication protocols RS232 standard – RS422 – RS 485 - CAN Bus -Serial Peripheral Interface (SPI) – InterIntegrated Circuits (I^2C) –need for device drivers.

UNIT III   EMBEDDED FIRMWARE DEVELOPMENT ENVIRONMENT   9
Embedded Product Development Life Cycle- objectives, different phases of EDLC, Modelling of EDLC; issues in Hardware-software Co-design, Data Flow Graph, state machine model,

Sequential Program Model, concurrent Model, object oriented Model.

UNIT IV   RTOS BASED EMBEDDED SYSTEM DESIGN   9
Introduction to basic concepts of RTOS- Task, process & threads, interrupt routines in RTOS, Multiprocessing and Multitasking, Preemptive and non-preemptive scheduling, Task communication shared memory, message passing-, Inter process Communication — synchronization between processes-semaphores, Mailbox, pipes, priority inversion, priorityinheritance.

UNIT V   EMBEDDED SYSTEM APPLICATION AND DEVELOPMENT   9
Case Study of Washing Machine- Automotive Application- Smart card System Application-ATM machine –Digital camera

                                                         TOTAL :   45   PERIODS

OUTCOMES:
- Ability to understand and analyze Embedded systems.
- Ability to suggest an embedded system for a given application.
- Ability to operate various Embedded Development Strategies
- Ability to study about the bus Communication in processors.
- Ability to acquire knowledge on various processor scheduling algorithms.
- Ability to understand basics of Real time operating system.

TEXT BOOKS:
1. Peckol, "Embedded system Design", John Wiley & Sons,2010
2. Lyla B Das," Embedded Systems-An Integrated Approach", Pearson, 2013
3. Shibu. K.V, "Introduction to Embedded Systems", 2e, Mc graw Hill, 2017.

REFERENCES
1. Raj Kamal, 'Embedded System-Architecture, Programming, Design', Mc Graw Hill, 2013.
2. C.R.Sarma, "Embedded Systems Engineering", University Press (India) Pvt. Ltd, 2013.
3. Tammy Noergaard, "Embedded Systems Architecture", Elsevier, 2006.
4. Han-Way Huang, "Embedded system Design Using C8051", Cengage Learning, 2009.
5. Rajib Mall "Real-Time systems Theory and Practice" Pearson Education, 2007.

EE8006

<div align="center">

POWER QUALITY

</div>

	L	T	P	C
	3	0	0	3

OBJECTIVES: To impart knowledge about the following topics:

- Causes & Mitigation techniques of various PQ events.
- Various Active & Passive power filters.

UNIT I INTRODUCTION TO POWER QUALITY 9

Terms and definitions & Sources – Overloading, under voltage, over voltage - Concepts oftransients - Short duration variations such as interruption - Long duration variation such as sustained interruption - Sags and swells - Voltage sag - Voltage swell - Voltage imbalance – Voltage fluctuations - Power frequency variations - International standards of power quality– Computer Business Equipment Manufacturers Associations (CBEMA) curve

UNIT II VOLTAGE SAG AND SWELL 9

Estimating voltage sag performance - Thevenin's equivalent source - Analysis and calculation of various faulted condition - Estimation of the sag severity - Mitigation of voltage sag, Static transfer switches and fast transfer switches. - Capacitor switching — Lightning - Ferro resonance - Mitigation of voltage swell.

UNIT III HARMONICS 9

Harmonic sources from commercial and industrial loads - Locating harmonic sources — Power system response characteristics - Harmonics Vs transients. Effect of harmonics —Harmonic distortion - Voltage and current distortions - Harmonic indices - Inter harmonics – Resonance Harmonic distortion evaluation, IEEE and IEC standards.

UNIT IV PASSIVE POWER COMPENSATORS 9

Principle of Operation of Passive Shunt and Series Compensators, Analysis and Design of Passive Shunt Compensators Simulation and Performance of Passive Power Filters- Limitations of Passive Filters Parallel Resonance of Passive Filters with the Supply Systemand Its Mitigation. Fundamentals of load compensation – voltage regulation & power factor correction.

UNIT V POWER QUALITY MONITORING & CUSTOM POWER DEVICES 9

Monitoring considerations - Monitoring and diagnostic techniques for various power quality problems - Quality measurement equipment - Harmonic / spectrum analyzer - Flicker meters Disturbance analyzer - Applications of expert systems for power quality monitoring. Principle& Working of DSTATCOM – DSTATCOM in Voltage control mode, current control mode, DVR Structure — Rectifier supported DVR — DC Capacitor supported DVR -Unifiedpower quality conditioner.

<div align="right">

TOTAL : 45 PERIODS

</div>

OUTCOMES:

- Ability to understand various sources, causes and effects of power quality issues,electrical systems and their measures and mitigation.
- Ability to analyze the causes & Mitigation techniques of various PQ events.
- Ability to study about the various Active & Passive power filters.
- Ability to understand the concepts about Voltage and current distortions, harmonics.
- Ability to analyze and design the passive filters.
- Ability to acquire knowledge on compensation techniques.
- Ability to acquire knowledge on DVR.

TEXT BOOKS:

1. Roger. C. Dugan, Mark. F. Mc Granagham, Surya Santoso, H.WayneBeaty,"Electrical Power Systems Quality", McGraw Hill,2003

2. J. Arrillaga, N.R. Watson, S. Chen, "Power System Quality Assessment", (New York :Wiley),2000.

3. Bhim Singh, Ambrish Chandra, Kamal Al-Haddad," Power Quality Problems &Mitigation Techniques" Wiley, 2015.

REFERENCES

1. G.T. Heydt, "Electric Power Quality", 2nd Edition. (West Lafayette, IN, Stars in aCircle Publications, 1994.

2. M.H.J Bollen, "Understanding Power Quality Problems: Voltage Sags and Interruptions", (New York: IEEE Press), 2000.

Dr.R.GURUMANI, M.E., Ph.D., M.B.A., M.ISTE., F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

SPECIAL ELECTRICAL MACHINES   LT P C
                                                                                                        3 0 0 3

OBJECTIVES:

- To impart knowledge on Construction, principle of operation and performance of synchronousreluctance motors.
- To impart knowledge on the Construction, principle of operation, control and performance ofstepping motors.
- To impart knowledge on the Construction, principle of operation, control and performance ofswitched reluctance motors.
- To impart knowledge on the Construction, principle of operation, control and performance of permanent magnet brushless D.C. motors.
- To impart knowledge on the Construction, principle of operation and performance ofpermanent magnet synchronous motors.

UNIT I   SYNCHRONOUS RELUCTANCE MOTORS   9

Constructional features – Types – Axial and Radial flux motors – Operating principles – Variable Reluctance Motors – Voltage and Torque Equations - Phasor diagram - performance characteristics – Applications.

UNIT II   STEPPER MOTORS   9

Constructional features – Principle of operation – Variable reluctance motor – Hybrid motor – Single and multi stack configurations – Torque equations – Modes of excitation – Characteristics – Drivecircuits – Microprocessor control of stepper motors – Closed loop control-Concept of lead angle– Applications.

UNIT III   SWITCHED RELUCTANCE MOTORS (SRM)   9

Constructional features — Rotary and Linear SRM - Principle of operation — Torque production — Steady state performance prediction- Analytical method -Power Converters and their controllers – Methods of Rotor position sensing – Sensor less operation – Characteristics and Closed loop control - Applications.

UNIT IV   PERMANENT MAGNET BRUSHLESS D.C. MOTORS   9

Permanent Magnet materials – Minor hysteresis loop and recoil line-Magnetic Characteristics – Permeance coefficient -Principle of operation – Types – Magnetic circuit analysis – EMF and torqueequations –Commutation - Power Converter Circuits and their controllers – Motor characteristics andcontrol– Applications.

UNIT V   PERMANENT MAGNET SYNCHRONOUS MOTORS (PMSM)   9

Principle of operation – Ideal PMSM – EMF and Torque equations – Armature MMF – Synchronous Reactance – Sine wave motor with practical windings - Phasor diagram – Torque/speed characteristics - Power controllers - Converter Volt-ampere requirements– Applications.

TOTAL : 45 PERIODS

OUTCOMES:

- Ability to model and analyze electrical apparatus and their application to power system

TEXT BOOKS:

1. K.Venkataratnam, ‚Special Electrical Machines‘, Universities Press (India) Private Limited, 2008.

2. T.J.E. Miller, ‚Brushless Permanent Magnet and Reluctance Motor Drives‘, Clarendon Press, Oxford, 1989.

3. T. Kenjo, ‚Stepping Motors and Their Microprocessor Controls‘, Clarendon Press London, 1984.

REFERENCES:

1. R.Krishnan, ‚Switched Reluctance Motor Drives — Modeling, Simulation, Analysis, Design and Application‘, CRC Press, New York, 2001.

2. P.P. Aearnley, ‚Stepping Motors — A Guide to Motor Theory and Practice‘, Peter Perengrinus London, 1982.

3. T. Kenjo and S. Nagamori, ‚Permanent Magnet and Brushless DC Motors‘, Clarendon Press, London, 1988.

4. E.G. Janardanan, ‚Special electrical machines‘, PHI learning Private Limited, Delhi, 2014.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

OBJECTIVES:

- To analyze the various concepts behind renewable energy resources.
- To introduce the energy saving concept by different ways of illumination.
- To understand the different methods of electric heating and electric welding.
- To introduce knowledge on Solar Radiation and Solar Energy Collectors
- To introduce concepts of Wind Energy and its utilization

UNIT I   ELECTRIC DRIVES AND TRACTION   9

Fundamentals of electric drive - choice of an electric motor - application of motors for particular services - traction motors - characteristic features of traction motor - systems of railway electrification - electric braking - train movement and energy consumption - traction motor control - track equipment and collection gear.

UNIT II   ILLUMINATION   9

Introduction - definition and meaning of terms used in illumination engineering - classification of light sources - incandescent lamps, sodium vapour lamps, mercury vapour lamps, fluorescent lamps — design of illumination systems - indoor lighting schemes - factory lighting halls - outdoor lighting schemes - flood lighting - street lighting - energy saving lamps, LED.

UNIT III   HEATING AND WELDING   9

Introduction - advantages of electric heating — modes of heat transfer - methods of electric heating - resistance heating - arc furnaces - induction heating - dielectric heating - electric welding — types - resistance welding - arc welding - power supply for arc welding - radiation welding.

UNIT IV   SOLAR RADIATION AND SOLAR ENERGY COLLECTORS   9

Introduction - solar constant - solar radiation at the Earth's surface - solar radiation geometry — estimation of average solar radiation - physical principles of the conversion of solar radiation into heat - flat-plate collectors - transmissivity of cover system - energy balance equation and collector efficiency - concentrating collector - advantages and disadvantages of concentrating collectors - performance analysis of a cylindrical - parabolic concentrating collector — Feedin Invertors.

UNIT V   WIND ENERGY   9

Introduction - basic principles of wind energy conversion - site selection considerations - basic components of a WECS (Wind Energy Conversion System) - Classification of WECS - types of wind Turbines - analysis of aerodynamic forces acting on the blade - performances of wind.

TOTAL : 45 PERIODS

OUTCOMES:

- Ability to understand and analyze power system operation, stability, control and protection.
- Ability to handle the engineering aspects of electrical energy generation and utilization.

TEXT BOOKS:

1. N.V. Suryanarayana, —Utilisation of Electric Power‖, Wiley Eastern Limited, New AgeInternational Limited,1993.

2. J.B.Gupta, —Utilisation Electric power and Electric Traction‖, S.K.Kataria and Sons, 2000.

3. G.D.Rai, —Non-Conventional Energy Sources‖, Khanna Publications Ltd., New Delhi, 1997.

REFERENCES:

1. R.K.Rajput, Utilisation of Electric Power, Laxmi publications Private Limited.,2007.

2. H.Partab, Art and Science of Utilisation of Electrical Energy‖, Dhanpat Rai and Co., NewDelhi, 2004.

3. C.L.Wadhwa, —Generation, Distribution and Utilisation of Electrical Energy‖, New AgeInternational Pvt.Ltd., 2003.

4. S. Sivanagaraju, M. Balasubba Reddy, D. Srilatha,' Generation and Utilization of ElectricalEnergy', Pearson Education, 2010.

5. Donals L. Steeby,' Alternative Energy Sources and Systems', Cengage Learning, 2012.

EE6010   **HIGH VOLTAGE DIRECT CURRENT TRANSMISSION**   LT P C
3 0 0 3

OBJECTIVES:
- To understand the concept, planning of DC power transmission and comparison with AC Power transmission.
- To analyze HVDC converters.
- To study about the HVDC system control.
- To analyze harmonics and design of filters.
- To model and analysis the DC system under study state.

UNIT I   INTRODUCTION   9
DC Power transmission technology – Comparison of AC and DC transmission – Application of DC transmission – Description of DC transmission system – Planning for HVDC transmission – Modern trends in HVDC technology – DC breakers – Operating problems – HVDC transmission based on VSC – Types and applications of MTDC systems.

UNIT II   ANALYSIS OF HVDC CONVERTERS   9
Line commutated converter - Analysis of Graetz circuit with and without overlap - Pulse number – Choice of converter configuration — Converter bridge characteristics — Analysis of a 12 pulse converters – Analysis of VSC topologies and firing schemes.

UNIT III   CONVERTER AND HVDC SYSTEM CONTROL   9
Principles of DC link control – Converter control characteristics – System control hierarchy – Firing angle control – Current and extinction angle control – Starting and stopping of DC link – Power control – Higher level controllers – Control of VSC based HVDC link.

UNIT IV   REACTIVE POWER AND HARMONICS CONTROL   9
Reactive power requirements in steady state – Sources of reactive power – SVC and STATCOM – Generation of harmonics – Design of AC and DC filters – Active filters.

UNIT V   POWER FLOW ANALYSIS IN AC/DC SYSTEMS   9
Per unit system for DC quantities – DC system model – Inclusion of constraints – Power flow analysis - case study.

TOTAL: 45 PERIODS

OUTCOMES:
- Ability to understand and analyze power system operation, stability, control and protection.

TEXT BOOKS:
1. Padiyar, K. R., ―HVDC power transmission system‖, New Age International (P) Ltd., New Delhi, Second Edition, 2010.
2. Edward Wilson Kimbark, ―Direct Current Transmission‖, Vol. I, Wiley interscience, New York, London, Sydney, 1971.
3. Rakosh Das Begamudre, ―Extra High Voltage AC Transmission Engineering‖, New Age
   International (P) Ltd., New Delhi, 1990.

REFERENCES:
1. Kundur P., ―Power System Stability and Control‖, McGraw-Hill, 1993.
2. Colin Adamson and Hingorani N G, ―High Voltage Direct Current Power Transmission‖, Garraway Limited, London, 1960.
3. Arrillaga, J., ―High Voltage Direct Current Transmission‖, Peter Pregrinus, London, 1983.
4. S. Kamakshaiah, V. Kamaraju, ‚HVDC Transmission‘, Tata McGraw Hill Education Private Limited, 2011.

PRINCIPAL
idhaya Engineering College for Wom~
Nainarpalaym Road, CHINNASALEM-00621,
Kallakurichi Taluk, Villupuram District
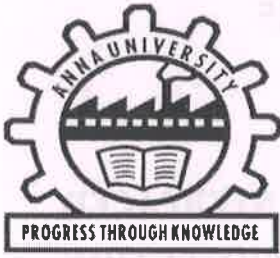
IMPACT OF INVERTER-INTERFACED RENEWABLE ENERGY GENERATORS ON DISTANCE PROTECTION AND AN IMPROVED SCHEME

A PROJECT REPORT

Submitted by

A.KALAIVANI	621116105009
B.LAVANYA	621116105012
T.PERIYANAYAKI	621116105015
M.K.SHALINI	621116105019

In partial fulfilment for the award of the degree

Of

BACHELOR OF ENGINEERING

IN

ELECTRICAL AND ELECTRONICS ENGINEERING
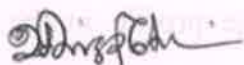
IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM-606201

ANNA UNIVERSITY: CHENNAI 600 025

APRIL 2020

1

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report **"IMPACT OF INVERTER INTERFACED RENEWABLE ENERGY GENERATORS ON DISTANCE PROTECTION AND AN IMPROVED SCHEMES"** is the bonafide work of "**KALAIVANI.A, LAVANYA.B, PERIYANAYAKI.T, SHALINI.M.K**" who carried out the project work under my supervision.

SIGNATURE

Mr.V.KARTHICKEYAN., M.E., MISTE.,

HEAD OF THE DEPARTMENT

Department of EEE,

Idhaya Engineering College For

Women, Chinnasalem-606 201

SIGNATURE

Mr.S.SILAMBARASAN.,M.E.,

SUPERVISOR

Assistant Professor/EEE,
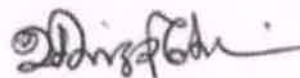
Idhaya Engineering College For

Women, Chinnasalem-606 201

Submitted for the University Examination Held On 23.09.2020 ------------------

INTERNAL EXAMINER

EXTERNAL EXAMINER

2

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

With different structures and control strategies, inverter-interfaced renewable energy generators (IIREGs) have different fault characteristics from synchronous generators. This makes the conventional distance protection used in networks with synchronous generators not applicable for transmission lines emanating from IIREGs. Therefore, supported by the fault current analysis, operating performances of distance relays on both sides of the transmission line are unveiled. It reveals the problem that the conventional distance relay on the IIREG side has a high risk of malfunction or refusing to operate. To cope with this adaptability problem, an improved scheme based on time delay and zero-sequence impedance is proposed. To validate the operating performances of the scheme, a detailed IIREG model is built in Real Time Digital Simulator (RTDS) and simulation tests are carried out. Apart from these, a field short-circuit test is performed in a real wind power plant to examine the practical feasibility of the proposed scheme. Both the simulation results and the field test confirm the problem of the conventional distance protection and verify the reliability of the improved scheme.

Index Terms—Distance protection, fault current analysis, inverter-interfaced renewable power generator, outgoing transmission line, relay scheme.

4

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

DESIGN AND DEVELOPMENT OF PV-WIND HYBRID GRID CONNECTED SYSTEM

A PROJECT REPORT

Submitted by

ANBUMAYIL A	621116105002
MANGAIYARKARASI S	621116105013
NARMATHA K	621116105014
THEERTHANA K	621116105023

in partial fulfillment for the award of the degree

Of

BACHELOR OF ENGINEERING

in

ELECTRICAL AND ELECTRONICS ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM-606201

ANNA UNIVERSITY: CHENNAI 600 025

APRIL 2020

1

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report titled "**DESIGN AND DEVELOPMENT OF PV-WIND HYBRID GRID CONNECTED SYSTEM**" is the bonafide work of " **Anbumayil A, Mangaiyarkarasi S, Narmatha K,** and **Theerthana K"** who carried out the project work under my supervision.

[signature]

SIGNATURE

Er.V.KARTHIKEYAN.,M.E.,MISTE.,

HEAD OF THE DEPARTMENT

Department of EEE,
Idhaya Engineering College
For Women,
Chinnasalem-606 201
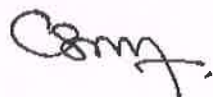
[signature]

SIGNATURE

Er.V.KARTHIKEYAN,M.E.,MISTE.,

SUPERVISOR

Department of EEE,
Idhaya Engineering College
For Women,
Chinnasalem-606 201

Submitted for the University Examination held on 23.09.2020

[signature]

INTERNAL EXAMINER

[signature]

EXTERNAL EXAMINER

2

ABSTRACT

Renewable Energy Resources are best practices possible today to stand against increasingly risk of climate changes and global warming of the world and the most important sources of such types of resources of energies can be Wind and Solar energies which are most the efficient relatively. These clean power resources are used as in Distributed Generation (DGs) units technology that are installed in distribution part of each power combined system or all the possible locations that loads and energy consumers are concentrated. Based on optimized configuration, a proposed hybrid system has developed and A proposed optimal control strategy for the minimizing grid operating cost is developed. There is a problem of maintain a constant voltage profile in the existing system. In order to overcome this problem Controller (PIC-Microcontroller) is used in the proposed system which generates PWM pulses to control the switching of the converters so that the constant voltage profile can be maintained in the grid system. In this project the existing system is overcome by connecting the control system. In this project MPPT (Maximum power point tracking)is an electronic DC to DC converter that optimizes the match between the solar array (PV panels), and the battery bank or utility grid. To put it simply, they convert a higher voltage DC output from solar panels (and a few wind generators) down to the lower voltage needed to charge batteries.

DESIGN AND IMPLEMENTATION OF HYBRID MULTILEVEL INVERTER WITH REDUCED NUMBER OF SWITCHES AND HARMONICS

A PROJECT REPORT

Submitted by

ARUNA M	621116105004
ASHWINI A	621116105005
SHAKINA K	621116105018
SINEGA R	621116105020

In partial fulfillment for the award of the degree

of

BACHELOR OFENGINEERING

in

ELECTRICAL AND ELECTRONICS ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY :CHENNAI-600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY: CHENNAI-600 025

BONAFIDE CERTIFICATE

Certifiedthat 'this project report **"DESIGN AND IMPLEMENTATIONOF HYBRID MULTILEVEL INVERTER WITH REDUCED NUMBER OF SWITCHES AND HARMONICS"** is the bonafide work of **"ARUNA.M, ASHWINI.A SHAKINA.K SINEGA.R"** who carried out the project work under my supervision.
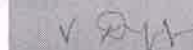
SIGNATURE

Mr.V.KARTHIKEYAN,ME, MISTE

HEAD OF THE DEPARTMENT,

Department of Electrical and Electronics Engineering

Idhaya Engineering College for Women,

Chinnasalem-606 201.

SIGNATURE

Ms.V.DEVIPRIYA,ME,

SUPERVISOR,
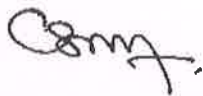
Assistant Professor

Department of Electrical and Electronics Engineering,

Idhaya Engineering College for Women,

Chinnasalem-606 201.

Submitted for the university examination held on 23.09.2020

INTERNAL EXAMINER

EXTERNAL EXAMINER

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

A hybrid multilevel inverter is proposed in this work. It consists of transistors .The four transistors form one h-bridges resulting in simple structure and easy design of gate drives. Now a days with the advancement of technology , The demand for electric power is increasing at an exponential rate. And the quality of power delivered to the end user is affected by the increasing number of nonlinear loads conducted to the power grid, such as diode and thyristor front-end rectifiers. The main affect caused by theseproblems is the presence of harmonics. One of the most important issues is related to current harmonics generated by the increasing number of nonlinear loads connected to the power grid. This leads to the overheating of the equipment, insulation failure, over speeding of induction motor, voltage distortions, additional losses in the system ,and malfunction of sensitive electronic equipment ect., harmonics restriction standards , such as IEEE519 have been recommended to limit the harmonics currents injected in to the grid by nonlinear loads etc., the solution to over comes these problems is to filter out these harmonics. For this purpose there are many filter topologies present in the literature.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANN BASED PELTIER COOLING AND AUTOMATIC PUMPING SYSTEM USING SOLAR POWER

A PROJECT REPORT

Submitted by

ABINAYA.K   621116105001

GAYATHRI.K   621116105007

SARANYA.S   621116105017

SRI SWARNA DHARSHINI.K   621116105021

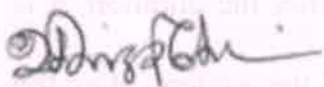*In partial fulfillment for the award of the degree*

Of

BACHELOR OF ENGINEERING

IN

ELECTRICAL AND ELECTRONICS ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM-606 201

ANNA UNIVERSITY: CHENNAI 600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report "**ANN BASED PELTIER COOLING AND AUTOMATIC PUMPING SYSTEM USING SOLAR POWER**" is the bonafide work of "**K.Abinaya, K.Gayathri, S.Saranya, K.Sri Swarna Dharshini**" who carried out the project work under my supervision.
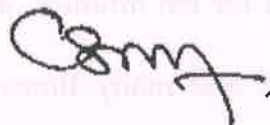
SIGNATURE

Er.V.KARTHIKEYAN.,M.E., MISTE.,

HEAD OF THE DEPARTMENT

Department of EEE,
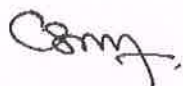
Idhaya Engineering College

For Women,

Chinnasalem-606 201.

SIGNATURE

Er.C.KUMAR.,M.E., MISTE.,
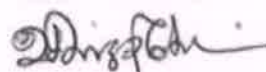
SUPERVISOR

Assistant professor,

Department of EEE,

Idhaya Engineering College

For Women,

Chinnasalem-606 201.

Submitted for the University Examination Held On————23.09.2020————

INTERNAL EXAMINER

EXTERNAL EXAMINER

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

We're using Nonrenewable sources of energy in excess mount for our needs. As this type of minerals like coal etc. are exhausting so we have to depend on the renewable sources of energy like solar, wind, etc. For smaller application it is better to use renewable energy. So for this particular application we are using solar panels to charge the DC battery and the power from the battery can be used for this application. This project is an innovative solution to operate a machine / motor / liquid pumps for a small duration. If a machine is to be operated for ten minutes, and should be switched off after the duration, it is too difficult and many times we forget to switch it off the system after the prescribed time. This project provides the facility of automatic switch off after the requited time duration. This is achieved by using the ANN controller. Four push-to-on switches are connected to one port of the ANN controller. These four switches are to provide four different fixed time constants. A LCD is connected to the ANN controller to display the status of the pump. Contrast of the LCD can adjust by using a preset which is connected to it. A transistor is used to drive the relay during the active time period. 5V double pole – double through relay is used to control the AC liquid pump. LED indication is provided for visual identification of the relay / load status. A switching diode is connected across the relay to neutralize the reverse EMF.

iii

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

DESIGN AND IMPLEMENTATION OF ANN CONTROL BASED INTERLEAVED CONVERTER

A PROJECT REPORT

Submitted by

ARUNA C   621116105003

BHARATHI K   621116105006

PRITHIYA B   621116105016

SUBASHINI V   621116105022

In partial fulfillment for the award of the degree

Of

BACHELOR OF ENGINEERING

IN

ELECTRICAL AND ELECTRONICS ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM-606 201

ANNA UNIVERSITY: CHENNAI 600 025

APRIL 2020

iii

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

BONAFIDE CERTIFICATE

certified that this project report **"DESIGN AND IMPLEMENTATIONOF ANN CONTROL SYSTEMBASEDINTERLEAVED CONVERTER"** is the bonafide work of **"ARUNA.C, BHARATHI.K, PRITHIYA.B, SUBASHINI.V,"** who carried out the project work under my supervision.

SIGNATURE

Mr. V. KARTHIKEYAN, ME, MISTE

HEAD OF THE DEPARTMENT,

Department of Electrical and Electronics

Engineering
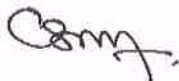
Idhaya Engineering College For Women,
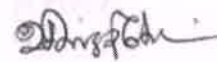
Chinnasalem - 606 201.

SIGNATURE

Ms.J.R.LYDIAJENIFER, ME,

SUPERVISOR,

Department of Electrical and   Electronics

Engineering,

Idhaya Engineering College For Women,

Chinnasalem - 606 201.

23.09.2020

Submitted for the University Examination Held On—————————

INTERNAL EXAMINER

EXTERNAL EXAMINER

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

EC8501	DIGITAL COMMUNICATION	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To know the principles of sampling & quantization
- To study the various waveform coding schemes
- To learn the various baseband transmission schemes
- To understand the various band pass signaling schemes
- To know the fundamentals of channel coding

UNIT I   INFORMATION THEORY   9

Discrete Memoryless source, Information, Entropy, Mutual Information - Discrete Memoryless channels – Binary Symmetric Channel, Channel Capacity - Hartley - Shannon law - Source codingtheorem - Shannon - Fano & Huffman codes.

UNIT II   WAVEFORM CODING & REPRESENTATION   9

Prediction filtering and DPCM - Delta Modulation - ADPCM & ADM principles-Linear Predictive Coding- Properties of Line codes- Power Spectral Density of Unipolar / Polar RZ & NRZ — Bipolar NRZ - Manchester

UNIT III   BASEBAND TRANSMISSION & RECEPTION   9

ISI – Nyquist criterion for distortion less transmission – Pulse shaping – Correlative coding - Eyepattern – Receiving Filters- Matched Filter, Correlation receiver, Adaptive Equalization

UNIT IV   DIGITAL MODULATION SCHEME   9

Geometric Representation of signals - Generation, detection, PSD & BER of Coherent BPSK, BFSK & QPSK - QAM - Carrier Synchronization - Structure of Non-coherent Receivers - Principleof DPSK.

UNIT V   ERROR CONTROL CODING   9

Channel coding theorem - Linear Block codes - Hamming codes - Cyclic codes - Convolutionalcodes - Viterbi Decoder.

TOTAL:45 PERIODS

OUTCOMES:
Upon completion of the course, the student should be able to

- Design PCM systems
- Design and implement base band transmission schemes
- Design and implement band pass signaling schemes
- Analyze the spectral characteristics of band pass signaling schemes and their noiseperformance
- Design error control coding schemes

TEXT BOOK:

1. S. Haykin, —Digital Communicationsl, John Wiley, 2005 (Unit I –V)

REFERENCES

1. B. Sklar, —Digital Communication Fundamentals and Applicationsl, 2nd Edition, PearsonEducation, 2009

2. B.P.Lathi, —Modern Digital and Analog Communication Systemsl 3rd Edition, Oxford UniversityPress 2007.

3. H P Hsu, Schaum Outline Series - —Analog and Digital Communicationsl, TMH 2006

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

BSNL

BHARAT SANCHAR NIGAM LIMITED

(A Government of India Enterprise)
CUDDALORE TELECOM DISTRICT
BSNL earning

CERTIFICATE

This is certify that Sri.G.MADHURASREE, A student of IDHAYA ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM-606201.

BE.,(ECE)- Second Year

has undergone (Vocational Training) on Telecom Technologies (Internship Training) in our organization for (30 hours) from 03.06.2019 to 07.06.2019 and completed the above training successfully.

Place: Kallakurichi
Date: 07.06.2019

I. RAJAVEL
उपमंडल अभियंता (बाहरी)
SUB DIVISIONAL ENGINEER(Exthl)
बीएसएनएल. टेलीफोन केंद्र.
BSNL,TELEPHONE EXCHANGE
कल्लकुरिचि / KALLAKURICHI 606 202

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

BSNL

BHARAT SANCHAR NIGAM LIMITED

(A Government of India Enterprise)
CUDDALORE TELECOM DISTRICT
BSNL earning

CERTIFICATE

This is certify that **Sri.S.ANJUGAM,** A student of **IDHAYA ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM-606201.**

BE.,(ECE)- Second Year

has undergone (Vocational Training) on Telecom Technologies (Internship Training) in our organization for (30 hours) from 03.06.2019 to 07.06.2019 and completed the above training successfully.

Place: Kallakurichi
Date: 07.06.2019

SUB DIVISIONAL ENGINEER
BSNL, TELEPHONE EXCHANGE
KALLAKURICHI- 606202.

उपमंडल अभियंता (आंतरिक)
SUB DIVISIONAL ENGINEER(Indoor)
बीएसएनएल, टेलीफोन केंद्र,
BSNL, TELEPHONE EXCHANGE
कल्लकुरिचि / KALLAKURICHI 606 202

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

BSNL

BHARAT SANCHAR NIGAM LIMITED

(A Government of India Enterprise)
CUDDALORE TELECOM DISTRICT
BSNL earning

CERTIFICATE

This is certify that **Sri.B.SINDHUBALA,** A student of **IDHAYA ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM-606201.**

BE.,(ECE)- Second Year

has undergone (Vocational Training) on Telecom Technologies (Internship Training) in our organization for (30 hours) from 03.06.2019 to 07.06.2019 and completed the above training successfully.

Place: Kallakurichi

Date: 07.06.2019

Assistant General Manager

(Administration)

O/o.PGM BSNL, Kallakurichi- 606202.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EC8551	COMMUNICATION NETWORKS	L	T	P	C
		3	0	0	3

OBJECTIVES:

The student should be made to:

- Understand the division of network functionalities into layers.
- Be familiar with the components required to build different types of networks
- Be exposed to the required functionality at each layer
- Learn the flow control and congestion control algorithms

UNIT I   FUNDAMENTALS & LINK LAYER   9

Overview of Data Communications- Networks — Building Network and its types- Overview of Internet - Protocol Layering - OSI Mode — Physical Layer — Overview of Data and Signals -introduction to Data Link Layer - Link layer Addressing- Error Detection and Correction

UNIT II   MEDIA ACCESS & INTERNETWORKING   9

Overview of Data link Control and Media access control - Ethernet (802.3) - Wireless LANs — Available Protocols — Bluetooth — Bluetooth Low Energy — WiFi — 6LowPAN–Zigbee - Network layer services — Packet Switching — IPV4 Address — Network layer protocols (IP, ICMP, Mobile IP)

UNIT III   ROUTING   9

Routing - Unicast Routing — Algorithms — Protocols — Multicast Routing and its basics — Overview of Intradomain and interdomain protocols — Overview of IPv6 Addressing — Transition from IPv4 to IPv6

UNIT IV   TRANSPORT LAYER   9

Introduction to Transport layer —Protocols- User Datagram Protocols (UDP) and Transmission Control Protocols (TCP) — Services — Features — TCP Connection — State Transition Diagram — Flow, Error and Congestion Control - Congestion avoidance (DECbit, RED) — QoS — Applicationrequirements

UNIT V   APPLICATION LAYER   9

Application Layer Paradigms — Client Server Programming — World Wide Web and HTTP - DNS- -Electronic Mail (SMTP, POP3, IMAP, MIME) — Introduction to Peer to Peer Networks — Need for
Cryptography and Network Security — Firewalls.

TOTAL:45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Identify the components required to build different types of networks
- Choose the required functionality at each layer for given application
- Identify solution for each functionality at each layer
- Trace the flow of information from one node to another node in the network

TEXT BOOK:

1. Behrouz A. Forouzan, —Data communication and Networkingl, Fifth Edition, Tata McGraw –Hill, 2013 (UNIT I –V)

REFERENCES

1. James F. Kurose, Keith W. Ross, —Computer Networking - A Top-Down Approach Featuring the Internetl, Seventh Edition, Pearson Education, 2016.

2. Nader. F. Mir,— Computer and Communication Networksl, Pearson Prentice HallPublishers, 2nd Edition, 2014.

3. Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, —Computer Networks: An Open SourceApproachl, Mc Graw Hill Publisher, 2011.

4. Larry L. Peterson, Bruce S. Davie, —Computer Networks: A Systems Approachl, Fifth Edition, Morgan Kaufmann Publishers, 2011.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Certificate No.: **548**

RnD

Internship Certificate

This is to certify that

Anitha.P   II year   ECE

Idhaya Engineering College for Women

has successfully completed the Internship and is awarded this certificate of

completion under the seal of this conern.

Reg No.   : 621117106004

Name of the Intern : Embedded

Period of the Intern : 7th June - 19th June, 2019

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT

Authorized Signature

<codeb!nd/>™
{Technologies}
Solution Without Compromise!

CERTIFICATE OF COMPLETION

CERTIFICATE NUMBER | CBTTIPE 0620051911203

This certificate is awarded to ___S.ANISHYA___,

who has undergone Inplant Training in ___EMBEDDED SYSTEMS___,

from ___06.12.2019___ to ___10.12.2019___ at CodeBind Technologies, Trichy.

During the course of training period, the conduct of the trainee

was found to be ___GOOD___.

Training Facilitator

Issuing Authority

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.IS
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WO
CHINNASALEM-606 201, KALLAKURI

<codeb!nd/>™
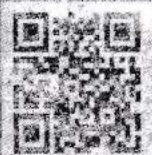## {Technologies}
Solution Without Compromise!

CERTIFICATE OF COMPLETION

CERTIFICATE NUMBER | CBT71PE06200519.12.07

This certificate is awarded to ___B.PRAVEENA___,

who has undergone Inplant Training in ___EMBEDDED SYSTEMS___,

from __06.12.2019__ to __10.12.2019__ at CodeBind Technologies, Trichy.

During the course of training period, the conduct of the trainee

was found to be __GOOD__.

Training Facilitator

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Issuing Authority

<codeb!nd/>™
{Technologies}
Solution Without Compromise!

CERTIFICATE OF COMPLETION

CERTIFICATE NUMBER | CBTTIPE 0620051911205

This certificate is awarded to ___R.SOWMIYA___,

who has undergone Inplant Training in ___EMBEDDED SYSTEMS___,

from __06.12.2019__ to __10.12.2019__ at CodeBind Technologies, Trichy.
During the course of training period, the conduct of the trainee
was found to be __GOOD__.

_S.M_
Training Facilitator

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOM
CHINNASALEM-606 201. KALLAKURICH

R.
Issuing Authority

<codeb!nd/>™
{Technologies}
Solution Without Compromise!

CERTIFICATE OF COMPLETION

CERTIFICATE NUMBER CBTTIPE 062005191201

This certificate is awarded to ___M.BHUVANESHWARI___,

who has undergone Inplant Training in ___EMBEDDED SYSTEMS___,

from ___06.12.2019___ to ___10.12.2019___ at CodeBind Technologies, Trichy.

During the course of training period, the conduct of the trainee

was found to be ___GOOD___.

Training Facilitator

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Issuing Authority

<codeb!nd/>™
{Technologies}
Solution Without Compromise!

1, Cross, Thillai Nagar, Trichy
Near Thillai Nagar 4th Cross, Bus Stop
+91-4010 &011 49 4010 5011
www.codebindtechnologies.com
info@codebindtechnologies.com

CERTIFICATE OF COMPLETION

CERTIFICATE NUMBER   CBTTIPE062005191204

This certificate is awarded to _____ V. AMIRTHA _____,

who has undergone Inplant Training in ___ EMBEDDED SYSTEMS ___,

from __06.12.2019__ to __10.12.2019__ at CodeBind Technologies, Trichy.

During the course of training period, the conduct of the trainee

was found to be ___ GOOD ___.

Training Facilitator

Dr.R.GURUMANI, M.E., Ph.D., M.B.A., M.ISTE., F.I.E.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201, KALLAKURICHI DT.

Issuing Authority

Caliber Embedded

Technologies India (P) Ltd.

Certificate of Completion

This to certify that

R. HARANISHWARI Iᵢᵢ-ECE IDHAYA ENGINEERING COLLEGE FOR WOMEN

has successfully completed the ___INPLANT TRAINING___

on ___INTERNET OF THINGS___

With Hands on Training on ___6.12.2019 & 7.12.2019___

Director

Instructor

Caliber Embedded
Technologies India (P) Ltd.

Our Clients

BOSCH
invented for life

bridgeCo

innovus

STANLEY
Security Solutions

.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT

pricol

Caliber Embedded

Technologies India (P) Ltd.

Certificate of Completion

This to certify that

T. SELVA BHARATHI III-ECE IDHAYA ENGINEERING COLLEGE FOR WOMEN

has successfully completed the INPLANT TRAINING

on INTERNET OF THINGS

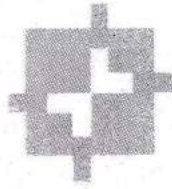*With Hands on Training on* 6.12.2019 & 7.12.2019

Director

Caliber Embedded
Technologies India (P) Ltd.

Instructor

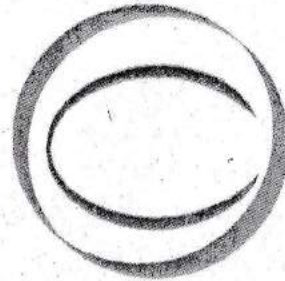Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNA... -M-606 201. KALLAKURICHI DT.

Our Clients

BOSCH
Invented for life

bridgeCo

innovus

STANLEY
Security Solutions

BERKEL
Always The Original

pricol

Certificate No.: 547

RnD

Internship Certificate

This is to certify that

SRIMATHI. M II year ECE

Idhaya Engineering College for Women

has successfully completed the Internship and is awarded this certificate of

completion under the seal of this conern.

Reg No. : 621117106028

Name of the Intern : Embedded

Period of the Intern : 7th June - 19th June, 2019

Authorized Signature

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE,FI
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM 606 201. KALLAKURICHI DT

Certificate No.: **545**

RnD
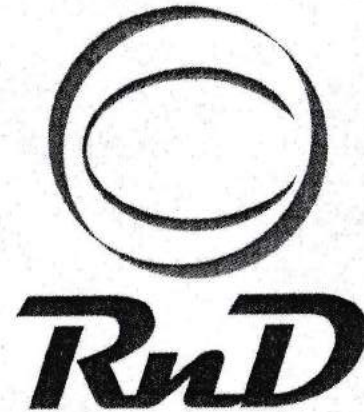
Internship Certificate

This is to certify that

MEENA.K II year ECE

Idhaya Engineering College for Women

has successfully completed the Internship and is awarded this certificate of

completion under the seal of this conern.

Reg No.   : 621117106019

Name of the Intern : Embedded

Period of the Intern : 7th June - 19th June, 2019

Authorized Signature

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
ENGG. COLLEGE FOR WOMEN
EM-606 201. KALLAKURICHI DT.

Certificate No.: **550**

RnD

Internship Certificate

This is to certify that

BHARATHI. T II year ECE

Idhaya Engineering College for Women

has successfully completed the Internship and is awarded this certificate of

completion under the seal of this conern.

Reg No.   : 6211171O6009

Name of the Intern : Embedded

Period of the Intern : 7th June - 19th June, 2019

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE,TIE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Authorized Signature

Certificate No.: **539**

RnD

Internship Certificate

This is to certify that

Rasiya . P   II year   ECE

Idhaya College of Engineering

has successfully completed the Internship and is awarded this certificate of

completion under the seal of this conern.

Reg No.   : 6211171106024

Name of the Intern : Embedded

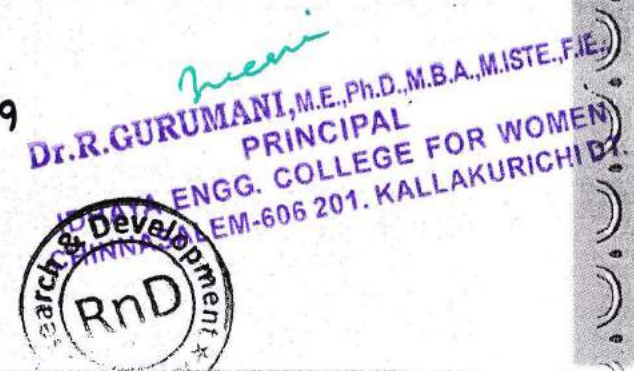Period of the Intern : 7th June - 19th June. 2019

Authorized Signature

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE,FIE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Certificate No.: 541

RnD

Internship Certificate
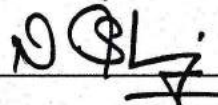
This is to certify that

SUBHASHINI. S II year ECE

Idhaya Engineering College for Women

has successfully completed the Internship and is awarded this certificate of

completion under the seal of this conern.

Reg No. : 621117106029

Name of the Intern : Embedded

Period of the Intern : 7th June - 19th June, 2019

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Authorized Signature

BE8254   **BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING**   **L T P C**
                                                                           3 0 0 3

OBJECTIVES:

To impart knowledge on

- Operation of Three phase electrical circuits and power measurement
- Working principles of Electrical Machines
- Working principle of Various measuring instruments

UNIT I   **AC CIRCUITS AND POWER SYSTEMS**   **9**

Three phase power supply – Star connection – Delta connection – Balanced and Unbalanced Loads- Power equation — Star Delta Conversion — Three Phase Power Measurement - Transmission & Distribution of electrical energy – Over head Vs Underground system – Protection of power system – types of tariff – power factor improvement

UNIT II   **TRANSFORMER**   **9**

Introduction - Ideal Transformer – Accounting For Finite Permeability And Core Loss – Circuit Model Of Transformer – Per Unit System – Determination Of Parameters Of Circuit Model Of Transformer – Voltage Regulation – Name Plate Rating – Efficiency – Three Phase Transformers -Auto Transformers

UNIT III   **DC MACHINES**   **9**

Introduction – Constructional Features– Motoring and generation principle - Emf And Torque equation – Circuit Model – Methods of Excitation and magnetisation characteristics – Starting andSpeed Control — Universal Motor

UNIT IV   **AC MACHINES**   **9**

Principle of operation of three-phase induction motors – Construction –Types – Equivalent circuit, Single phase Induction motors -Construction– Types–starting and speed control methods. Alternator- working principle–Equation of induced EMF – Voltage regulation, Synchronous motors- working principle-starting methods -– Torque equation – Stepper Motors – Brushless DC Motors

UNIT V   **MEASUREMENT AND INSTRUMENTATION**   **9**

Type of Electrical and electronic instruments — Classification- Types of indicating Instruments —Principles of Electrical Instruments –Multimeters, Oscilloscopes- Static and Dynamic Characteristics of Measurement — Errors in Measurement — Transducers - Classification of Transducers: Resistive, Inductive, Capacitive, Thermoelectric, piezoelectric, photoelectric, Hall effect and Mechanical

                                                             TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course the students will be able to

- Understand the concept of three phase power circuits and measurement.
- Comprehend the concepts in electrical generators, motors and transformers
- Choose appropriate measuring instruments for given application

TEXT BOOKS:

1. D P Kothari and I.J Nagarath, —Basic Electrical and Electronics Engineeringǁ, McGraw Hill Education(India) Private Limited, Third Reprint ,2016

2. Giorgio Rizzoni, —Principles and Applications of Electrical Engineeringǁ, McGraw Hill Education(India) Private Limited, 2010

3. S.K.Bhattacharya —Basic Electrical and Electronics Engineeringǁ, Pearson India, 2011

REFERENCES:

1. Del Toro ,ǁElectrical Engineering Fundamentalsǁ, Pearson Education, New Delhi, 2015.

2. Leonard S Bobrow, — Foundations of Electrical Engineeringǁ, Oxford University Press, 2013

3. Rajendra Prasad ,ǁFundamentals of Electrical engineeringǁ, Prentice Hall of India, 2006.

4. Mittle N., —Basic Electrical Engineeringǁ, Tata McGraw Hill Edition, 24th reprint 2016

5. A.E.Fitzgerald, David E Higginbotham and Arvin Grabel, —Basic Electrical Engineeringǁ, McGraw Hill Education(India) Private Limited, 2009

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

M Gmail

Kumar Chinnasamy <srikumareee@gmail.com>

IV-PERMISSION LETTER-IDHAYA ENGINEERING COLLEGE

Padmavahini Transformers <info@padmavahini.in>   Wed, Feb 12, 2020 at 4:46 PM
To: "c.kumar" <srikumareee@gmail.com>
Cc: stores-padmavahini <stores@padmavahinitransformers.com>

Permission granted.

For further assistance coordinate with our Mr.Ganesh Babu at 99430 46222.

With Regards,

R.Vathirajan
Managing Director
Padmavahini Transformers (P) Ltd.
(An ISO 9001 : 2015 Certified Company)
S.F.No.353/1, Door No.7/140, Ruby Matriculation School Road
Keeranatham, Saravanampatti
Coimbatore - 641 035
Tamilnadu, India
Mobile : +91 98430 41222
Website : www.padmavahini.in
      www.padmavahini.com

Skype: **Vathirajan Raghupathy**

[Quoted text hidden]

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT

IDHAYA ENGINEERING COLLEGE FOR WOMEN
CHINNASALEM – 606 201.

Department of Electrical and Electronics Engineering/ Electronics & Communication Engineering

Place: Coimbatore   Day: (One day -15.02.2020)

Industrial Visit and Educational tour Report

IECW organized a one day Industrial Visit and Educational Tour to Padmavahini Transformer Pvt. Ltd , Coimbatore for II and III year students of EEE and ECE department. The tour was organized with prior permission and guidance from Principal. This tour gave a wide expo to the students. Totally 59 Students along with 4 faculty members had joined in this grand endeavour.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT

IDHAYA ENGINEERING COLLEGE FOR WOMEN

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.
An ISO 9001 : 2015 Certified Institution
(A Unit of the Franciscan Sisters of the Immaculate Heart of Mary Society, Pondicherry)

Ref: IECW / EEE & ECE / IV / 2020

Date:.. 06.02.2020 ..

To

Padmavahini Transformers Private Limited
S. F. No. 353/1, Door No. 7/140,
Ruby Matriculation School Road,
Keeranatham, Saravanampatti,
Coimbatore, Tamil Nadu 641035

Dear Sir,

Sub: **Permission for undergoing Industrial Visit your Transformer Company – Reg.**

Our Students of Idhaya Engineering College for women studying Second and Third year B.E EEE & ECE students are interested to undergo industrial visit to your Transformer Company. We hope that this visit will boost their confidence and also enrich their subject knowledge about the transformer. So I request you to grant permission to undergo visit on 15th February 2020. I assure you that they will abide by the rules and regulations stipulated by your office.

No. of Students   : EEE- 15 + 9 = 24
                              ECE- 25 + 16 = 41

No. of Staff   : 06

Staff In charge:-
    Mr.C.Kumar, AP/EEE
    Mob: 9791719103
    Mr.M.Mahesh, AP/ECE
    Mob: 7502992396

Thank you

Yours faithfully

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201, Villupuram Dt.

EC8491	COMMUNICATION THEORY	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the concepts of various analog modulations and their spectral characteristics
- To understand the properties of random process
- To know the effect of noise on communication systems
- To study the limits set by Information Theory

UNIT I   AMPLITUDE MODULATION   9

Amplitude Modulation- DSBSC, DSBFC, SSB, VSB - Modulation index, Spectra, Power relations and Bandwidth — AM Generation — Square law and Switching modulator, DSBSC Generation —Balanced and Ring Modulator, SSB Generation — Filter, Phase Shift and Third Methods, VSB Generation – Filter Method, Hilbert Transform, Pre-envelope & complex envelope – comparison of different AM techniques, Superheterodyne Receiver

UNIT II   ANGLE MODULATION   9

Phase and frequency modulation, Narrow Band and Wide band FM — Modulation index, Spectra, Power relations and Transmission Bandwidth - FM modulation –Direct and Indirect methods, FM Demodulation — FM to AM conversion, FM Discriminator - PLL as FM Demodulator.

UNIT III   RANDOM PROCESS   9

Random variables, Random Process, Stationary Processes, Mean, Correlation & Covariance functions, Power Spectral Density, Ergodic Processes, Gaussian Process, Transmission of aRandom Process Through a LTI filter.

UNIT IV   NOISE CHARACTERIZATION   9

Noise sources – Noise figure, noise temperature and noise bandwidth – Noise in cascaded systems. Representation of Narrow band noise –In-phase and quadrature, Envelope and Phase – Noise performance analysis in AM & FM systems – Threshold effect, Pre-emphasis and de- emphasis for FM.

UNIT V   SAMPLING & QUANTIZATION   9

Low pass sampling — Aliasing- Signal Reconstruction-Quantization - Uniform & non-uniformquantization - quantization noise - Logarithmic Companding –PAM, PPM, PWM, PCM — TDM, FDM.

	TOTAL:	**45**	**PERIODS**

OUTCOMES:

At the end of the course, the student should be able to:

- Design AM communication systems
- Design Angle modulated communication systems
- Apply the concepts of Random Process to the design of Communication systems
- Analyze the noise performance of AM and FM systems
- Gain knowledge in sampling and quantization

TEXT BOOKS:

1. J.G.Proakis, M.Salehi, —Fundamentals of Communication Systems‖, Pearson Education2014. (UNIT I-IV)

2. Simon Haykin, —Communication Systems‖, 4th Edition, Wiley, 2014.(UNIT I-V)

REFERENCES:

1. B.P.Lathi, —Modern Digital and Analog Communication Systems‖, 3rd Edition, OxfordUniversity Press, 2007.

2. D.Roody, J.Coolen, —Electronic Communications, 4th edition PHI 2006

3. A.Papoulis, —Probability, Random variables and Stochastic Processes‖, McGraw Hill, 3rdedition, 1991.

4. B.Sklar, —Digital Communications Fundamentals and Applications‖, 2nd Edition PearsonEducation 2007

5. H P Hsu, Schaum Outline Series - —Analog and Digital Communications‖ TMH 2006
6. Couch.L., "Modern Communication Systems", Pearson, 2001.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

M Gmail

karthikeyan vadivel <karthikeyaniecw@gmail.com>

Industrial Visit - Idhaya Engg college for women

Antuvan DS <ds_antuvan@vssc.gov.in>   Mon, Jul 8, 2019 at 10:25 AM
To: karthikeyan vadivel <karthikeyaniecw@gmail.com>

Dear Prof.Karthikeyan,

Nice to see your letter and the interest of your students undertaking a visit to VSSC/ISRO.

You are most welcome to come over here and we shall orange necessary pass for the visit.

I hope to be there with your team after return from Chandrayaan-II launch at Shriharikota.
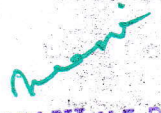
Regads

DS Antuvan

Senior Scientist, VSSC/ISRO

[Quoted text hidden]

📄 **ISRO-IV.pdf**
927K

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

IDHAYA ENGINEERING COLLEGE FOR WOMEN

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.
An ISO 9001 : 2015 Certified Institution
(A Unit of the Franciscan Sisters of the Immaculate Heart of Mary Society, Pondicherry)

Date: 5/07/19

REF: IECW / ADM / IND.VISIT / 2019

To

Shri. D. S. Antuvan,
Senior Scientist,
Vikram Sarabhai Space Centre,
Thiruvananthapuram,
Kerala, India, Pin Code:695022

Sir,

Sub: Request for permission to visit your Research center – Final year CSE,
EEE, ECE & IT students – Reg.

Greetings from Idhaya Engineering College for Women, Chinnasalem.

Idhaya Engineering College for Women is established and managed by Franciscan Sister of the Immaculate Heart of Mary Congregation to provide quality technical and professional education to the deserving women candidates. As a part of their regular curricular activities, every student has to undergo one industrial visit for every theory course offered. Our students of 4th year CSE, EEE, ECE & IT are very much interested to visit your center. So I am writing this letter to seek permission to visit preferably on 17th July, 2019.

Kindly give an orientation of the various facilities available at your center and we would be grateful for the same. We hope for your positive response at the earliest.

Total No. of students   :   89

No. of staff members accompanying   :   06

Thank you

Yours faithfully

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGINEERING COLLEGE FOR WOMEN
CHINNASALEM-606 201. VILLUPURAM DIST.

REF: IECW / CSE, EEE, ECE & IT / IV / 2019

Date: 25.07.2019

Department of CSE, EEE, ECE and IT

Place: Kerala

Days: (17th to 19th July 2019)

Industrial Visit and Educational tour Report

IECW organized a 3 days Industrial Visit and Educational Tour to ISRO, Trivandrum, from 17.07.2019 to 19.07.2019 for final year Students of CSE, EEE, ECE and IT department. The tour was organized with the prior permission and guidance from Principal. This tour gave a wide expo to the students. Totally 87 students along with 6 faculty member had joined in this grand endeavour.

DAY 1 (17/07/2019) –ISRO-Trivandrum

Visited Rocket launching at 12.00 p.m, Kovalam beach and Sree Padmanabhaswamy Temple.

DAY 2 (18/07/2019) –Kerala

Visited Thirparappu falls, Padmanabhaswamy palace and Church

DAY 3 (19/07/2019) – Kanyakumari

Visited Sunrise,Vivenkanda rock,Thiruvalluvar statue and Madurai meenachi amman temple.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.It
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201, KALLAKURICHI DT

IV COORDINATOR

3 0 0 3

OBJECTIVES:

- To acquaint the students with the construction, theory and operation of the basic electronic devices such as PN junction diode, Bipolar and Field effect Transistors, Power control devices, LED, LCD and other Opto-electronic devices

UNIT I   SEMICONDUCTOR DIODE   9

PN junction diode, Current equations, Energy Band diagram, Diffusion and drift current densities, forward and reverse bias characteristics, Transition and Diffusion Capacitances, Switching Characteristics, Breakdown in PN Junction Diodes.

UNIT II   BIPOLAR JUNCTION TRANSISTORS   9

NPN -PNP -Operations-Early effect-Current equations — Input and Output characteristics of CE,CB, CC - Hybrid -π model - h-parameter model, Ebers Moll Model- Gummel Poon-model, MultiEmitter Transistor.

UNIT III   FIELD EFFECT TRANSISTORS   9

JFETs — Drain and Transfer characteristics,-Current equations-Pinch off voltage and its significance- MOSFET-Characteristics- Threshold voltage -Channel length modulation, D- MOSFET, E-MOSFET- Characteristics — Comparison of MOSFET with JFET.

UNIT IV   SPECIAL SEMICONDUCTOR DEVICES   9

Metal-Semiconductor Junction- MESFET, FINFET, PINFET, CNTFET, DUAL GATE MOSFET, Schottky barrier diode-Zener diode-Varactor diode –Tunnel diode- Gallium Arsenide device, LASER diode, LDR.

UNIT V   POWER DEVICES AND DISPLAY DEVICES   9

UJT, SCR, Diac, Triac, Power BJT- Power MOSFET- DMOS-VMOS. LED, LCD, Photo transistor, Opto Coupler, Solar cell, CCD.

TOTAL : 45 PERIODS

OUTCOMES:

At the end of the course the students will be able to:

- Explain the V-I characteristic of diode, UJT and SCR

- Describe the equivalence circuits of transistors

- Operate the basic electronic devices such as PN junction diode, Bipolar and Field effect Transistors, Power control devices, LED, LCD and other Opto-electronic devices

TEXT BOOKS:

1. Donald A Neaman, ―Semiconductor Physics and Devices‖, Fourth Edition, Tata Mc GrawHillInc. 2012.

2. Salivahanan. S, Suresh Kumar. N, Vallavaraj.A, ―Electronic Devices and circuits‖, Third Edition,Tata McGraw- Hill, 2008.

REFERENCES:

1. Robert Boylestad and Louis Nashelsky, ―Electron Devices and Circuit Theory‖ PearsonPrentice Hall, 10th edition, July 2008.

2. R.S.Sedha, ― A Text Book of Applied Electronics‖ S.Chand Publications, 2006.

3. Yang, ―Fundamentals of Semiconductor devices‖, McGraw Hill International Edition, 1978.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EC8351   **ELECTRONIC CIRCUITS I**   **L T P C**
                                                                                    3 0 0 3

OBJECTIVES:

- To understand the methods of biasing transistors
- To design and analyze single stage and multistage amplifier circuits
- To analyze the frequency response of small signal amplifiers
- To design and analyze the regulated DC power supplies.
- To troubleshoot and fault analysis of power supplies.

UNIT I   BIASING OF DISCRETE BJT, JFET AND MOSFET   **9**

BJT– Need for biasing - DC Load Line and Bias Point – DC analysis of Transistor circuits - Various biasing methods of BJT —
Bias Circuit Design - Thermal stability - Stability factors - Bias compensation techniques using Diode, thermistor and sensistor —
Biasing BJT Switching Circuits- JFET - DC Load Line and Bias Point - Various biasing methods of JFET - JFET Bias Circuit
Design - MOSFET Biasing - Biasing FET Switching Circuits.

UNIT II   BJT AMPLIFIERS   **9**

Small Signal Hybrid π equivalent circuit of BJT — Early effect - Analysis of CE, CC and CB amplifiers using Hybrid π
equivalent circuits - AC Load Line Analysis- Darlington Amplifier - Bootstrap technique - Cascade, Cascode configurations -
Differential amplifier, Basic BJT differential pair — Small signal analysis and CMRR.

UNIT III   SINGLE STAGE FET, MOSFET AMPLIFIERS

Small Signal Hybrid π equivalent circuit of FET and MOSFET - Analysis of CS, CD and CGamplifiers using Hybrid π
equivalent circuits - Basic FET differential pair- BiCMOS circuits.

UNIT IV   FREQUENCY RESPONSE OF AMPLIFIERS   **9**

Amplifier frequency response – Frequency response of transistor amplifiers with circuit capacitors
– BJT frequency response – short circuit current gain - cut off frequency – fα, fβ and unity gain bandwidth – Miller effect -
frequency response of FET - High frequency analysis of CE and MOSFET CS amplifier - Transistor Switching Times.

UNIT V   POWER SUPPLIES AND ELECTRONIC DEVICE TESTING   **9**

Linear mode power supply - Rectifiers - Filters - Half-Wave Rectifier Power Supply - Full-Wave Rectifier Power Supply - Voltage
regulators: Voltage regulation - Linear series, shunt and switching Voltage Regulators - Over voltage protection - BJT and
MOSFET — Switched mode power supply (SMPS) - Power Supply Performance and Testing - Troubleshooting and Fault Analysis,
Design of Regulated DC Power Supply.

TOTAL: 45 PERIODS

OUTCOMES:

After studying this course, the student should be able to:

- Acquire knowledge of
  - Working principles, characteristics and applications of BJT and FET
  - Frequency response characteristics of BJT and FET amplifiers
- Analyze the performance of small signal BJT and FET amplifiers - single stage and multistage amplifiers
- Apply the knowledge gained in the design of Electronic circuits

TEXT BOOKS:

1. Donald. A. Neamen, Electronic Circuits Analysis and Design, 3rd Edition, Mc Graw HillEducation (India) Private Ltd., 2010.
   (Unit I-IV)
2. Robert L. Boylestad and Louis Nasheresky, —Electronic Devices and Circuit Theoryl, 11thEdition, Pearson Education, 2013.
   (Unit V)

REFERENCES

1. Millman J, Halkias.C.and Sathyabrada Jit, Electronic Devices and Circuits, 4th Edition, Mc Graw HillEducation (India) Private
   Ltd., 2015.
2. Salivahanan and N. Suresh Kumar, Electronic Devices and Circuits, 4th Edition, Mc Graw HillEducation (India) Private
   Ltd., 2017.
3. Floyd, Electronic Devices, Ninth Edition, Pearson Education, 2012.
4. David A. Bell, Electronic Devices & Circuits, 5th Edition, Oxford University Press, 2008.
5. Anwar A. Khan and Kanchan K. Dey, A First Course on Electronics, PHL 2006.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EC8352	SIGNALS AND SYSTEMS	L	T	P	C
		4	0	0	4

OBJECTIVES:

- To understand the basic properties of signal & systems
- To know the methods of characterization of LTI systems in time domain
- To analyze continuous time signals and system in the Fourier and Laplace domain
- To analyze discrete time signals and system in the Fourier and Z transform domain

UNIT I   CLASSIFICATION OF SIGNALS AND SYSTEMS   12

Standard signals- Step, Ramp, Pulse, Impulse, Real and complex exponentials and Sinusoids_ Classification of signals — Continuous time (CT) and Discrete Time (DT) signals, Periodic & Aperiodic signals, Deterministic & Random signals, Energy & Power signals - Classification of systems- CT systems and DT systems- — Linear & Nonlinear, Time-variant & Time-invariant, Causal & Non-causal, Stable & Unstable.

UNIT II   ANALYSIS OF CONTINUOUS TIME SIGNALS   12

Fourier series for periodic signals - Fourier Transform — properties- Laplace Transforms andproperties

UNIT III   LINEAR TIME INVARIANT CONTINUOUS TIME SYSTEMS   12

Impulse response - convolution integrals- Differential Equation- Fourier and Laplace transforms inAnalysis of CT systems - Systems connected in series / parallel.

UNIT IV   ANALYSIS OF DISCRETE TIME SIGNALS   12

Baseband signal Sampling – Fourier Transform of discrete time signals (DTFT) – Properties ofDTFT -   Z Transform & Properties

UNIT V   LINEAR TIME INVARIANT-DISCRETE TIME SYSTEMS   . 12

Impulse response — Difference equations-Convolution sum- Discrete Fourier Transform and ZTransform Analysis of Recursive & Non-Recursive systems-DT systems connected in series and
parallel.

TOTAL: 60 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- To be able to determine if a given system is linear/causal/stable
- Capable of determining the frequency components present in a deterministic signal
- Capable of characterizing LTI systems in the time domain and frequency domain
- To be able to compute the output of an LTI system in the time and frequency domains

TEXT BOOK:

1. Allan V.Oppenheim, S.Wilsky and S.H.Nawab, —Signals and Systemsl, Pearson, 2015.(Unit 1-V)

REFERENCES

1. B. P. Lathi, —Principles of Linear Systems and Signalsl, Second Edition, Oxford, 2009.

2. R.E.Zeimer, W.H.Tranter and R.D.Fannin, —Signals & Systems - Continuous andDiscretel, Pearson, 2007.

3. John Alan Stuller, —An Introduction to Signals and Systemsl, Thomson, 2007.

DIGITAL ELECTRONICS

EC8392

L	T	P	C
3	0	0	3

OBJECTIVES:

- To present the Digital fundamentals, Boolean algebra and its applications in digitalsystems
- To familiarize with the design of various combinational digital circuits using logic gates
- To introduce the analysis and design procedures for synchronous and asynchronoussequential circuits
- To explain the various semiconductor memories and related technology
- To introduce the electronic circuits involved in the making of logic gates

UNIT I   DIGITAL FUNDAMENTALS   9

Number Systems – Decimal, Binary, Octal, Hexadecimal, 1_s and 2_s complements, Codes – Binary, BCD, Excess 3, Gray, Alphanumeric codes, Boolean theorems, Logic gates, Universal gates, Sum of products and product of sums, Minterms and Maxterms, Karnaugh map Minimization and Quine-McCluskey method of minimization.

UNIT II   COMBINATIONAL CIRCUIT DESIGN   9

Design of Half and Full Adders, Half and Full Subtractors, Binary Parallel Adder – Carry lookahead Adder, BCD Adder, Multiplexer, Demultiplexer, Magnitude Comparator, Decoder, Encoder, Priority Encoder.

UNIT III   SYNCHRONOUS SEQUENTIAL CIRCUITS   9

Flip flops – SR, JK, T, D, Master/Slave FF – operation and excitation tables, Triggering of FF, Analysis and design of clocked sequential circuits – Design - Moore/Mealy models, state minimization, state assignment, circuit implementation – Design of Counters- Ripple Counters, Ring Counters, Shift registers, Universal Shift Register.

UNIT IV   ASYNCHRONOUS SEQUENTIAL CIRCUITS   9

Stable and Unstable states, output specifications, cycles and races, state reduction, race free assignments, Hazards, Essential Hazards, Pulse mode sequential circuits, Design of Hazard free circuits.

UNIT V   MEMORY DEVICES AND DIGITAL INTEGRATED CIRCUITS   9

Basic memory structure – ROM -PROM – EPROM – EEPROM –EAPROM, RAM – Static and dynamic RAM - Programmable Logic Devices – Programmable Logic Array (PLA) - Programmable Array Logic (PAL) – Field Programmable Gate Arrays (FPGA) - Implementation of combinational logic circuits using PLA, PAL.

Digital integrated circuits: Logic levels, propagation delay, power dissipation, fan-out and fan- in, noise margin, logic families and their characteristics-RTL, TTL, ECL, CMOS

TOTAL: 45   PERIODS

OUTCOMES:

At the end of the course:

- Use digital electronics in the present contemporary world
- Design various combinational digital circuits using logic gates
- Do the analysis and design procedures for synchronous and asynchronous sequentialcircuits
- Use the semiconductor memories and related technology
- Use electronic circuits involved in the design of logic gates

TEXT BOOK:

1. M. Morris Mano and Michael D. Ciletti, —Digital Design‖, 5th Edition, Pearson, 2014.

REFERENCES:

1. Charles H.Roth. —Fundamentals of Logic Design‖, 6th Edition, Thomson Learning, 2013.
2. Thomas L. Floyd, —Digital Fundamentals‖, 10th Edition, Pearson Education Inc, 2011
3. S.Salivahanan and S.Arivazhagan—Digital Electronics‖, Ist Edition, Vikas PublishingHouse pvt Ltd, 2012.
4. Anil K.Maini —Digital Electronics‖, Wiley, 2014.
5. A.Anand Kumar —Fundamentals of Digital Circuits‖, 4th Edition, PHI Learning PrivateLimited, 2016.
6. Soumitra Kumar Mandal — Digital Electronics‖, McGraw Hill Education Private Limited,2016.

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE,F.IE.;
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201, KALLAKURICHI DT.

EC8391   **CONTROL SYSTEMS ENGINEERING**   L   T   P   C
                                                                                 3   0   0   3

OBJECTIVES:

- To introduce the components and their representation of control systems
- To learn various methods for analyzing the time response, frequency response andstability of the systems.
- To learn the various approach for the state variable analysis.

UNIT I   SYSTEMS COMPONENTS AND THEIR REPRESENTATION   9

Control System: Terminology and Basic Structure-Feed forward and Feedback control theory- Electrical and Mechanical Transfer Function Models-Block diagram Models-Signal flow graphs models-DC and AC servo Systems-Synchronous -Multivariable control system

UNIT II   TIME RESPONSE ANALYSIS   9

Transient response-steady state response-Measures of performance of the standard first orderand second order system-effect on an additional zero and an additional pole-steady error constant and system- type number-PID control-Analytical design for PD, PI,PID control systems

UNIT III   FREQUENCY RESPONSE AND SYSTEM ANALYSIS   9

Closed loop frequency response-Performance specification in frequency domain-Frequency response of standard second order system- Bode Plot - Polar Plot- Nyquist plots-Design of compensators using Bode plots-Cascade lead compensation-Cascade lag compensation-Cascadelag-lead compensation

UNIT IV   CONCEPTS OF STABILITY ANALYSIS   9

Concept of stability-Bounded - Input Bounded - Output stability-Routh stability criterion-Relativestability-Root locus concept-Guidelines for sketching root locus-Nyquist stability criterion.

UNIT V   CONTROL SYSTEM ANALYSIS USING STATE VARIABLE METHODS   9

State variable representation-Conversion of state variable models to transfer functions-Conversion of transfer functions to state variable models-Solution of state equations-Concepts of Controllability and Observability-Stability of linear systems-Equivalence between transfer function and state variable representations-State variable analysis of digital control system-Digital control design using state feedback.

                                                                        TOTAL:45 PERIODS

OUTCOMES:

Upon completion of the course, the student should be able to:

- Identify the various control system components and their representations.
- Analyze the various time domain parameters.
- Analysis the various frequency response plots and its system.
- Apply the concepts of various system stability criterions.
- Design various transfer functions of digital control system using state variable models.

TEXT BOOK:

1. M.Gopal, —Control System – Principles and Designǁ, Tata McGraw Hill, 4th Edition, 2012.

REFERENCES:

1. J.Nagrath and M.Gopal, —Control System Engineeringǁ, New Age International Publishers,5 [th] Edition, 2007.

2. K. Ogata, ‚Modern Control Engineering', 5th edition, PHI, 2012.
3. S.K.Bhattacharya, Control System Engineering, 3rd Edition, Pearson, 2013.

4. Benjamin.C.Kuo, —Automatic control systemsǁ, Prentice Hall of India, 7th Edition,1995.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

                                                                         3   0   0   3

OBJECTIVES:

- To give a comprehensive exposure to all types of amplifiers and oscillators constructed with discrete components. This helps to develop a strong basis for building linear and digital integrated circuits
- To study about feedback amplifiers and oscillators principles
- To design oscillators.
- To study about turned amplifier.
- To understand the analysis and design of LC and RC oscillators, amplifiers, multivibrators, power amplifiers and DC convertors.

UNIT I   FEEDBACK AMPLIFIERS AND STABILITY   9

Feedback Concepts – gain with feedback – effect of feedback on gain stability, distortion,bandwidth, input and output impedances; topologies of feedback amplifiers – analysis of series-series, shunt-shunt and shunt-series feedback amplifiers-stability problem-Gain and
Phase-margins-Frequency compensation.

UNIT II   OSCILLATORS   9

Barkhausen criterion for oscillation – phase shift, Wien bridge - Hartley & Colpitt's oscillators – Clapp oscillator-Ring oscillators and crystal oscillators – oscillator amplitudestabilization.

UNIT III   TUNED AMPLIFIERS   9

Coil losses, unloaded and loaded Q of tank circuits, small signal tuned amplifiers — Analysis of capacitor coupled single tuned amplifier — double tuned amplifier - effect of cascading single tuned and double tuned amplifiers on bandwidth — Stagger tuned amplifiers - Stability of tuned amplifiers – Neutralization - Hazeltine neutralization method.

UNIT IV   WAVE SHAPING AND MULTIVIBRATOR CIRCUITS   9

Pulse circuits – attenuators – RC integrator and differentiator circuits – diode clampersand clippers –Multivibrators - Schmitt Trigger- UJT Oscillator.

UNIT V   POWER AMPLIFIERS AND DC CONVERTERS   9

Power amplifiers- class A-Class B-Class AB-Class C-Power MOSFET-Temperature Effect- Class AB Power amplifier using MOSFET –DC/DC convertors — Buck, Boost, Buck-Boost analysis and design

                                                      TOTAL: 45   PERIODS

OUTCOMES:

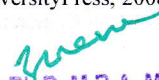**Upon completion of the course, the student should be able to:**
- Analyze different types of amplifier, oscillator and multivibrator circuits
- Design BJT amplifier and oscillator circuits
- Analyze transistorized amplifier and oscillator circuits
- Design and analyze feedback amplifiers
- Design LC and RC oscillators, tuned amplifiers, wave shaping circuits,multivibrators, power amplifier and DC convertors.

TEXT BOOKS:

1. Sedra and Smith, ―Micro Electronic Circuits‖; Sixth Edition, Oxford University Press,2011. (UNIT I, III,IV,V)

2. Jacob Millman, ‚Microelectronics‘, McGraw Hill, 2nd Edition, Reprinted, 2009. (UNIT I,II,IV,V)

REFERENCES:

1. Robert L. Boylestad and Louis Nasheresky, ―Electronic Devices and CircuitTheory‖, 10th Edition, Pearson Education / PHI, 2008
2. David A. Bell, ―Electronic Devices and Circuits‖, Fifth Edition, Oxford UniversityPress, 2008.

3. Millman J. and Taub H., ―Pulse Digital and Switching Waveforms‖, TMH, 2000.
4. Millman and Halkias. C., Integrated Electronics, DMR 2007

EC8451	ELECTROMAGNETIC FIELDS	L	T	P	C
		4	0	0	4

OBJECTIVES:

- To gain conceptual and basic mathematical understanding of electric and magnetic fields in free space and in materials
- To understand the coupling between electric and magnetic fields through Faraday's law, displacement current and Maxwell's equations
- To understand wave propagation in lossless and in lossy media
- To be able to solve problems based on the above concepts

UNIT I   INTRODUCTION   12

Electromagnetic model, Units and constants, Review of vector algebra, Rectangular, cylindrical and spherical coordinate systems, Line, surface and volume integrals, Gradient of a scalar field, Divergence of a vector field, Divergence theorem, Curl of a vector field, Stoke's theorem, Null identities, Helmholtz's theorem

UNIT II   ELECTROSTATICS   12

Electric field, Coulomb's law, Gauss's law and applications, Electric potential, Conductors in static electric field, Dielectrics in static electric field, Electric flux density and dielectric constant, Boundary conditions, Capacitance, Parallel, cylindrical and spherical capacitors, Electrostatic energy, Poisson's and Laplace's equations, Uniqueness of electrostatic solutions, Current density and Ohm's law, Electromotive force and Kirchhoff's voltage law, Equation of continuity and Kirchhoff's current law

UNIT III   MAGNETOSTATICS   12

Lorentz force equation, Law of no magnetic monopoles, Ampere's law, Vector magnetic potential, Biot-Savart law and applications, Magnetic field intensity and idea of relative permeability, Magnetic circuits, Behaviour of magnetic materials, Boundary conditions, Inductance and inductors, Magnetic energy, Magnetic forces and torques

UNIT IV   TIME-VARYING FIELDS AND MAXWELL's EQUATIONS   12

Faraday's law, Displacement current and Maxwell-Ampere law, Maxwell's equations, Potential functions, Electromagnetic boundary conditions, Wave equations and solutions, Time-harmonic fields

UNIT V   PLANE ELECTROMAGNETIC WAVES   12

Plane waves in lossless media, Plane waves in lossy media (low-loss dielectrics and good conductors), Group velocity, Electromagnetic power flow and Poynting vector, Normal incidence at a plane conducting boundary, Normal incidence at a plane dielectric boundary

TOTAL:60 PERIODS

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

- Display an understanding of fundamental electromagnetic laws and concepts
- Write Maxwell's equations in integral, differential and phasor forms and explain their physical meaning
- Explain electromagnetic wave propagation in lossy and in lossless media
- Solve simple problems requiring estimation of electric and magnetic field quantities based on these concepts and laws
-

TEXT BOOKS:

1. D.K. Cheng, Field and wave electromagnetics, 2nd ed., Pearson (India), 1989 (UNIT I, II,III IV,V)

2. W.H. Hayt and J.A. Buck, Engineering electrmagnetics, 7th ed., McGraw-Hill (India), 2006 (UNIT I-V)

REFERENCES

1. D.J. Griffiths, Introduction to electrodynamics, 4th ed., Pearson (India), 2013

2. B.M. Notaros, Electromagnetics, Pearson: New Jersey, 2011

3. M.N.O. Sadiku and S.V. Kulkarni, Principles of electromagnetics, 6th ed., Oxford (Asian Edition), 2015

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

	L	T	P	C
EC8453 **LINEAR INTEGRATED CIRCUITS**	3	0	0	3

OBJECTIVES:

- To introduce the basic building blocks of linear integrated circuits
- To learn the linear and non-linear applications of operational amplifiers
- To introduce the theory and applications of analog multipliers and PLL
- To learn the theory of ADC and DAC
- To introduce the concepts of waveform generation and introduce some special functionICs

UNIT I   BASICS OF OPERATIONAL AMPLIFIERS   9

Current mirror and current sources, Current sources as active loads, Voltage sources, Voltage References, BJT Differential amplifier with active loads, Basic information about op-amps – Ideal Operational Amplifier - General operational amplifier stages -and internal circuit diagrams of IC 741, DC and AC performance characteristics, slew rate, Open and closed loop configurations – JFET Operational Amplifiers – LF155 and TL082.

UNIT II   APPLICATIONS OF OPERATIONAL AMPLIFIERS   9

Sign Changer, Scale Changer, Phase Shift Circuits, Voltage Follower, V-to-I and I-to-V converters, adder, subtractor, Instrumentation amplifier, Integrator, Differentiator, Logarithmic amplifier, Antilogarithmic amplifier, Comparators, Schmitt trigger, Precision rectifier, peak detector, clipper and clamper, Low-pass, high-pass and band-pass Butterworth filters.

UNIT III   ANALOG MULTIPLIER AND PLL   9

Analog Multiplier using Emitter Coupled Transistor Pair - Gilbert Multiplier cell — Variable transconductance technique, analog multiplier ICs and their applications, Operation of the basic PLL, Closed loop analysis, Voltage controlled oscillator, Monolithic PLL IC 565, application of PLL for AM detection, FM detection, FSK modulation and demodulation and Frequency synthesizing and clock synchronisation.

UNIT IV   ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERTERS   9

Analog and Digital Data Conversions, D/A converter – specifications - weighted resistor type, R-2R Ladder type, Voltage Mode and Current-Mode R - $2R$ Ladder types - switches for D/A converters, high speed sample-and-hold circuits, A/D Converters — specifications - Flash type - Successive Approximation type - Single Slope type – Dual Slope type - A/D Converter using Voltage-to-TimeConversion - Over-sampling A/D Converters, Sigma — Delta converters.

UNIT V   WAVEFORM GENERATORS AND SPECIAL FUNCTION ICS   9

Sine-wave generators, Multivibrators and Triangular wave generator, Saw-tooth wave generator, ICL8038 function generator, Timer IC 555, IC Voltage regulators — Three terminal fixed and adjustable voltage regulators - IC 723 general purpose regulator - Monolithic switching regulator, Low Drop — Out(LDO) Regulators - Switched capacitor filter IC MF10, Frequency to Voltage and Voltage to Frequency converters, Audio Power amplifier, Video Amplifier, Isolation Amplifier, Opto-couplers and fibre optic IC.

TOTAL:45 PERIODS

TEXT BOOKS:

1. D.Roy Choudhry, Shail Jain, —Linear Integrated Circuits‖, New Age InternationalPvt. Ltd., 2018, Fifth Edition.
    (Unit I – V)
2. Sergio Franco, —Design with Operational Amplifiers and Analog IntegratedCircuits‖, 4th Edition, Tata Mc Graw-Hill, 2016 (Unit I – V)

REFERENCES:

1. Ramakant A. Gayakwad, —OP-AMP and Linear ICs‖, 4th Edition, Prentice Hall / PearsonEducation, 2015.
2. Robert F.Coughlin, Frederick F.Driscoll, —Operational Amplifiers and Linear IntegratedCircuits‖, Sixth Edition, PHI, 2001.
3. B.S.Sonde, —System design using Integrated Circuits‖ , 2nd Edition, New Age Pub, 2001.
4. Gray and Meyer, —Analysis and Design of Analog Integrated Circuits‖, Wiley International,5th Edition, 2009.
5. William D.Stanley, —Operational Amplifiers with Linear Integrated Circuits‖, PearsonEducation,4th Edition,2001.
6. S.Salivahanan & V.S. Kanchana Bhaskaran, —Linear Integrated Circuits‖, TMH,2nd Edition,4th Reprint, 2016.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EC8451   **ELECTROMAGNETIC FIELDS**   L   T   P   C
                                                           4   0   0   4

OBJECTIVES:

- To gain conceptual and basic mathematical understanding of electric and magnetic fields in free space and in materials
- To understand the coupling between electric and magnetic fields through Faraday's law, displacement current and Maxwell's equations
- To understand wave propagation in lossless and in lossy media
- To be able to solve problems based on the above concepts

UNIT I   INTRODUCTION   12

Electromagnetic model, Units and constants, Review of vector algebra, Rectangular, cylindrical and spherical coordinate systems, Line, surface and volume integrals, Gradient of a scalar field, Divergence of a vector field, Divergence theorem, Curl of a vector field, Stoke's theorem, Null identities, Helmholtz's theorem

UNIT II   ELECTROSTATICS   12

Electric field, Coulomb's law, Gauss's law and applications, Electric potential, Conductors in static electric field, Dielectrics in static electric field, Electric flux density and dielectric constant, Boundary conditions, Capacitance, Parallel, cylindrical and spherical capacitors, Electrostatic energy, Poisson's and Laplace's equations, Uniqueness of electrostatic solutions, Current density and Ohm's law, Electromotive force and Kirchhoff's voltage law, Equation of continuity and Kirchhoff's current law

UNIT III   MAGNETOSTATICS   12

Lorentz force equation, Law of no magnetic monopoles, Ampere's law, Vector magnetic potential, Biot-Savart law and applications, Magnetic field intensity and idea of relative permeability, Magnetic circuits, Behaviour of magnetic materials, Boundary conditions, Inductance and inductors, Magnetic energy, Magnetic forces and torques

UNIT IV   TIME-VARYING FIELDS AND MAXWELL's EQUATIONS   12

Faraday's law, Displacement current and Maxwell-Ampere law, Maxwell's equations, Potential functions, Electromagnetic boundary conditions, Wave equations and solutions, Time-harmonic fields

UNIT V   PLANE ELECTROMAGNETIC WAVES   12

Plane waves in lossless media, Plane waves in lossy media (low-loss dielectrics and good conductors), Group velocity, Electromagnetic power flow and Poynting vector, Normal incidence at a plane conducting boundary, Normal incidence at a plane dielectric boundary

TOTAL:60 PERIODS

OUTCOMES:

By the end of this course, the student should be able to:
- Display an understanding of fundamental electromagnetic laws and concepts
- Write Maxwell's equations in integral, differential and phasor forms and explain their physical meaning
- Explain electromagnetic wave propagation in lossy and in lossless media
- Solve simple problems requiring estimation of electric and magnetic field quantities based on these concepts and laws
-

TEXT BOOKS:

1. D.K. Cheng, Field and wave electromagnetics, 2nd ed., Pearson (India), 1989 (UNIT I, II,III IV,V)
2. W.H. Hayt and J.A. Buck, Engineering electrmagnetics, 7th ed., McGraw-Hill (India), 2006 (UNIT I-V)

REFERENCES

1. D.J. Griffiths, Introduction to electrodynamics, 4th ed., Pearson (India), 2013
2. B.M. Notaros, Electromagnetics, Pearson: New Jersey, 2011
3. M.N.O. Sadiku and S.V. Kulkarni, Principles of electromagnetics, 6th ed., Oxford (Asian Edition), 2015

Dr.R.GURUMANI,M.E,Ph.D,M.B.A,M.ISTE,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EC8501	DIGITAL COMMUNICATION	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To know the principles of sampling & quantization
- To study the various waveform coding schemes
- To learn the various baseband transmission schemes
- To understand the various band pass signaling schemes
- To know the fundamentals of channel coding

UNIT I   INFORMATION THEORY   9

Discrete Memoryless source, Information, Entropy, Mutual Information - Discrete Memoryless channels – Binary Symmetric Channel, Channel Capacity - Hartley - Shannon law - Source codingtheorem - Shannon - Fano & Huffman codes.

UNIT II   WAVEFORM CODING & REPRESENTATION   9

Prediction filtering and DPCM - Delta Modulation - ADPCM & ADM principles-Linear Predictive Coding- Properties of Line codes- Power Spectral Density of Unipolar / Polar RZ & NRZ — Bipolar NRZ - Manchester

UNIT III   BASEBAND TRANSMISSION & RECEPTION   9

ISI – Nyquist criterion for distortion less transmission – Pulse shaping – Correlative coding - Eyepattern – Receiving Filters-Matched Filter, Correlation receiver, Adaptive Equalization

UNIT IV   DIGITAL MODULATION SCHEME   9

Geometric Representation of signals - Generation, detection, PSD & BER of Coherent BPSK, BFSK & QPSK - QAM - Carrier Synchronization - Structure of Non-coherent Receivers - Principleof DPSK.

UNIT V   ERROR CONTROL CODING   9

Channel coding theorem - Linear Block codes - Hamming codes - Cyclic codes - Convolutionalcodes - Viterbi Decoder.

TOTAL:45 PERIODS

OUTCOMES:

Upon completion of the course, the student should be able to

- Design PCM systems
- Design and implement base band transmission schemes
- Design and implement band pass signaling schemes
- Analyze the spectral characteristics of band pass signaling schemes and their noiseperformance
- Design error control coding schemes

TEXT BOOK:

1.   S. Haykin, —Digital Communications‖, John Wiley, 2005 (Unit I –V)

REFERENCES

1. B. Sklar, —Digital Communication Fundamentals and Applications‖, 2nd Edition, PearsonEducation, 2009

2. B.P.Lathi, —Modern Digital and Analog Communication Systems‖ 3rd Edition, Oxford UniversityPress 2007.

3. H P Hsu, Schaum Outline Series - —Analog and Digital Communications‖, TMH 2006

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EC8553	DISCRETE-TIME SIGNAL PROCESSING	L	T	P	C
		4	0	0	4

OBJECTIVES:

- To learn discrete fourier transform, properties of DFT and its application to linear filtering
- To understand the characteristics of digital filters, design digital IIR and FIR filters andapply these filters to filter undesirable signals in various frequency bands
- To understand the effects of finite precision representation on digital filters
- To understand the fundamental concepts of multi rate signal processing and itsapplications
- To introduce the concepts of adaptive filters and its application to communicationengineering

UNIT I	DISCRETE FOURIER TRANSFORM	12

Review of signals and systems, concept of frequency in discrete-time signals, summary ofanalysis & synthesis equations for FT & DTFT, frequency domain sampling, Discrete Fourier transform (DFT) - deriving DFT from DTFT, properties of DFT - periodicity, symmetry, circular convolution. Linear filtering using DFT. Filtering long data sequences - overlap save and overlap add method. Fast computation of DFT - Radix-2 Decimation-in-time (DIT) Fast Fourier transform (FFT), Decimation-in-frequency (DIF) Fast Fourier transform (FFT). Linear filtering using FFT.

UNIT II	INFINITE IMPULSE RESPONSE FILTERS	12

Characteristics of practical frequency selective filters. characteristics of commonly used analog filters - Butterworth filters, Chebyshev filters. Design of IIR filters from analog filters (LPF, HPF, BPF, BRF) - Approximation of derivatives, Impulse invariance method, Bilinear transformation. Frequency transformation in the analog domain. Structure of IIR filter - direct form I, direct form II,Cascade, parallel realizations.

UNIT III	FINITE IMPULSE RESPONSE FILTERS	12

Design of FIR filters - symmetric and Anti-symmetric FIR filters - design of linear phase FIR filters using Fourier series method - FIR filter design using windows (Rectangular, Hamming and Hanning window), Frequency sampling method. FIR filter structures - linear phase structure, direct form realizations

UNIT IV	FINITE WORD LENGTH EFFECTS	12

Fixed point and floating point number representation - ADC - quantization - truncation and rounding - quantization noise - input / output quantization - coefficient quantization error - productquantization error - overflow error - limit cycle oscillations due to product quantization and summation - scaling to prevent overflow.

UNIT V	INTRODUCTION TO DIGITAL SIGNAL PROCESSORS	12

DSP functionalities - circular buffering – DSP architecture – Fixed and Floating point architectureprinciples – Programming – Application examples.

TOTAL:60PERIODS

OUTCOMES:

At the end of the course, the student should be able to

- Apply DFT for the analysis of digital signals and systems
- Design IIR and FIR filters
- Characterize the effects of finite precision representation on digital filters
- Apply adaptive filters appropriately in communication systems

TEXT BOOK:

1. John G. Proakis & Dimitris G.Manolakis, ―Digital Signal Processing ― Principles, Algorithms & Applications‖, Fourth Edition, Pearson Education / Prentice Hall, 2007. (UNIT I ― V)

REFERENCES:

1. Emmanuel C. Ifeachor & Barrie. W. Jervis, ―Digital Signal Processing‖, Second Edition,Pearson Education / Prentice Hall, 2002.

2. A. V. Oppenheim, R.W. Schafer and J.R. Buck, ―Discrete-Time Signal Processing‖, 8thIndian Reprint, Pearson, 2004.

3. Sanjit K. Mitra, ―Digital Signal Processing – A Computer Based Approach‖, Tata Mc GrawHill, 2007.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

EC8552   **COMPUTER ARCHITECTURE AND ORGANIZATION**   L T P C
                                                                                      3 0 0 3

OBJECTIVES:
- To make students understand the basic structure and operation of digital computer
- To familiarize with implementation of fixed point and floating-point arithmetic operations
- To study the design of data path unit and control unit for processor
- To understand the concept of various memories and interfacing
- To introduce the parallel processing technique

UNIT I   COMPUTER ORGANIZATION & INSTRUCTIONS   9

Basics of a computer system: Evolution, Ideas, Technology, Performance, Power wall, Uniprocessors to Multiprocessors. Addressing and addressing modes. Instructions: Operations and Operands, Representing instructions, Logical operations, control operations.

UNIT II   ARITHMETIC   9

Fixed point Addition, Subtraction, Multiplication and Division. Floating Point arithmetic, Highperformance arithmetic, Subword parallelism

UNIT III   THE PROCESSOR   9

Introduction, Logic Design Conventions, Building a Datapath - A Simple Implementation scheme - An Overview of Pipelining - Pipelined Datapath and Control. Data Hazards: Forwarding versusStalling, Control Hazards, Exceptions, Parallelism via Instructions.

UNIT IV   MEMORY AND I/O ORGANIZATION   9

Memory hierarchy, Memory Chip Organization, Cache memory, Virtual memory.
Parallel Bus Architectures, Internal Communication Methodologies, Serial Bus Architectures, Massstorage, Input and Output Devices.

UNIT V   ADVANCED COMPUTER ARCHITECTURE   9

Parallel processing architectures and challenges, Hardware multithreading, Multicore and sharedmemory multiprocessors, Introduction to Graphics Processing Units, Clusters and Warehouse
scale computers - Introduction to Multiprocessor network topologies.

                                                                      TOTAL:45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to
- Describe data representation, instruction formats and the operation of a digital computer
- Illustrate the fixed point and floating-point arithmetic for ALU operation
- Discuss about implementation schemes of control unit and pipeline performance
- Explain the concept of various memories, interfacing and organization of multiple processors
- Discuss parallel processing technique and unconventional architectures

TEXT BOOKS:

1. David A. Patterson and John L. Hennessey, ―Computer Organization and Design‖, Fifthedition, Morgan Kauffman / Elsevier, 2014. (UNIT I-V)

2. Miles J. Murdocca and Vincent P. Heuring, ―Computer Architecture and Organization: AnIntegrated approach‖, Second edition, Wiley India Pvt Ltd, 2015 (UNIT IV,V)

REFERENCES

1. V. Carl Hamacher, Zvonko G. Varanesic and Safat G. Zaky, ―Computer Organization―,Fifthedition, Mc Graw-Hill Education India Pvt Ltd, 2014.

2. William Stallings ―Computer Organization and Architecture‖, Seventh Edition, PearsonEducation, 2006.

3. Govindarajalu, ―Computer Architecture and Organization, Design Principles and Applications", Second edition, McGraw-Hill Education India Pvt Ltd, 2014.

EC8095	VLSI DESIGN	L	T	P	C
		3	0	0	3

OBJECTIVES:

- Study the fundamentals of CMOS circuits and its characteristics.
- Learn the design and realization of combinational & sequential digital circuits.
- Architectural choices and performance tradeoffs involved in designing and realizing thecircuits in CMOS technology are discussed
- Learn the different FPGA architectures and testability of VLSI circuits.

UNIT I   INTRODUCTION TO MOS TRANSISTOR   9

MOS Transistor, CMOS logic, Inverter, Pass Transistor, Transmission gate, Layout Design Rules, Gate Layouts, Stick Diagrams, Long-Channel I-V Charters tics, C-V Charters tics, Non ideal I-V Effects, DC Transfer characteristics, RC Delay Model, Elmore Delay, Linear Delay Model, Logicaleffort, Parasitic Delay, Delay in Logic Gate, Scaling.

UNIT II   COMBINATIONAL MOS LOGIC CIRCUITS   9

Circuit Families: Static CMOS, Ratioed Circuits, Cascode Voltage Switch Logic, Dynamic Circuits, Pass Transistor Logic, Transmission Gates, Domino, Dual Rail Domino, CPL, DCVSPG, DPL, Circuit Pitfalls. **Power:** Dynamic Power, Static Power, Low Power Architecture.

UNIT III   SEQUENTIAL CIRCUIT DESIGN   9

Static latches and Registers, Dynamic latches and Registers, Pulse Registers, Sense Amplifier Based Register, Pipelining, Schmitt Trigger, Monostable Sequential Circuits, Astable Sequential Circuits. **Timing Issues :** Timing Classification Of Digital System, Synchronous Design

UNIT IV   DESIGN OF ARITHMETIC BUILDING BLOCKS AND SUBSYSTEM   9

Arithmetic Building Blocks: Data Paths, Adders, Multipliers, Shifters, ALUs, power and speedtradeoffs, Case Study: Design as a tradeoff. **Designing Memory and Array structures**: Memory Architectures and Building Blocks, Memory Core, Memory Peripheral Circuitry.

UNIT V   IMPLEMENTATION STRATEGIES AND TESTING   9

FPGA Building Block Architectures, FPGA Interconnect Routing Procedures. Design for Testability: *Ad Hoc* Testing, Scan Design, BIST, IDDQ Testing, Design for Manufacturability,Boundary Scan.

TOTAL : 45 PERIODS

OUTCOMES:
UPON COMPLETION OF THE COURSE, STUDENTS SHOULD BE ABLE TO

- Realize the concepts of digital building blocks using MOS transistor.
- Design combinational MOS circuits and power strategies.
- Design and construct Sequential Circuits and Timing systems.
- Design arithmetic building blocks and memory subsystems.
- Apply and implement FPGA design flow and testing.

TEXT BOOKS:

1.   Neil H.E. Weste, David Money Harris —CMOS VLSI Design: A Circuits and SystemsPerspective‖, 4th Edition, Pearson , 2017 (UNIT I,II,V)
2.   J n M. Rabaey ,Anantha Chandrakasan, Borivoje. Nikolic, ‖Digital Integrated Circuits:ADesign perspective‖, Second Edition , Pearson , 2016.(UNIT III,IV)

REFERENCES

1.   M.J. Smith, —Application Specific Integrated Circuits‖, Addisson Wesley, 1997
2.   Sung-Mo kang, Yusuf leblebici, Chulwoo Kim —CMOS Digital Integrated Circuits:Analysis& Design‖,4th edition McGraw Hill Education,2013
3.   Wayne Wolf, —Modern VLSI Design: System On Chip‖, Pearson Education, 2007

EC8652	WIRELESS COMMUNICATION	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To study the characteristic of wireless channel
- To understand the design of a cellular system
- To study the various digital signaling techniques and multipath mitigation techniques
- To understand the concepts of multiple antenna techniques

UNIT I   WIRELESS CHANNELS   9

Large scale path loss – Path loss models: Free Space and Two-Ray models -Link Budgetdesign – Small scale fading- Parameters of mobile multipath channels – Time dispersion parameters-Coherence bandwidth – Doppler spread & Coherence time, fading due to Multipath time delay spread – flat fading – frequency selective fading – Fading due to Doppler spread – fast fading – slow fading.

UNIT II   CELLULAR ARCHITECTURE   9

Multiple Access techniques - FDMA, TDMA, CDMA – Capacity calculations–Cellular concept- Frequency reuse - channel assignment- hand off- interference & system capacity- trunking & grade of service – Coverage and capacity improvement.

UNIT III   DIGITAL SIGNALING FOR FADING CHANNELS   9

Structure of a wireless communication link, Principles of Offset-QPSK, p/4-DQPSK, Minimum Shift Keying, Gaussian Minimum Shift Keying, Error performance in fading channels, OFDM principle – Cyclic prefix, Windowing, PAPR.

UNIT IV   MULTIPATH MITIGATION TECHNIQUES   9

Equalisation – Adaptive equalization, Linear and Non-Linear equalization, Zero forcing and LMS Algorithms. Diversity – Micro and Macro diversity, Diversity combining techniques, Error probability in fading channels with diversity reception, Rake receiver.

UNIT V   MULTIPLE ANTENNA TECHNIQUES   9

MIMO systems – spatial multiplexing -System model -Pre-coding - Beam forming -transmitter diversity, receiver diversity- Channel state information-capacity in fading and
non-fading channels.

TOTAL: 45   PERIODS

OUTCOMES:

The student should be able to:

- Characterize a wireless channel and evolve the system design specifications
- Design a cellular system based on resource availability and traffic demands
- Identify suitable signaling and multipath mitigation techniques for the wirelesschannel and system under consideration.

TEXT BOOKS:

1. Rappaport,T.S., ―Wireless communications‖, Pearson Education, Second Edition,2010.(UNIT I, II, IV)

2. Andreas.F. Molisch, ―Wireless Communications‖, John Wiley – India, 2006. (UNITIII,V)

REFERENCES:

1. Wireless Communication –Andrea Goldsmith, Cambridge University Press, 2011
2. Van Nee, R. and Ramji Prasad, ―OFDM for wireless multimedia communications,Artech House, 2000
3. David Tse and Pramod Viswanath, ―Fundamentals of Wireless Communication,Cambridge University Press, 2005.
4. Upena Dalal, ―Wireless Communication‖, Oxford University Press, 2009.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

TRANSMISSION LINES AND RF SYSTEMS   L   T   P   C
                                                                        3   0   0   3

OBJECTIVES:

- To introduce the various types of transmission lines and its characteristics
- To give thorough understanding about high frequency line, power and impedancemeasurements
- To impart technical knowledge in impedance matching using smith chart
- To introduce passive filters and basic knowledge of active RF components
- To get acquaintance with RF system transceiver design

UNIT I   TRANSMISSION LINE THEORY   9

General theory of Transmission lines - the transmission line - general solution - The infinite line - Wavelength, velocity of propagation - Waveform distortion - the distortion-less line - Loading anddifferent methods of loading - Line not terminated in Z0 - Reflection coefficient - calculation of current, voltage, power delivered and efficiency of transmission - Input and transfer impedance - Open and short circuited lines - reflection factor and reflection loss.

UNIT II   HIGH FREQUENCY TRANSMISSION LINES   9

Transmission line equations at radio frequencies - Line of Zero dissipation - Voltage and current on the dissipation-less line, Standing Waves, Nodes, Standing Wave Ratio - Input impedance of the dissipation-less line - Open and short circuited lines - Power and impedance measurement on lines - Reflection losses - Measurement of VSWR and wavelength.

UNIT III   IMPEDANCE MATCHING IN HIGH FREQUENCY LINES   9

Impedance matching: Quarter wave transformer - Impedance matching by stubs - Single stub and double stub matching - Smith chart - Solutions of problems using Smith chart - Single and double stub matching using Smith chart.

UNIT IV   WAVEGUIDES   9

General Wave behavior along uniform guiding structures – Transverse Electromagnetic Waves, Transverse Magnetic Waves, Transverse Electric Waves – TM and TE Waves between parallel plates. Field Equations in rectangular waveguides, TM and TE waves in rectangular waveguides, Bessel Functions, TM and TE waves in Circular waveguides.

UNIT V   RF SYSTEM DESIGN CONCEPTS   9

Active RF components: Semiconductor basics in RF, bipolar junction transistors, RF field effect transistors, High electron mobility transistors Basic concepts of RF design, Mixers, Low noise amplifiers, voltage control oscillators, Power amplifiers, transducer power gain and stability considerations.

TOTAL:45 PERIODS

OUTCOMES:

Upon completion of the course, the student should be able to:

- Explain the characteristics of transmission lines and its losses
- Write about the standing wave ratio and input impedance in high frequencytransmission lines
- Analyze impedance matching by stubs using smith charts
- Analyze the characteristics of TE and TM waves
- Design a RF transceiver system for wireless communication

TEXT BOOKS:

1. John D Ryder, ―Networks, lines and fields‖, 2nd Edition, Prentice Hall India, 2015. (UNIT I-IV)
2. Mathew M. Radmanesh, ―Radio Frequency &Microwave Electronics‖, Pearson EducationAsia, Second Edition,2002. (UNIT V)

REFERENCES:

1. Reinhold Ludwig and Powel Bretchko, RF Circuit Design ― Theory and Applications,Pearson Education Asia, First Edition,2001.
2. D. K. Misra, Radio Frequency and Microwave Communication Circuits- Analysis andDesign, John Wiley & Sons, 2004.
3. E.C.Jordan and K.G. Balmain, ―Electromagnetic Waves and Radiating Systems PrenticeHall of India, 2006.
4. G.S.N Raju, "Electromagnetic Field Theory and Transmission Lines Pearson Education,First edition 2005.

EC8004	WIRELESS NETWORKS	L	T	P	C
		3	0	0	3

OBJECTIVES:

The student should be made:

- To understand the concept about Wireless networks, protocol stack and standards
- To understand and analyse the network layer solutions for Wireless networks
- To study about fundamentals of 3G Services, its protocols and applications
- To have in depth knowledge on internetworking of WLAN and WWAN
- To learn about evolution of 4G Networks, its architecture and applications

UNIT I WIRELESS LAN 9

Introduction-WLAN technologies: - IEEE802.11: System architecture, protocol architecture, 802.11b, 802.11a – Hiper LAN: WATM, BRAN, HiperLAN2 – Bluetooth: Architecture, WPAN –IEEE 802.15.4, Wireless USB, Zigbee, 6LoWPAN, WirelessHART

UNIT II MOBILE NETWORK LAYER 9

Introduction - Mobile IP: IP packet delivery, Agent discovery, tunneling and encapsulation, IPV6-Network layer in the internet-Mobile IP session initiation protocol - mobile ad-hoc network: Routing: Destination Sequence distance vector, IoT: CoAP

UNIT III 3G OVERVIEW 9

Overview of UTMS Terrestrial Radio access network-UMTS Core network Architecture: 3GPP Architecture, User equipment, CDMA2000 overview- Radio and Network components, Network structure, Radio Network, TD-CDMA, TD – SCDMA.

UNIT IV INTERNETWORKING BETWEEN WLANS AND WWANS 9

Internetworking objectives and requirements, Schemes to connect WLANS and 3G Networks, Session Mobility, Internetworking Architecture for WLAN and GPRS, System Description,Local Multipoint Distribution Service, Multichannel Multipoint Distribution System.

UNIT V 4G & Beyond 9

Introduction – 4G vision – 4G features and challenges - Applications of 4G – 4G Technologies: Multicarrier Modulation, Smart antenna techniques, IMS Architecture, LTE, AdvancedBroadband Wireless Access and Services, MVNO.

TOTAL:45 PERIODS

OUTCOMES:

Upon completion of the course, the student would be able to:

- Conversant with the latest 3G/4G networks and its architecture
- Design and implement wireless network environment for any application using latestwireless protocols and standards
- Ability to select the suitable network depending on the availability and requirement
- Implement different type of applications for smart phones and mobile devices withlatest network strategies

TEXT BOOKS:

1. Jochen Schiller, ‖Mobile Communications‖, Second Edition, Pearson Education 2012.(Unit I,II,III)

2. Vijay Garg, ―Wireless Communications and networking‖, First Edition, Elsevier 2007.(UnitIV,V)

REFERENCES:

1. Erik Dahlman, Stefan Parkvall, Johan Skold and Per Beming, "3G Evolution HSPA and LTEfor Mobile Broadband‖, Second Edition, Academic Press, 2008.

2. Anurag Kumar, D.Manjunath, Joy kuri, ―Wireless Networking‖, First Edition, Elsevier 2011.\

3. Simon Haykin , Michael Moher, David Koilpillai, ―Modern Wireless Communications‖, FirstEdition, Pearson Education 2013

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

OBJECTIVES:
- To inculcate understanding of the basics required for circuit representation of RF networks.
- To deal with the issues in the design of microwave amplifier.
- To instill knowledge on the properties of various microwave components.
- To deal with the microwave generation and microwave measurement techniques

UNIT I   TWO PORT NETWORK THEORY   9

Review of Low frequency parameters: Impedance, Admittance, Hybrid and ABCD parameters, Different types of interconnection of Two port networks, High Frequency parameters, Formulation of S parameters, Properties of S parameters, Reciprocal and lossless Network, Transmission matrix, RF behavior of Resistors, Capacitors and Inductors.

UNIT II   RF AMPLIFIERS AND MATCHING NETWORKS   9

Characteristics of Amplifiers, Amplifier power relations, Stability considerations, Stabilization Methods, Noise Figure, Constant VSWR, Broadband, High power and Multistage Amplifiers, Impedance matching using discrete components, Two component matching Networks, Frequency response and quality factor, T and Pi Matching Networks, Microstrip Line Matching Networks.

UNIT III   PASSIVE AND ACTIVE MICROWAVE DEVICES   9

Terminations, Attenuators, Phase shifters, Directional couplers, Hybrid Junctions, Power dividers, Circulator, Isolator, Impedance matching devices: Tuning screw, Stub and quarter wave transformers. Crystal and Schottkey diode detector and mixers, PIN diode switch, Gunn diode oscillator, IMPATT diode oscillator and amplifier, Varactor diode, Introduction to MIC.

UNIT IV   MICROWAVE GENERATION   9

Review of conventional vacuum Triodes, Tetrodes and Pentodes, High frequency effects in vacuum Tubes, Theory and application of Two cavity Klystron Amplifier, Reflex Klystron oscillator, Traveling wave tube amplifier, Magnetron oscillator using Cylindrical, Linear, Coaxial Voltage tunable Magnetrons, Backward wave Crossed field amplifier and oscillator.

UNIT V   MICROWAVE MEASUREMENTS   9

Measuring Instruments : Principle of operation and application of VSWR meter, Power meter, Spectrum analyzer, Network analyzer, Measurement of Impedance, Frequency, Power, VSWR, Q- factor, Dielectric constant, Scattering coefficients, Attenuation, S-parameters.

                                                    TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course, students will be able to:
- Explain the active & passive microwave devices & components used in Microwavecommunication systems.
- Analyze the multi- port RF networks and RF transistor amplifiers.
- Generate Microwave signals and design microwave amplifiers.
- Measure and analyze Microwave signal and parameters.

TEXT BOOKS:
1. Reinhold Ludwig and Gene Bogdanov, "RF Circuit Design: Theory and Applications", PearsonEducation Inc., 2011

2. Robert E Colin, "Foundations for Microwave Engineering", John Wiley & Sons Inc, 2005

REFERENCES:
1. David M. Pozar, "Microwave Engineering", Wiley India (P) Ltd, New Delhi, 2008.

2. Thomas H Lee, "Planar Microwave Engineering: A Practical Guide to Theory, Measurements andCircuits", Cambridge University Press, 2004.

3. Mathew M Radmanesh, "RF and Microwave Electronics", Prentice Hall, 2000.

4. Annapurna Das and Sisir K Das, "Microwave Engineering", Tata Mc Graw Hill Publishing CompanyLtd, New Delhi, 2005.

PRINCIPAL
Idhaya Engineering College for Women
Vainarpalaym Road, CHINNASALEM-606∠∪
Kallakurichi Taluk, Villupuram District

EC6702   **OPTICAL COMMUNICATION AND NETWORKS**   **L T P C**
                                                                                          3 0 0 3

OBJECTIVES:
- To Facilitate the knowledge about optical fiber sources and transmission techniques
- To Enrich the idea of optical fiber networks algorithm such as SONET/SDH and optical CDMA.
- To Explore the trends of optical fiber measurement systems.

UNIT I   INTRODUCTION TO OPTICAL FIBERS   9
Evolution of fiber optic system- Element of an Optical Fiber Transmission link-- Total internal reflection-Acceptance angle –Numerical aperture — Skew rays Ray Optics-Optical Fiber Modes and Configurations -Mode theory of Circular Wave guides- Overview of Modes-Key Modal concepts- Linearly Polarized Modes -Single Mode Fibers-Graded Index fiber structure.

UNIT II   SIGNAL DEGRADATION OPTICAL FIBERS   9
Attenuation - Absorption losses, Scattering losses, Bending Losses, Core and Cladding losses, Signal Distortion in Optical Wave guides-Information Capacity determination -Group Delay-Material Dispersion, Wave guide Dispersion, Signal distortion in SM fibers-Polarization Mode dispersion, Intermodal dispersion, Pulse Broadening in GI fibers-Mode Coupling -Design Optimization of SM fibers-RI profile and cut-off wavelength.

UNIT III   FIBER OPTICAL SOURCES AND COUPLING   9
Direct and indirect Band gap materials-LED structures -Light source materials -Quantum efficiency and LED power, Modulation of a LED, lasers Diodes-Modes and Threshold condition -Rate equations
-External Quantum efficiency -Resonant frequencies -Laser Diodes, Temperature effects, Introduction to Quantum laser, Fiber amplifiers-Power Launching and coupling, Lencing schemes, Fiber -to- Fiber joints, Fiber splicing-Signal to Noise ratio , Detector response time.

UNIT IV   FIBER OPTIC RECEIVER AND MEASUREMENTS   9
Fundamental receiver operation, Pre amplifiers, Error sources – Receiver Configuration– Probability of Error – Quantum limit.Fiber Attenuation measurements- Dispersion measurements – Fiber Refractive index profile measurements – Fiber cut- off Wave length Measurements – Fiber Numerical Aperture Measurements – Fiber diameter measurements.

UNIT V OPTICAL NETWORKS AND SYSTEM TRANSMISSION   9
Basic Networks – SONET / SDH – Broadcast – and –select WDM Networks –Wavelength Routed Networks – Non linear effects on Network performance —Link Power budget -Rise time budget- Noise Effects on System Performance-Operational Principles of WDM Performance of WDM + EDFA system – Solutions – Optical CDMA – Ultra High Capacity Networks.
                                                                            TOTAL: 45 PERIODS
OUTCOMES:
    Upon completion of the course, students will be able to:
- Discuss the various optical fiber modes, configurations and various signal degradation factors associated with optical fiber.
- Explain the various optical sources and optical detectors and their use in the optical communication system.
- Analyze the digital transmission and its associated parameters on system performance.

TEXT BOOKS:
1. Gerd Keiser, "Optical Fiber Communication" Mc Graw -Hill International, 4th Edition., 2010.

2. John M. Senior , "Optical Fiber Communication", Second Edition, Pearson Education, 2007.

REFERENCES:
1. Ramaswami, Sivarajan and Sasaki "Optical Networks", Morgan Kaufmann, 2009.

2. J.Senior, "Optical Communication, Principles and Practice", Prentice Hall of India, 3rd Edition,2008.

3. J.Gower, "Optical Communication System", Prentice Hall of India, 2001

IT6005	DIGITAL IMAGE PROCESSING	L T P C
		3 0 0 3

OBJECTIVES:

The student should be made to:

- Learn digital image fundamentals.
- Be exposed to simple image processing techniques.
- Be familiar with image compression and segmentation techniques.
- Learn to represent image in form of features.

UNIT I   DIGITAL IMAGE FUNDAMENTALS   8

Introduction – Origin – Steps in Digital Image Processing – Components – Elements of Visual Perception – Image Sensing and Acquisition – Image Sampling and Quantization – Relationships between pixels - color models.

UNIT II   IMAGE ENHANCEMENT   10

Spatial Domain: Gray level transformations – Histogram processing – Basics of Spatial Filtering– Smoothing and Sharpening Spatial Filtering – **Frequency Domain:** Introduction to Fourier Transform

– Smoothing and Sharpening frequency domain filters – Ideal, Butterworth and Gaussian filters.

UNIT III   IMAGE RESTORATION AND SEGMENTATION   9

Noise models – Mean Filters – Order Statistics – Adaptive filters – Band reject Filters – Band pass Filters – Notch Filters – Optimum Notch Filtering – Inverse Filtering – Wiener filtering **Segmentation:** Detection of Discontinuities–Edge Linking and Boundary detection – Region based segmentation- Morphological processing- erosion and dilation.

UNIT IV   WAVELETS AND IMAGE COMPRESSION   9

Wavelets – Subband coding - Multiresolution expansions - **Compression:** Fundamentals – Image Compression models – Error Free Compression – Variable Length Coding – Bit-Plane Coding – Lossless Predictive Coding – Lossy Compression – Lossy Predictive Coding – CompressionStandards.

UNIT V   IMAGE REPRESENTATION AND RECOGNITION   9

Boundary representation – Chain Code – Polygonal approximation, signature, boundary segments –Boundary description – Shape number – Fourier Descriptor, moments- Regional Descriptors – Topological feature, Texture - Patterns and Pattern classes - Recognition based on matching.

TOTAL: 45 PERIODS

OUTCOMES:

Upon successful completion of this course, students will be able to:

- Discuss digital image fundamentals.
- Apply image enhancement and restoration techniques.
- Use image compression and segmentation Techniques.
- Represent features of images.

TEXT BOOK:

1. Rafael C. Gonzales, Richard E. Woods, "Digital Image Processing", Third Edition, PearsonEducation, 2010.

REFERENCES:

1. Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins, "Digital Image Processing UsingMATLAB", Third Edition Tata Mc Graw Hill Pvt. Ltd., 2011.

2. Anil Jain K. "Fundamentals of Digital Image Processing", PHI Learning Pvt. Ltd., 2011.

3. Willliam K Pratt, "Digital Image Processing", John Willey, 2002.

4. Malay K. Pakhira, "Digital Image Processing and Pattern Recognition", First Edition, PHI LearningPvt. Ltd., 2011.

5. http://eeweb.poly.edu/~onur/lectures/lectures.html.

   http://www.caen.uiowa.edu/~dip/LECTURE/lecture.html

EC6009   **ADVANCED COMPUTER ARCHITECTURE**   **L T P C**
                                                                                       3 0 0 3

OBJECTIVES:
The student should be made to:
- Understand the micro-architectural design of processors
- Learn about the various techniques used to obtain performance improvement and powersavings in current processors

UNIT I   FUNDAMENTALS OF COMPUTER DESIGN   9
Review of Fundamentals of CPU, Memory and IO – Trends in technology, power, energy and cost, Dependability - Performance Evaluation

UNIT II   INSTRUCTION LEVEL PARALLELISM   9
ILP concepts – Pipelining overview - Compiler Techniques for Exposing ILP – Dynamic Branch Prediction – Dynamic Scheduling – Multiple instruction Issue – Hardware Based Speculation – Static scheduling - Multi-threading - Limitations of ILP – Case Studies.

UNIT III   DATA-LEVEL PARALLELISM   9
Vector architecture – SIMD extensions – Graphics Processing units – Loop level parallelism.

UNIT IV   THREAD LEVEL PARALLELISM   9
Symmetric and Distributed Shared Memory Architectures – Performance Issues –Synchronization –Models of Memory Consistency – Case studies: Intel i7 Processor, SMT & CMP Processors

UNIT V   MEMORY AND I/O   9
Cache Performance – Reducing Cache Miss Penalty and Miss Rate – Reducing Hit Time – Main Memory and Performance – Memory Technology. Types of Storage Devices – Buses – RAID – Reliability, Availability and Dependability – I/O Performance Measures.

                                                                          TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Evaluate performance of different architectures with respect to various parameters
- Analyze performance of different ILP techniques
- Identify cache and memory related issues in multi-processors

TEXT BOOK:

1. John L Hennessey and David A Patterson, "Computer Architecture A Quantitative Approach",Morgan Kaufmann/ Elsevier, Fifth Edition, 2012.

REFERENCES:

1. Kai Hwang and Faye Briggs, "Computer Architecture and Parallel Processing", Mc Graw-HillInternational Edition, 2000.

2. Sima D, Fountain T and Kacsuk P, "Advanced Computer Architectures: A Design SpaceApproach", Addison Wesley, 2000.

PRINCIPAL
idhaya Engineering College for Women
Nainarpalaym Road, CHINNASALEM-606201
kallakurichi Taluk, Villupuram District

EC6016   **OPTO ELECTRONIC DEVICES**   **L T P C**
                                                                                    3 0 0 3

OBJECTIVES:
- To understand the basics of solid state physics.
- To understand the basics of display devices.
- To understand the optical detection devices.
- To understand the design of optoelectronic integrated circuits.

UNIT I   ELEMENTS OF LIGHT AND SOLID STATE PHYSICS   **9**
Wave nature of light, Polarization, Interference, Diffraction, Light Source, review of Quantum Mechanical concept, Review of Solid State Physics, Review of Semiconductor Physics and Semiconductor Junction Device.

UNIT II   DISPLAY DEVICES AND LASERS   **9**
Introduction, Photo Luminescence, Cathode Luminescence, Electro Luminescence, Injection Luminescence, Injection Luminescence, LED, Plasma Display, Liquid Crystal Displays, Numeric Displays, Laser Emission, Absorption, Radiation, Population Inversion, Optical Feedback, Threshold condition, Laser Modes, Classes of Lasers,Mode Locking, laser applications.

UNIT III   OPTICAL DETECTION DEVICES   **9**
Photo detector, Thermal detector, Photo Devices, Photo Conductors, Photo diodes ,Detector Performance.

UNIT IV   OPTOELECTRONIC MODULATOR   **9**
Introduction, Analog and Digital Modulation, Electro-optic modulators, Magneto Optic Devices, Acoustoptic devices, Optical, Switching and Logic Devices.

UNIT V   OPTOELECTRONIC INTEGRATED CIRCUITS   **9**
Introduction, hybrid and Monolithic Integration, Application of Opto Electronic Integrated Circuits, Integrated transmitters and Receivers, Guided wave devices.

                                                                          TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students will be able to
- To design display devices.
- To design optoelectronic detection devices and modulators.
- To design optoelectronic integrated circuits.

TEXTBOOKS:
1. Pallab Bhattacharya "Semiconductor Opto Electronic Devices", Prentice Hall of India Pvt., Ltd.,New Delhi, 2006.

2. Jasprit Singh, "Opto Electronics – As Introduction to Materials and Devices", Mc Graw-HillInternational Edition, 1998

REFERENCES:
1. S C Gupta, Opto Electronic Devices and Systems, Prentice Hal of India, 2005.

2. J. Wilson and J.Haukes, "Opto Electronics – An Introduction", Prentice Hall, 1995

PRINCIPAL
idhaya Engineering College for Women
Vainarpalaym Road, CHINNASALEM-60620
kallakurichi Taluk, Villupuram District

EC6801   **WIRELESS COMMUNICATION**   **L T P C**
                                                                            3 0 0 3

OBJECTIVES:
The student should be made to:
- Know the characteristic of wireless channel
- Learn the various cellular architectures
- Understand the concepts behind various digital signaling schemes for fading channels
- Be familiar the various multipath mitigation techniques
- Understand the various multiple antenna systems

UNIT I   WIRELESS CHANNELS   **9**
Large scale path loss – Path loss models: Free Space and Two-Ray models -Link Budget design –Small scale fading- Parameters of mobile multipath channels – Time dispersion parameters- Coherence bandwidth – Doppler spread & Coherence time, Fading due to Multipath time delay spread – flat fading – frequency selective fading – Fading due to Doppler spread – fast fading – slow fading.

UNIT II   CELLULAR ARCHITECTURE   **9**
Multiple Access techniques - FDMA, TDMA, CDMA – Capacity calculations–Cellular concept- Frequency reuse - channel assignment- hand off- interference & system capacity- trunking & grade of service – Coverage and capacity improvement.

UNIT III   DIGITAL SIGNALING FOR FADING CHANNELS   **9**
Structure of a wireless communication link, Principles of Offset-QPSK, p/4-DQPSK, Minimum Shift Keying, Gaussian Minimum Shift Keying, Error performance in fading channels, OFDM principle –Cyclic prefix, Windowing, PAPR.

UNIT IV   MULTIPATH MITIGATION TECHNIQUES   **9**
Equalisation — Adaptive equalization, Linear and Non-Linear equalization, Zero forcing and LMS Algorithms. Diversity – Micro and Macrodiversity, Diversity combining techniques, Error probability in fading channels with diversity reception, Rake receiver,

UNIT V   MULTIPLE ANTENNA TECHNIQUES   **9**
MIMO systems — spatial multiplexing -System model -Pre-coding - Beam forming - transmitter diversity, receiver diversity- Channel state information-capacity in fading and non-fading channels.

                                                                        TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Characterize wireless channels
- Design and implement various signaling schemes forfading channels
- Design a cellular system
- Compare multipath mitigation techniques and analyze their performance
- Design and implement systems with transmit/receive diversity andMIMO systems and analyze their performance

TEXTBOOKS:

1. Rappaport,T.S., "Wireless communications", Second Edition, Pearson Education, 2010.
2. Andreas.F. Molisch, "Wireless Communications", John Wiley – India, 2006.

REFERENCES:

1. David Tse and Pramod Viswanath, "Fundamentals of Wireless Communication",Cambridge University Press, 2005.
2. Upena Dalal, " Wireless Communication", Oxford University Press, 2009.
3. Van Nee, R. and Ramji Prasad, "OFDM for wireless multimedia communications", ArtechHouse, 2000.

EC6802   **WIRELESS NETWORKS**   **L T P C**
                                                                                  3 0 0 3

OBJECTIVES:

- To study about Wireless networks, protocol stack and standards.
- To study about fundamentals of 3G Services, its protocols and applications.
- To study about evolution of 4G Networks, its architecture and applications.

UNIT I   WIRELESS LAN   **9**
Introduction-WLAN technologies: Infrared, UHF narrowband, spread spectrum -IEEE802.11: System architecture, protocol architecture, physical layer, MAC layer, 802.11b, 802.11a – Hiper LAN: WATM, BRAN, HiperLAN2 — Bluetooth: Architecture, Radio Layer, Baseband layer, Link manager Protocol, security - IEEE802.16-WIMAX: Physical layer, MAC, Spectrum allocation for WIMAX

UNIT II   MOBILE NETWORK LAYER   **9**
Introduction - Mobile IP: IP packet delivery, Agent discovery, tunneling and encapsulation, IPV6- Network layer in the internet- Mobile IP session initiation protocol - mobile ad-hoc network: Routing, Destination Sequence distance vector, Dynamic source routing

UNIT III   MOBILE TRANSPORT LAYER   **9**
TCP enhancements for wireless protocols - Traditional TCP: Congestion control, fast retransmit/fast recovery, Implications of mobility - Classical TCP improvements: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective retransmission, Transaction oriented TCP - TCP over 3G wireless networks.

UNIT IV   WIRELESS WIDE AREA NETWORK   **9**
Overview of UTMS Terrestrial Radio access network-UMTS Core network Architecture: 3G-MSC, 3G- SGSN, 3G-GGSN, SMS-GMSC/SMS-IWMSC, Firewall, DNS/DHCP-High speed Downlink packet access (HSDPA)- LTE network architecture and protocol.

UNIT V   4G NETWORKS   **9**
Introduction — 4G vision — 4G features and challenges - Applications of 4G — 4G Technologies: Multicarrier Modulation, Smart antenna techniques, OFDM-MIMO systems, Adaptive Modulation and coding with time slot scheduler, Cognitive Radio.

                                                                                  TOTAL: 45 PERIODS

OUTCOMES:
  Upon completion of the course, the students will be able to
  - Conversant with the latest 3G/4G and WiMAX networks and its architecture.
  - Design and implement wireless network environment for any application using latest wirelessprotocols and standards.
  - Implement different type of applications for smart phones and mobile devices with latest networkstrategies.

TEXT BOOKS:

1. Jochen Schiller, "Mobile Communications", Second Edition, Pearson Education 2012.(Unit I,II,III)
2. Vijay Garg, "Wireless Communications and networking", First Edition, Elsevier 2007.(Unit IV,V)

REFERENCES:

1. Erik Dahlman, Stefan Parkvall, Johan Skold and Per Beming, "3G Evolution HSPA and LTE forMobile Broadband", Second Edition, Academic Press, 2008.
2. Anurag Kumar, D.Manjunath, Joy kuri, "Wireless Networking", First Edition, Elsevier 2011.
3. Simon Haykin , Michael Moher, David Koilpillai, "Modern Wireless Communications",First Edition, Pearson Education 2013

PRINCIPAL
idhaya Engineering College for Wome
Nainarpalaym Road. CHINNASALEM-60626
kallakurichi Taluk Villupuram District

MONITORING THE WASTE WATER TREATMENT PLANT USING IMAGE PROCESSING BASED ON ARDUINO

A PROJECT REPORT

Submitted by

ANJALI DEVI S   621116106004

JEYA PRIYANKA S   621116106007

PREETHA K   621116106018

In partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

ANNA UNIVERSITY : CHENNAI 600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report "**MONITORING THE WASTEWATER TREATMENT PLANT USING IMAGE PROCESSING BASEDON ARDUINO**" is the bonafide work of "**ANJALI DEVI S, JEYA PRIYANKA S, PREETHA K**" who carried out the project work under my supervision

SIGNATURE

Dr. S.A. AmuthaJeevakumari, Ph.D

HEAD OF THE DEPARTMENT

Professor,
Department of Electronics &
Communication Engineering,
IdhayaEngg. College for Women,
Chinnasalem – 606 201.

SIGNATURE

Dr. Sr. A. Jenitta, Ph.D

SUPERVISOR

Professor,
Department of Electronics &
Communication Engineering,
IdhayaEngg.College for Women,
Chinnasalem – 606 201.

Submitted for the Project Work viva voce held on 23.09.2020

INTERNAL EXAMINER(1)

INTERNAL EXAMINER(2)

ii

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Image processing and analysis is useful to monitor the Activated Sludge (AS) wastewater treatment plants based on the morphology of microbial aggregates: flocs and filamentous bacteria. Phase-contrast microscopy is used to observe filamentous bacteria in the AS samples at lower objective magnification with improved visibility of details. However, segmentation of the phase-contrast images faces inherent difficulties caused by the artifacts associated with the microscopy, such as halos and shade-off. This project is comprised mainly of three tasks: robust segmentation of phase-contrast images for filamentous bacteria, identification of novel image analysis parameters for morphology of the bacteria, Total Suspended Solids and the use of the proposed parameters to model Sludge Volume Index (SVI). Thus SVI becomes most important physical parameter which employ to monitor the operation of an AS wastewater treatment plant. Hence it is absorbed that image processing plays major role in monitoring Activated Sludge waste water treatment plants and implemented in MATLAB software and embedded with arduino processing hardware. The detected particles are displayed in the Liquid crystal display (LCD) and successfully communicated to the user through Global System for Mobile Communications (GSM).

iii

INTELLIGENT AND SMART MATTRESS FOR BEDRIDDEN USING CLOUD COMPUTING

A PROJECT REPORT

Submitted by

ABARNA.K	**621116106001**
ANITHA.A	**621116106003**
MERLIN JOYANA.G	**621116106012**

in partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

in

ELECTRONICS AND COMMUNICATION ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY: CHENNAI 600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI-DT

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project titled **"INTELLIGENT AND SMART MATTRESS FOR BEDRIDDEN USING CLOUD COMPUTING"** is the bonafide work of **"P.ABARNA, A.ANITHA, G.MERLIN JOYANA"** who carried out the project under my supervision.
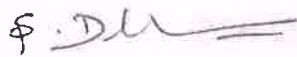
SIGNATURE	**SIGNATURE**
Dr.S.A.AmuthaJeevakumari,Ph.D.,	**Ms.P.Poovizhi,M.E.,**
HEAD OF THE DEPARTMENT	**SUPERVISOR**
Professor/ECE,	Associate Professor/ECE,
Idhaya Engineering College	Idhaya Engineering College
For Women,	For Women,
Chinnasalem-606 201.	Chinnasalem-606 201.

Submitted for the Project work vivoc held on 23.09.2020

INTERNAL EXAMINER(1)	**INTERNAL EXAMINER(2)**

ii

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Health plays a vital role in our daily life and it is necessary to do the daily work properly. In rural hospital, the facilities for health caring are very limited.The poor quality of health management enables health care system. Everyone should get the knowledge of own health as early and early as possible. The increased use of embedded and smart devices in the area of health has caused great impact on the world.

In our project, we present a design model of bed used for bedridden patients, paralysis, individuals with impaired mobility and the elderly. The bed consists of smart mattress, an automatic bed lift control system, a patient monitoring system. The smart mattress which can heat the bed according to the patient body temperature. The bed can change the patient's position in left or right tilt by lifting the left or right side of the bed automatically and the patient monitoring system such as the heart beat rate and the body temperature level of the patient are sensed using respective sensors and display it in the LCD display and send the health status of the patient to the doctor through cloud computing. The sensors, LCD display, and smart mattress are interfaced with the pic microcontroller.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

DESIGN AND IMPLEMENTATIONOF RSSI FOR WIRELESS SENSOR NETWORK THROUGH HYBRID CLASSIFIERS

A PROJECT REPORT

Submitted by

P.MAHESWARI	**621116106011**
K.RAMYA	**621116106021**
S.SELSIA	**621116106023**
E.SUBASHINI	**621116106026**

Inpartialfulfillmentfortheawardofthedegree

of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

ANNA UNIVERSITY:CHENNAI 600025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201.KALLAKURICHI DT.

BONAFIDE CERTIFICATE

Certified that this project report "**DESIGN AND IMPLEMENTATION OF RSSI FOR WIRELESS SENSOR NETWORK THROUGH HYBRID CLASSIFIERS**" is the bonafide work of "**MAHESWARI.P, RAMYA.K, SELSIA.S,SUBASHINI.E**" who carried out the project work under my supervision

SIGNATURE   SIGNATURE

Dr.S.A.Amutha Jeevakumari, M.E Ph.D   **Mrs.S.Dhanalakshmi.M.E**
HEAD OF THE DEPARTMENT   **SUPERVISOR**

Professor,   Professor,

Department of Electronics &   Department of Electronics &

Communication Engineering,   Communication Engineering,

IdhayaEngg. College for Women,   IdhayaEngg.College for women,

Chinnasalem – 606 201.   Chinnasalem – 606 201.

Submitted for the Project Work viva voce held on 23.09.2020

INTERNAL EXAMINER(1)   INTERNAL EXAMINER(2)

ii

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

AUTOMATED INTIMATION TO AMBULANCE FOR EMERGENCY MEDICAL SERVICE USING INTERNET OF THINGS
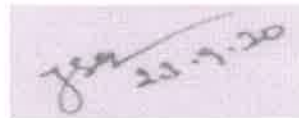
A PROJECT REPORT

Submitted by

HANNAH.A   621116106006

KAVIYA.R   621116106008

ANANDAESWARI.J   621116106301

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

ELECTRONICS AND COMMUNICATION ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY: CHENNAI-600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY: CHENNAI-600025

BONAFIDE CERTIFICATE

Certified that this project report **"WIRELESS BASED BOREWELL CHILD RESCUE SYSTEM USING ROBOT"** is the bonafide work of **"A.HANNAH,R.KAVIYA,J.ANANDAESWARI"** who carried out the project under my supervision

SIGNATURE

Dr.S.A.AMUTHA JEEVAKUMARI,M.E.,Ph.D.,

HEAD OFTHEDEPARTMENT

Professor/ECE,

Idhaya engineering college

for women,

Chinnasalem-606201.

SIGNATURE

Mr.M.MAHESH,M.Tech.,

SUPERVISOR

Assistant Professor/ECE,

Idhaya engineering college

for women,

Chinnasalem-606201.

Submitted for the Project work viva voce held on 23.9 2020

INTERNALEXAMINER(1)

INTERNALEXAMINER(2)

ii
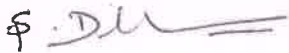
AUTOMATED SMART VEHICLE MANAGEMENT SYSTEM TO PREVENT ACCIDENT

A PROJECT REPORT

Submitted by

LEELA ROSLIN. J	621116106901
SIVASANKARI.G	621116106025
SUVITHA.V	621116106027

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY: CHENNAI-600 025

APRIL 2020

i

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY: CHENNAI-600 025

BONAFIDE CERTIFICATE

Certified that this project report **"AUTOMATED SMART VEHICLE MANAGEMENT SYSTEM TO PREVENT ACCIDENT"** is the bonafide work of **"J. LEELA ROSLIN, G. SIVASANKARI, V. SUVITHA"** who carried out the project under my supervision.

SIGNATURE

Dr.S.A.AMUTHAJEEVAKUMARI,Ph.D
HEAD OF THE DEPARTMENT
Professor
Department of Electronics &
Communication Engineering
Idhaya Engineering College
for Women
Chinnasalem-606 201.

SIGNATURE

Mrs.K.SOLAIYAMMAL, M.E
SUPERVISOR
Assistant Professor
Department of Electronics &
Communication Engineering
Idhaya Engineering College
for Women
Chinnasalem-606 201.

Submitted for the project work viva voce held on 23. 09. 2020

INTERNAL EXAMINER (1)

INTERNAL EXAMINER (2)

ii
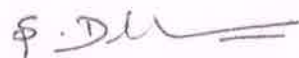
Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

In today's fast and crowded world, road accident is a major concern. The highest fatal traffic accidents occur on the curved roads at night time. Also the glare problem due to focus of headlight is dangerous. Even the improper indications given to the nearby vehicle increases chances of fatal accidents. These facts indicate the importance of advancement in conventional vehicle systems.

Nowadays we hear almost every day about fatal road accidents. Major causes for road accidents includes decreased visibility of driver on curved roads during night, glare of headlight, incorrect indication to the nearby vehicles, etc.

In order to overcome the problems we have proposed a automated smart vehicle management system consisting of automatic headlight intensity control, adaptive steerable headlight system, anti-collision system, auto indicator-off system and vehicle to vehicle communication.

iv

WIRELESS SENSOR NETWORK AND CLOUD SERVER BASED ENVIRONMENTAL MONITORING SYSTEM USING IOT

A PROJECT REPORT

Submitted by

AJITHA.P	621116106002
KAYALVIZHI.P	621116106009
NAGADHARSHINI.R	621116106014

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

ELECTRONICS AND COMMUNICATION ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY : CHENNAI-600 025

APRIL 2020

i

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY : CHENNAI-600 025

BONAFIDE CERTIFICATE

Certified that this project report" **WIRELESS SENSOR NETWORK AND CLOUD SERVER BASED ENVIRONMENTAL MONITORING SYSTEM USING IOT** "is the bonafide work of"**P.AJITHA, P.KAYALVIZHI, R.NAGADHARSHINI**"who carried out the project under my supervision.

SIGNATURE

Dr. S.A. Amutha Jeeva kumari, Ph.D

HEAD OF THE DEPARTMENT

Professor/ECE,

Idhaya engineering college

for women,

Chinnasalem-606 201.
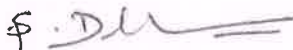
SIGNATURE

Ms. V. Dhivya Priya, M.Tech

SUPERVISOR

Assistant Professor/ECE,

Idhaya engineering college

for women,

Chinnasalem-606 201.

Submitted for the Project work viva voce held on 23/09/2020

INTERNAL EXAMINER (1)

INTERNAL EXAMINER (2)

ii

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

In this paper,we present and describe the objectives of environmental monitoring is different in different situations,The project aims at building a system which can be used on universally at any scale to monitor the parameters in each environmental to find risks of human and wildlife, scope to restrict the emission of gases.sensors collects all the real-time data from environment and this real-time data is fetched by the web server and display it. User can access this data from anywhere through Internet. Wireless sensor networks (WSN) are well suited for long-term environmental data acquisition for IOT representation.In this project we have proposed a system by which only authorized people can detect the forest fire using android application.We can also make the system compatible with more than one wireless technology.

iv

AUTOMATED INTIMATION TO AMBULANNCE

FOR EMERGENCY MEDICAL SERVICE USING

INTERNET OF THINGS

A PROJECT REPORT

Submitted by

ARUNA.V   621116106005

NAVEENA.A   621116106015

YASMIN.M   621116106028

in partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

in

ELECTRONICS AND COMMUNICATION ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY: CHENNAI-600 025

APRIL 2020

i

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY: CHENNAI-600 025

BONAFIDE CERTIFICATE

Certified that this project report **"AUTOMATED INTIMATION TO AMBULANCE FOR EMERGENCY MEDICAL SERVICE USING INTERNET OF THINGS"** is the bonafide work of **"V.ARUNA, A.NAVEENA, M.YASMIN"** who carried out the project under my supervision.

SIGNATURE

Dr. S. A. AMUTHA JEEVA KUMARI, M.E., Ph.D.,

HEAD OF THE DEPARTMENT

Professor/ECE,

Idhaya Engineering College For Women,

Chinnasalem - 606 201.

SIGNATURE

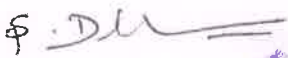**Ms A .RUBY ROSELIN, M.E.,**

SUPERVISOR

Assistant Professor/ECE,

Idhaya Engineering College For Women,

Chinnasalem-606 201.

Submitted for the Project work viva voice held on 23.09.2020

INTERNAL EXAMINER 1

INTERNAL EXAMINER 2

ii

ABSTRACT

The aim of our project is providing early detection of accidents and communicating the information immediately to the emergency, response on time to provide quick assistance for the injured person.

When the rider met with an accident and hits the ground the vibration sensor which is embedded in the ECU sense the vibration frequency and transfer the value to the raspberry pi module that is interfaced to it. While vibration threshold frequency exceeds the programmed maximum limit, controller extracts GPS data from the GPS module and the message with all the necessary information is sent quickly to the registered emergency contact of the rider.

This system assures to provide immediate assistance to the victim of the accident. The result gives exact location of the accident.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

A SOURCE- LOCATION PRIVACY IN WIRELESS SENSOR NETWORKS USING MULTI-SINKS

A PROJECT REPORT

Submitted by

M.MONISHA   621116106013

L.RAJ PRIYA   621116106020

L.SHAHIDHA   621116106024

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

ELECTRONICS AND COMMUNICATION ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN, CHINNASALEM

ANNA UNIVERSITY::CHENNAI 600 025

APRIL 2020

i

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report **"A SOURCE-LOCATION PRIVACY IN WIRELESS SENSOR NETWORKS USING MULTI-SINKS"** is the bonafide work of " **M.MONISHA**, **L.RAJPRIYA**, **L.SHAHIDHA** " who carried out the project under my supervision.

SIGNATURE

Dr.S.A.AMUTHA JEEVAKUMARI,M.E.,Ph.D.,
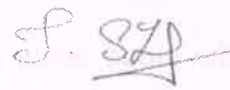
HEAD OF THE DEPARTMENT

Professor/ECE,

Idhaya Engineering College

For Women,

Chinnasalem-606 201.

SIGNATURE

Ms.J.SUMITHA JOSPHINE,M.E.,

SUPERVISOR

Assistant Professor/ECE,

Idhaya Engineering College

for Women,

Chinnasalem-606 201.

Submitted for the Project work viva voce held on **23 – 9 - 2020**

INTERNAL EXAMINER (1)

INTERNAL EXAMINER (2)

ii

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Source location privacy is a major problem in wireless sensor networks (WSNs). WSNs are usually deployed in random areas with no protection. The source location reveals valuable information about targets. If an adversary locates the source node by analyzing the traffic mode, a target can be easily attacked. In this paper, a scheme based on the cloud using multi-sinks (CPSLP) is proposed to address the issue of source location privacy. The authors propose a scheme that changes packet destinations randomly in each transmission. In addition, multiple sinks are adopted to create many routing paths. The introduction of an intermediate node renders the routing path more random and flexible. Then, a cloud-shaped fake hotspot is created to add fake packets into the WSN to confuse the adversary and provide a comprehensive privacy location. Each valuable packet is routed through a path that is quite difficult for the hotspot-locating adversary to find directly. Simulation results illustrate that the CPSLP scheme can prevent adversarial capture and maintain a high level of privacy protection at the same time. The energy consumption in this scheme exerts limited influence on the network lifetime compared with a cloud-based scheme and an all-direction random routing algorithm scheme.

DEPARTMENT OF INFORMATION TECHNOLOGY

EC8394   **ANALOG AND DIGITAL COMMUNICATION**   L T P C
                                                                                          3 0 0 3

OBJECTIVES:
The student should be made to:
- Understand analog and digital communication techniques.
- Learn data and pulse communication techniques.
- Be familiarized with source and Error control coding.
- Gain knowledge on multi-user radio communication.

UNIT I   ANALOG COMMUNICATION   9
Introduction to Communication Systems - Modulation – Types - Need for Modulation. Theory of Amplitude Modulation -
Evolution and Description of SSB Techniques - Theory of Frequency and Phase Modulation – Comparison of Analog
Communication Systems (AM – FM – PM).

UNIT II   PULSE AND DATA COMMUNICATION   9
Pulse Communication: Pulse Amplitude Modulation (PAM) – Pulse Time Modulation (PTM) – Pulse code Modulation (PCM) -
Comparison of various Pulse Communication System (PAM – PTM – PCM).

Data Communication: History of Data Communication - Standards Organizations for Data Communication- Data Communication
Circuits - Data Communication Codes - Data communication Hardware - serial and parallel interfaces.

UNIT III   DIGITAL COMMUNICATION   9
Amplitude Shift Keying (ASK) – Frequency Shift Keying (FSK)–Phase Shift Keying (PSK) – BPSK – QPSK – Quadrature
Amplitude Modulation (QAM) – 8 QAM – 16 QAM – Bandwidth Efficiency– Comparison of various Digital
Communication System (ASK – FSK – PSK – QAM).

UNIT IV   SOURCE AND ERROR CONTROL CODING   9
Entropy, Source encoding theorem, Shannon fano coding, Huffman coding, mutual information, channel capacity, Error Control
Coding, linear block codes, cyclic codes - ARQ Techniques.

UNIT V   MULTI-USER RADIO COMMUNICATION   9
Global System for Mobile Communications (GSM) - Code division multiple access (CDMA) – Cellular Concept and Frequency
Reuse - Channel Assignment and Handover Techniques - Overview of Multiple Access Schemes - Satellite Communication -
Bluetooth.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Apply analog and digital communication techniques.
- Use data and pulse communication techniques.
- Analyze Source and Error control coding.
- Utilize multi-user radio communication.

TEXT BOOK:
1.   Wayne Tomasi, ―Advanced Electronic Communication Systems‖, 6th Edition, Pearson Education,2009.

REFERENCES:
1.   Simon Haykin, ―Communication Systems‖, 4th Edition, John Wiley & Sons, 2004
2.   Rappaport T.S, "Wireless Communications: Principles and Practice", 2nd Edition, PearsonEducation, 2007
3.   H.Taub, D L Schilling and G Saha, ―Principles of Communication‖, 3rd Edition, Pearson Education,2007.
4.   B. P.Lathi, ―Modern   Analog   and   Digital   Communication   Systems‖,   3rd Edition, Oxford
      University Press, 2007.
5.   Blake, ―Electronic Communication Systems‖, Thomson Delmar Publications, 2002.
6.   Martin S.Roden, ―Analog and Digital Communication System‖, 3 rd Edition, Prentice Hall of India,2002.
7.   B.Sklar, ―Digital   Communication   Fundamentals   and   Applications‖   2nd   Edition
      Pearson Education 2007.

भारत संचार निगम लिमिटेड

(भारत सरकार का उपक्रम)

BHARAT SANCHAR NIGAM LIMITED

(A Government of India Enterprise)

Office of the General Manager, Cuddalore - 607001.

Certificate no : 221

COURSE CERTIFICATE

This is to certify that Mr / Miss ......T. INFANT DAICY.........

Studying .....B.TECH - IT II nd year.................................

IDHAYA ENGG COLLEGE FOR WOMEN CHINNASALEM.

has undergone training in " *Fundamentals of Telecom* " *held at Cuddalore*

From ....26-11-2019... *To* ...28-11-2019........................

TOPICS COVERED

Introduction to Telecom Network,
Over View of Broad Band Technologies,
M.D.F., Power Room, Visit to GSM BTS,
Modem, Connectivity,

Over View of Switching Systems,
BSNL Services & Tariff,
Switch Room OCB,MDF, PCM
CDMA BTS.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT

सहायक महा प्रबंधक (प्रशासन)
ASST. GENERAL MANAGER (ADMN)
का महा प्रबंध. बैलखल्ल. /O/o,GM,BSNL,
कडलूर / CUDDALORE-607 001.

Place : CUDDALORE

Date : 28-11-2019.

Connecting India

BHARAT SANCHAR NIGAM LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)

TRICHY TELECOM DISTRICT

BSN*Learning*

CERTIFICATE

This is to Certify Shri / Kum .... S.YAMUNASRI ....

a student of .... Idhaya Engineering College for Women, Chinnasalem ....
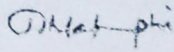
.... B Tech / IT- 2nd year ....

has undergone Vocational Training on Telecom Technologies in our

organization for 5 days From .... 03-12-2019 .... _to_ .... 07-12-2019 .... _and_

Completed the training successfully.

Place : Trichy
Date : 07-12-2019

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201, KALLAKURICHI DT

Assistant General Manager
(Administration)
Office of PGM, BSNL, Trichy.

◢◣ Gmail

karthikeyan vadivel <karthikeyaniecw@gmail.com>

Industrial Visit - Idhaya Engg college for women

Antuvan DS <ds_antuvan@vssc.gov.in>   Mon, Jul 8, 2019 at 10:25 AM
To: karthikeyan vadivel <karthikeyaniecw@gmail.com>

Dear Prof.Karthikeyan,

Nice to see your letter and the interest of your students undertaking a visit to VSSC/ISRO.

You are most welcome to come over here and we shall orange necessary pass for the visit.

I hope to be there with your team after return from Chandrayaan-II launch at Shriharikota.

Regads

DS Antuvan

Senior Scientist, VSSC/ISRO

[Quoted text hidden]

📄 **ISRO-IV.pdf**
927K

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

IDHAYA ENGINEERING COLLEGE FOR WOMEN

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.
An ISO 9001 : 2015 Certified Institution
(A Unit of the Franciscan Sisters of the Immaculate Heart of Mary Society, Pondicherry)

Date: 5|07|19

REF: IECW / ADM / IND.VISIT / 2019

To

Shri. D. S. Antuvan,
Senior Scientist,
Vikram Sarabhai Space Centre,
Thiruvananthapuram,
Kerala, India, Pin Code:695022

Sir,

Sub: Request for permission to visit your Research center – Final year CSE, EEE, ECE & IT students – Reg.

Greetings from Idhaya Engineering College for Women, Chinnasalem.

Idhaya Engineering College for Women is established and managed by Franciscan Sister of the Immaculate Heart of Mary Congregation to provide quality technical and professional education to the deserving women candidates. As a part of their regular curricular activities, every student has to undergo one industrial visit for every theory course offered. Our students of 4th year CSE, EEE, ECE & IT are very much interested to visit your center. So I am writing this letter to seek permission to visit preferably on 17th July, 2019.

Kindly give an orientation of the various facilities available at your center and we would be grateful for the same. We hope for your positive response at the earliest.

Total No. of students   :   89

No. of staff members accompanying   :   06

Thank you

Yours faithfully

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGINEERING COLLEGE FOR WOMEN
CHINNASALEM-606 201. VILLUPURAM DIST.

NextGen Solutions

Inspire the Next Generation

Accredited by

International Standards Accreditation Council (ISAC)

ISO
9001:2015

27/02/2020

From

    Mr.J.Jayantharam,

    Managing Director,

    NextGen Solutions,

    Cuddalore .

To

    The Head of the Department,

    Computer Science,

    Idhaya Engineering College for Women,

    Chinnasalem.

Respected Sir,

    This is for your confirmation that student of second year and third year of Computer Science and Information Technology has visited our company on 27.02.2020 (Thursday).And the students have learnt about Web Design and Android Development. On behalf of our Organization we wish them all the best for their future endeavour.

    Thanking You,

Yours Faithfully,

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

J.Jayantharam

NEXTGEN SOLUTIONS
CUDDALORE - 607 001

IT8501	WEB TECHNOLOGY	L	T	P	C
		3	0	0	3

OBJECTIVES:
- To understand about client-server communication and protocols used during communication.
- To design interactive web pages using Scripting languages.
- To learn server side programming using servlets and JSP.
- To develop web pages using XML/XSLT.

UNIT I   WEB SITE BASICS AND HTML   9

Web Essentials: Clients, Servers, and Communication. The Internet-Basic Internet Protocols -The World Wide Web-HTTP request message-response message-Web Clients Web Servers. Markup Languages: XHTML. An Introduction to HTML History-Versions-Basic XHTML Syntax and Semantics- Some Fundamental HTML Elements-Relative URLs-Lists-tables-Frames-Forms-HTML 5.

UNIT II   CSS AND CLIENT SIDE SCRIPTING   9

Style Sheets: CSS-Introduction to Cascading Style Sheets-Features-Core Syntax-Style Sheets and HTML- Style Rule Cascading and Inheritance-Text Properties-Box Model Normal Flow Box Layout- Beyond the Normal Flow-CSS3.0. Client-Side Programming: The JavaScript Language-History and Versions Introduction JavaScript in Perspective-Syntax-Variables and Data Types-Statements-Operators-Literals-Functions-Objects-Arrays-Built-in Objects-JavaScript Debuggers.

UNIT III   SERVER SIDE SCRIPTING   9

Host Objects: Browsers and the DOM-Introduction to the Document Object Model DOM History and Levels-Intrinsic Event Handling-Modifying Element Style-The Document Tree-DOM Event Handling- Accommodating Noncompliant Browsers Properties of window. Server-Side Programming: Java Servlets- Architecture -Overview-A Servlet-Generating Dynamic Content-Life Cycle- Parameter Data-Sessions-Cookies-URL Rewriting-Other Capabilities-Data Storage Servlets and Concurrency- Databases and Java Servlets.

UNIT IV   JSP AND XML   9

Separating Programming and Presentation: JSP Technology Introduction-JSP and Servlets-Running JSP Applications Basic JSP-JavaBeans Classes and JSP-Tag Libraries and Files-Support for the Model-View-Controller Paradigm- Databases and JSP. Representing Web Data: XML-Documents and Vocabularies-Versions and Declaration-Namespaces- DOM based XML processing Event-oriented Parsing: SAX-Transforming XML Documents-Selecting XML Data: XPATH-Template based Transformations: XSLT-Displaying XML Documents in Browsers.

UNIT V   AJAX AND WEB SERVICES   9

AJAX: Ajax Client Server Architecture-XML Http Request Object-Call Back Methods. Web Services: JAX-RPC-Concepts-Writing a Java Web Service-Writing a Java Web Service Client-Describing Web Services: WSDL- Representing Data Types: XML Schema-Communicating Object Data: SOAP Related Technologies-Software Installation-Storing Java Objects as Files.

TOTAL   45   PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Design simple web pages using markup languages like HTML and XHTML.
- Create dynamic web pages using DHTML and java script that is easy to navigate and use.
- Program server side web pages that have to process request from client side web pages.
- Represent web data using XML and develop web pages using JSP.
- Understand various web services and how these web services interact.

TEXT BOOK:
1.   Jeffrey C. Jackson, "Web Technologies--A Computer Science Perspective", PearsonEducation, 2006.

REFERENCES
1.   Robert. W. Sebesta, "Programming the World Wide Web", Fourth Edition,Pearson Education, 2007 .
2.   Deitel, Deitel, Goldberg, "Internet & World Wide Web How To Program", Third Edition, Pearson Education, 2006.
3.   Marty Hall and Larry Brown,‖ Core Web Programming‖ Second Edition, Volume I and II, Pearson Education, 2001.
4.   Bates, ―Developing Web Applications‖, Wiley, 2006.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

REF: IECW / CSE, EEE, ECE & IT / IV / 2019

Date: 25.07.2019

Department of CSE, EEE, ECE and IT

Place: Kerala

Days: (17th to 19th July 2019)

Industrial Visit and Educational tour Report

IECW organized a 3 days Industrial Visit and Educational Tour to ISRO, Trivandrum, from 17.07.2019 to 19.07.2019 for final year Students of CSE, EEE, ECE and IT department. The tour was organized with the prior permission and guidance from Principal. This tour gave a wide expo to the students. Totally 87 students along with 6 faculty member had joined in this grand endeavour.

DAY 1 (17/07/2019) –ISRO-Trivandrum

Visited Rocket launching at 12.00 p.m, Kovalam beach and Sree Padmanabhaswamy Temple.

DAY 2 (18/07/2019) –Kerala

Visited Thirparappu falls, Padmanabhaswamy palace and Church

DAY 3 (19/07/2019) – Kanyakumari

Visited Sunrise,Vivenkanda rock,Thiruvalluvar statue and Madurai meenachi amman temple.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.It
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201, KALLAKURICHI DT

IV COORDINATOR

IT8201   **INFORMATION TECHNOLOGY ESSENTIALS**   **L T P C**

                                                                                        3 0 0 3

OBJECTIVES:
  ☐ To introduce the concept of Internet, Networks and its working principles.
  ☐ To know scripting languages.
  ☐ To understand various applications related to Information Technology.

UNIT I   WEB ESSENTIALS   9
Creating a Website - Working principle of a Website - Browser fundamentals - Authoring tools - Types of servers: Application Server - Web Server - Database Server

UNIT II   SCRIPTING ESSENTIALS   9
Need for Scripting languages - Types of scripting languages - Client side scripting - Server side scripting - PHP - Working principle of PHP - PHP Variables - Constants - Operators — Flow Control and Looping - Arrays - Strings - Functions - File Handling - PHP and MySQL - PHP and HTML - Cookies - Simple PHP scripts

UNIT III   NETWORKING ESSENTIALS   9
Fundamental computer network concepts - Types of computer networks - - Network layers - TCP/IP model - Wireless Local Area Network - Ethernet - WiFi - Network Routing - Switching - Network components

UNIT IV   MOBILE COMMUNICATION ESSENTIALS   9
Cell phone working fundamentals - Cell phone frequencies & channels - Digital cell phone components - Generations of cellular networks - Cell phone network technologies / architecture -Voice calls & SMS

UNIT V   APPLICATION ESSENTIALS   9
Creation of simple interactive applications - Simple database applications - Multimedia applications - Design and development of information systems — Personal Information System — Information retrieval system — Social networking applications

                                                                      TOTAL: 45 PERIODS

OUTCOMES:
  On Completion of the course, the students should be able to:
    ☐ Design and deploy web-sites
    ☐ Design and deploy simple web-applications
    ☐ Create simple database applications
    ☐ Develop information system
    ☐ Describe the basics of networking and mobile communications

TEXT BOOKS:
1. Robin Nixon, "Learning PHP, MySQL, JavaScript, CSS & HTML5" Third Edition, O'REILLY,2014.
2. James F. Kurose, —Computer Networking: A Top-Down Approach‖, Sixth Edition, Pearson,2012.

REFERENCES:
1. Gottapu Sasibhushana Rao, "Mobile Cellular Communication", Pearson, 2012.
2. R. Kelly Rainer , Casey G. Cegielski , Brad Prince, Introduction to Information Systems, FifthEdition, Wiley Publication, 2014.
3. it-ebooks.org

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,FIE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

OBJECTIVES:

- To provide a strong foundation on fundamental concepts in Computational Intelligence.
- To enable Problem-solving through various searching techniques.
- To apply these techniques in applications which involve perception, reasoning and learning.
- To apply Computational Intelligence techniques for information retrieval
- To apply Computational Intelligence techniques primarily for machine learning.

UNIT I   INTRODUCTION   9

Introduction to Artificial Intelligence-Search-Heuristic Search-A* algorithm-Game Playing- Alpha-Beta Pruning-Expert systems-Inference-Rules-Forward Chaining and Backward Chaining- Genetic Algorithms.

UNIT II   KNOWLEDGE REPRESENTATION AND REASONING   9

Proposition Logic - First Order Predicate Logic – Unification – Forward Chaining -Backward Chaining - Resolution – Knowledge Representation - Ontological Engineering - Categories and Objects – Events
- Mental Events and Mental Objects - Reasoning Systems for Categories - Reasoning with Default Information - Prolog Programming.

UNIT III   UNCERTAINTY   9

Non monotonic reasoning-Fuzzy Logic-Fuzzy rules-fuzzy inference-Temporal Logic-Temporal Reasoning-Neural Networks-Neuro-fuzzy Inference.

UNIT IV   LEARNING   9

Probability basics - Bayes Rule and its Applications - Bayesian Networks — Exact and Approximate Inference in Bayesian Networks - Hidden Markov Models - Forms of Learning - Supervised Learning - Learning Decision Trees — Regression and Classification with Linear Models - Artificial Neural Networks — Nonparametric Models - Support Vector Machines - Statistical Learning - Learning with Complete Data - Learning with Hidden Variables- The EM Algorithm — Reinforcement Learning

UNIT V   INTELLIGENCE AND APPLICATIONS   9

Natural language processing-Morphological Analysis-Syntax analysis-Semantic Analysis-AII applications — Language Models - Information Retrieval — Information Extraction - Machine Translation — Machine Learning - Symbol-Based — Machine Learning: Connectionist — Machine Learning.

                                                              TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course, the students will be able to

- Provide a basic exposition to the goals and methods of Computational Intelligence.
- Study of the design of intelligent computational techniques.
- Apply the Intelligent techniques for problem solving
- Improve problem solving skills using the acquired knowledge in the areas of, reasoning, naturallanguage understanding, computer vision, automatic programming and machine learning.

TEXT BOOKS:

1. Stuart Russell, Peter Norvig, —Artificial Intelligence: A Modern Approachǁ, Third Edition, PearsonEducation / Prentice Hall of India, 2010.
2. Elaine Rich and Kevin Knight, —Artificial Intelligenceǁ, Third Edition, Tata McGraw-Hill, 2010.

REFERENCES:

1. Patrick H. Winston. "Artificial Intelligence", Third edition, Pearson Edition, 2006.
2. Dan W.Patterson, —Introduction to Artificial Intelligence and Expert Systemsǁ, PHI, 2006.
3. Nils J. Nilsson, —Artificial Intelligence: A new Synthesisǁ, Harcourt Asia Pvt. Ltd., 2000.

IT8602	MOBILE COMMUNICATION	L	T	P	C
		3	0	0	3

OBJECTIVES:

The student should be made to:

- Understand the basic concepts of mobile computing
- Understand Wireless LAN, Bluetooth and WiFi Technologies
- Be familiar with the network protocol stack
- Learn the basics of mobile telecommunication system
- Be exposed to Ad-Hoc networks

UNIT I   INTRODUCTION   9

Introduction to Mobile Computing – Applications of Mobile Computing- Generations of MobileCommunication Technologies-MAC   Protocols—SDMA-TDMA-FDMA- CDMA.

UNIT II   MOBILE TELECOMMUNICATION SYSTEM   9

GSM – Architecture – Protocols – Connection Establishment – Frequency Allocation – Routing –Mobility Management – Security –GPRS- UMTS- Architecture

UNIT III   WIRELESS NETWORKS   9

Wireless LANs and PANs – IEEE 802.11 Standard – Architecture – Services – Blue Tooth- Wi-Fi –WiMAX

UNIT IV   MOBILE NETWORK LAYER   9

Mobile IP — DHCP — AdHoc– Proactive and Reactive Routing Protocols — Multicast Routing-Vehicular Ad Hoc networks (VANET) –MANET Vs VANET – Security

UNIT V   MOBILE TRANSPORT AND APPLICATION LAYER   9

Mobile TCP– WAP – Architecture – WDP – WTLS – WTP –WSP – WAE – WTA Architecture – WML

TOTAL:45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Explain the basics of mobile telecommunication system
- Illustrate the generations of telecommunication systems in wireless network
- Understand the architecture of Wireless LAN technologies
- Determine the functionality of network layer and Identify a routing protocol for a given Ad hocnetworks
- Explain the functionality of Transport and Application layer

TEXT BOOKS:

1. Jochen Schiller, —Mobile Communications‖, PHI, Second Edition, 2003.

2. Prasant Kumar Pattnaik, Rajib Mall, —Fundamentals of Mobile Computing‖, PHI LearningPvt.Ltd, New Delhi — 2012

REFERENCES:

1. Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobilesystems",Thomson Asia Pvt Ltd, 2005.

2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, —Principles of MobileComputing‖, Springer, 2003.

3. William.C.Y.Lee,—Mobile Cellular Telecommunications-Analog and Digital Systems‖, Second Edition,Tata Mc Graw Hill Edition ,2006.

4. C.K.Toh, —AdHoc Mobile Wireless Networks‖, First Edition, Pearson Education, 2002.

5. Android Developers : http://developer.android.com/index.html

6. Apple Developer : https://developer.apple.com/

7. Windows Phone Dev Center : http://developer.windowsphone.com

8. BlackBerry Developer : http://developer.blackberry.com

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CS8091	BIG DATA ANALYTICS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To know the fundamental concepts of big data and analytics.
- To explore tools and practices for working with big data
- To learn about stream computing.
- To know about the research that requires the integration of large amounts of data.

UNIT I   INTRODUCTION TO BIG DATA   9

Evolution of Big data - Best Practices for Big data Analytics - Big data characteristics - Validating - The Promotion of the Value of Big Data - Big Data Use Cases- Characteristics of Big Data Applications - Perception and Quantification of Value -Understanding Big Data Storage - A General Overview of High- Performance Architecture - HDFS - MapReduce and YARN - Map Reduce Programming Model

UNIT II   CLUSTERING AND CLASSIFICATION   9

Advanced Analytical Theory and Methods: Overview of Clustering - K-means - Use Cases - Overview of the Method - Determining the Number of Clusters - Diagnostics - Reasons to Choose and Cautions .- Classification: Decision Trees - Overview of a Decision Tree - The General Algorithm - Decision Tree Algorithms - Evaluating a Decision Tree - Decision Trees in R - Naïve Bayes - Bayes' Theorem -Naïve Bayes Classifier.

UNIT III   ASSOCIATION AND RECOMMENDATION SYSTEM   9

Advanced Analytical Theory and Methods: Association Rules - Overview - Apriori Algorithm - Evaluation of Candidate Rules - Applications of Association Rules - Finding Association& finding similarity - Recommendation System: Collaborative Recommendation- Content Based Recommendation -Knowledge Based Recommendation- Hybrid Recommendation Approaches.

UNIT IV   STREAM MEMORY   9

Introduction to Streams Concepts – Stream Data Model and Architecture - Stream Computing, Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimatingmoments – Counting oneness in a Window – Decaying Window – Real time Analytics Platform(RTAP)applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions. Using Graph Analytics for Big Data: Graph Analytics

UNIT V   NOSQL DATA MANAGEMENT FOR BIG DATA AND VISUALIZATION   9

NoSQL Databases : Schema-less Modelsl: Increasing Flexibility for Data Manipulation-Key Value Stores- Document Stores - Tabular Stores - Object Data Stores - Graph Databases Hive - Sharding —Hbase – Analyzing big data with twitter - Big data for E-Commerce Big data for blogs - Review of Basic Data Analytic Methods using R.

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to:

- Work with big data tools and its analysis techniques
- Analyze data by utilizing clustering and classification algorithms
- Learn and apply different mining algorithms and recommendation systems for large volumes ofdata
- Learn NoSQL databases and management.

TEXT BOOKS:

1. Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge UniversityPress, 2012.
2. David Loshin, "Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph", Morgan Kaufmann/El sevier Publishers, 2013.

REFERENCES:

1. EMC Education Services, "Data Science and Big Data Analytics: Analyzing, Visualizing and Presenting Data", Wiley publishers, 2015.
2. Bart Baesens, "Analytics in a Big Data World: The Essential Guide to Data Science and itsApplications", Wiley Publishers, 2015.
3. Dietmar Jannach and Markus Zanker, "Recommender Systems: An Introduction", CambridgeUniversity Press, 2010.
4. Kim H. Pries and Robert Dunnigan, "Big Data Analytics: A Practical Guide for Managers " CRCPress, 2015.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CS8092	COMPUTER GRAPHICS AND MULTIMEDIA	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To develop an understanding and awareness how issues such as content, information architecture, motion, sound, design, and technology merge to form effective and compelling interactive experiences for a wide range of audiences and end users.
- To become familiar with various software programs used in the creation and implementation of multi- media and appreciate the importance of technical ability and creativity within design practice.
- To gain knowledge about graphics hardware devices and software used and understand the two-dimensional graphics and their transformations.
- To understand the three-dimensional graphics and their transformations and appreciate illumination and color models
- To become familiar with understand clipping techniques and to become familiar with Blender Graphics

UNIT I   ILLUMINATION AND COLOR MODEL   9

Light sources - basic illumination models — halftone patterns and dithering techniques; Properties of light - Standard primaries and chromaticity diagram; Intuitive colour concepts - RGB colour model - YIQ colour model - CMY colour model - HSV colour model - HLS colour model; Colour selection. Output primitives — points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

UNIT II   TWO-DIMENSIONAL GRAPHICS   9

Two dimensional geometric transformations — Matrix representations and homogeneous coordinates, composite transformations; Two dimensional viewing — viewing pipeline, viewing coordinate reference frame; window-to-viewport coordinate transformation, Two dimensional viewing functions; clipping operations — point, line, and polygon clipping algorithms.

UNIT III   THREE-DIMENSIONAL GRAPHICS   9

Three dimensional concepts; Three dimensional object representations — Polygon surfaces and tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations — Bezier curves and surfaces. TRANSFORMATION AND VIEWING: Three dimensional geometric and modeling transformations; Three dimensional viewing — viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

UNIT IV   MULTIMEDIA SYSTEM DESIGN & MULTIMEDIA FILE HANDLING   9

Multimedia basics − Multimedia applications − Multimedia system architecture − Evolving technologies for multimedia − Defining objects for multimedia systems − Multimedia data interface standards − Multimedia databases. Compression and decompression − Data and file format standards − Multimedia I/O technologies − Digital voice and audio − Video image and animation − Full motion video − Storage and retrieval technologies.

UNIT V   HYPERMEDIA   9

Multimedia authoring and user interface - Hypermedia messaging -Mobile messaging − Hypermedia message component − Creating hypermedia message − Integrated multimedia message standards − Integrated document management − Distributed multimedia systems. **CASE STUDY: BLENDER GRAPHICS** Blender Fundamentals — Drawing Basic Shapes — Modelling −Shading & Textures

TOTAL: 45   PERIODS

OUTCOMES:
At the end of the course, the students should be able to:
- Design two dimensional graphics.
- Apply two dimensional transformations.
- Design three dimensional graphics.
- Apply three dimensional transformations

TEXT BOOKS:

1. Donald Hearn and Pauline Baker M, ―Computer Graphics", Prentice Hall, New Delhi, 2007 [UNIT I ― III]
2. Andleigh, P. K and Kiran Thakrar, ―Multimedia Systems and Design‖, PHI, 2003. [UNIT IV,V]

REFERENCES:

1.   Judith Jeffcoate, ―Multimedia in practice: Technology and Applications‖, PHI, 1998.
2.   Foley, Vandam, Feiner and Hughes, Computer Graphics: Principles and Practice‖, 2nd Edition, Pearson Education, 2003.
3.   Jeffrey McConnell, ―Computer Graphics: Theory into Practice‖, Jones and Bartlett Publishers,2006.
4.   Hill F S Jr., "Computer Graphics", Maxwell Macmillan , 1990.

IT6801   **SERVICE ORIENTED ARCHITECTURE**   **L T P C**

                                                                                           3 0 0 3

OBJECTIVES:

The student should be made to:

- Learn XML fundamentals.
- Be exposed to build applications based on XML.
- Understand the key principles behind SOA.
- Be familiar with the web services technology elements for realizing SOA. ·
- Learn the various web service standards.

UNIT I   **INTRODUCTION TO XML**   **9**

XML document structure – Well formed and valid documents – Namespaces – DTD – XML Schema –X-Files.

UNIT II   **BUILDING XML- BASED APPLICATIONS**   **9**

Parsing XML – using DOM, SAX – XML Transformation and XSL – XSL Formatting – ModelingDatabases in XML.

UNIT III   **SERVICE ORIENTED ARCHITECTURE**   **9**

Characteristics of SOA, Comparing SOA with Client-Server and Distributed architectures – Benefits ofSOA -- Principles of Service orientation – Service layers.

UNIT IV   **WEB SERVICES**   **9**

Service descriptions – WSDL – Messaging with SOAP – Service discovery – UDDI – MessageExchange Patterns – Orchestration – Choreography –WS Transactions.

UNIT V   **BUILDING SOA-BASED APPLICATIONS**   **9**

Service Oriented Analysis and Design – Service Modeling – Design standards and guidelines --Composition – WS-BPEL – WS-Coordination – WS-Policy – WS-Security – SOA support in J2EE.

                                                              TOTAL: 45 PERIODS

OUTCOMES:

Upon successful completion of this course, students will be able to:

- Build applications based on XML.
- Develop web services using technology elements.
- Build SOA-based applications for intra-enterprise and inter-enterprise applications.

TEXTBOOKS:

1. Ron Schmelzer et al. " XML and Web Services", Pearson Education, 2002
2. Thomas Erl, "Service Oriented Architecture: Concepts, Technology, and Design", PearsonEducation, 2005.

REFERENCES:

1. Frank P.Coyle, "XML, Web Services and the Data Revolution", Pearson Education, 2002.
2. Eric Newcomer, Greg Lomow, "Understanding SOA with Web Services",   Pearson Education,2005.
3. Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services: An Architect'sGuide", Prentice Hall, 20044.
4. James McGovern,Sameer Tyagi, Michael E.Stevens, Sunil Mathew, "Java Web.Services Architecture",
   Morgan Kaufmann Publishers, 2003.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

SMART PHONE BASED BIOMETRIC ATTENDANCE SYSTEM

A PROJECT REPORT

submitted by

A.ANJALAI   **621116205001**

R.GRACYNIRMALA   **621116205005**

in partial fulfillment for the award of the degree

of

BACHLOR OF TECHNOLOGY

in

INFORMATION TECHNOLOGY

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY :: CHENNAI 600 025

APRIL 2020

i

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY :: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report on **"SMART PHONE BASED BIOMETRIC ATTENDANCE SYSTEM"** is the bonafide work of A.ANJALAI, R.GRACYNIRMALA, who carried out project work under my supervision.
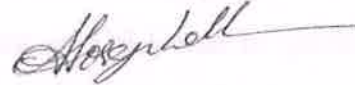
SIGNATURE

Mrs.P.Sumathi, M.E.,

HEAD OF THE DEPARTMENT

Assistant Professor/IT,

Idhaya Engineering College for Women,

Chinnasalem-606 201.

SIGNATURE

Mrs.P.Sumathi, M.E.,

SUPERVISOR

Assistant Professor/IT,

Idhaya Engineering College for Women
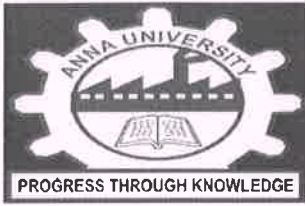
Chinnasalem-606 201.

INTERNAL EXAMINER

EXTERNAL EXAMINER

ii

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Recently, indoor localization has witnessed an increase in interest, due to the potential wide range of using in different applications, such as Internet of Things (IoT). It is also providing a solution for the absence of Global Positioning System (GPS) signals inside buildings. Different techniques have been used for performing the indoor localization, such as sensors and wireless technologies. In this paper, an indoor localization and object tracking system is proposed based on Wi-Fi transmission technique. It is done by distributing different Wi-Fi sources around the building to read the data of the tracked objects. This is to measure the distance between the Wi-Fi receiver and the object to allocate and track it efficiently. The test results show that the proposed system is working in an efficient way with low cost.

iii

GAS LEVEL DETECTION AND AUTOMATIC CYLINDER BOOKING USING IOT

A PROJECT REPORT

submitted by

J. ANUSUYA   **621116205002**

V.DHANUSUYA   **621116205003**

J. JASMIN MARY   **621116205006**

R. RAJALAKSHMI   **621116205009**

in partial fulfillment for the award on the degree

of

BACHLOR OF TECHNOLOGY

in

INFORMATION TECHNOLOGY

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY::CHENNAI 600 025

APRIL 2020

i

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

BONAFIDE CERTIFICATE

Certified that the project report on **GAS LEVEL DETECTION AND AUTOMATIC CYLINDER BOOKING USING IOT** is the bonafide work of **J.ANUSUYA, V.DHANUSUYA, J.JASMIN MARY** and **R.RAJALAKSHMI** who carried out the project work under my supervision.

SIGNATURE

Ms.P.Sumathi M.E..,

HEAD OF THE DEPARTMENT

Assistant Professor/IT,

Idhaya Engineering College for Women,

Chinnasalem - 606201

SIGNATURE

Mr.A.Joseph Selva Kumar M.E

SUPERVISOR

Associate Professor/IT,

Idhaya Engineering College for Women,

Chinnasalem - 606201

INTERNAL EXAMINER

EXTERNAL EXAMINER

ii

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.;
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

LPG is widely used for cooking in many countries for economic reasons, for convenience or because it is the preferred fuel source. This paper focus on the application of the IOT which is used for measuring and displaying the gasoline content present in household LPG cylinder and this is helpful in automatic booking of new LPG cylinder and also detect the gas leakage. Usually the capacity of LPG in Cylinder is not determined, so we are going to display the level of LPG. The level of LPG is measured using load sensor (SEN-10245). The output of the sensor is connected with Arduino R3. By use of GSM Module, the information is sent to user by SMS (short messaging service) and also automatic booking is done by dialling the registered gas booking number. we can detect the current LPG level and it is continuously displayed on the blynk. We can know the validity of LPG usage from the date of initialization. By use of IOT the user is alerted by giving the message to their mobile phone when the LPG level is critically low (below 20%). Automatic booking of new LPG by auto dialling of gas booking number and by this we prevent pre-booking and late booking.

iii

CCTV CAMERA MONITORING SYSTEM USING GOOGLE SERVER AS A CLOUD STORAGE

A PROJECT REPORT

submitted by

J.GOWSHIKA	**621116205004**
R.PRIYA	**621116205007**
E.PRIYANKA	**621116205008**
K.SHALINI	**621116205012**

in partial fulfillment for the award of the degree

of

BACHLOR OF TECHNOLOGY

in

INFORMATION TECHNOLOGY

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

ANNA UNIVERSITY :: CHENNAI 600 025

APRIL 2020

i

BONAFIDE CERTIFICATE

Certified that this project report on "**CCTV CAMERA MONITORING SYSTEM USING GOOGLE SERVER AS A CLOUD STORAGE**" is the bonafide work of **J.GOWSHIKA,R.PRIYA, E.PRIYANKA,K.SHALINI** who carried out the project work under my supervision.

SIGNATURE

Mrs.P.Sumathi, M.E.,

HEAD OF THE DEPARTMENT

Assistant Professor/IT,

Idhaya Engineering College for Women,

Chinnasalem-606 201.

SIGNATURE

Sr.A.Maria Anand Milani, M.E.,

SUPERVISOR

Assistant Professor/IT,

Idhaya Engineering College for Women

Chinnasalem-606 201.

INTERNAL EXAMINER

EXTERNAL EXAMINER

ii

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

The surveillance camera was implemented in every house to monitor various criminal activities. In that the camera recordings are stored in local storage with wired connection. It may be disconnected or damaged by some criminals, so that it may be unused. Then, it was monitored through the cloud system and it was also hacked by third party server in the cloud system. In order to avoid these issues this project proposes a solution of securely monitoring and storing the media in the Google Drive as a Cloud storage. For this we are configuring the camera with the most secured cloud storage in Google Drive to store and view the live streaming through YouTube.

iii

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

M.E-COMMUNICATION SYSTEMS

CU5191   **ADVANCED RADIATION SYSTEMS**   L   T   P   C
                                                                                3   0   0   3

OBJECTIVES:
- To understand antenna radiation and its parameters.
- To enhance the student knowledge in the area of various antenna design.
- To design mono pole, dipole and patch antenna and to impart the knowledge about modernantennas.

UNIT I   ANTENNA FUNDAMENTALS   9
Wave equations, radiation pattern, HPBW,FNBW, gain and directivity, polarization, equivalent circuit, radiation resistance, Radiation integrals, Radiation from surface and line current distributions — dipole, monopole, loop antenna, Antenna parameters, Image theory; Induction, reciprocity theorem, Balance to unbalance transformer, Introduction to numerical techniques.

UNIT II   RADIATION FROM APERTURES   9
Field equivalence principle, Radiation from Rectangular and Circular apertures, Uniform aperture, distribution on an infinite ground plane; Slot antenna; Horn antenna; Reflector antenna, aperture blockage, design considerations.

UNIT III   ARRAYS   9
Introduction-General structure of phased array, linear array theory, variation of gain as a function of pointing direction, effects of phase quantization, frequency scanned arrays, analog beamforming matrices-Active modules, digital beam forming, MEMS technology in phased arrays-Retrodirectiveand self phased arrays.

UNIT IV   MICRO STRIP ANTENNA   9
Radiation mechanism from patch; Excitation techniques; Microstrip dipole; Rectangular patch, Circular patch, and Ring antenna — radiation analysis from transmission line model, cavity model; input impedance of rectangular and circular patch antenna; Microstrip array and feed network; Applications of microstrip array antenna.

UNIT V   SPECIAL ANTENNAS AND MEASUREMENTS   9
Mobile phone antenna ,base station, hand set antenna, UWB antenna, PIFA, Vivaldi antenna,Antenna for automobiles, Broadband antenna, antenna factor, Gain, impedance and radiation pattern
measurements, Test sites and anechoic chamber.

                                        TOTAL :   45   PERIODS

OUTCOMES:
- Ability to understand antenna concepts
- Ability to design antenna for various applications
- Knowledge of modern antenna design

REFERENCES:
1. Balanis.A, "Antenna Theory Analysis and Design", John Wiley and Sons, New York, 1982.
2. Hubregt.J.Visser "Antenna Theory and Applications" 1st Edition, John Wiley & Sons Ltd,New York,2012.
3. S.Drabowitch et.al., "Modern Antennas", 2nd Edition Springer science business Media,Inc.2005
4. Xavier Begaud, "Ultra Wide Band Antennas" , 1st Edition, ISTE Ltd and John Wiley & Sons Ltd, New York,2013.
5. Zhijun Zhang" Antenna Design for Mobile Devices" 1st Edition, John Wiley & Sons (Asia) Ltd, New York,2011.

PERFORMANCE IMPROVEMENT USING ENERGY EFFICIENT SLEEP SCHEDULING ALGORITHM FOR MULTIMEDIA DELIVERY IN D2D COOPERATIVE COMMUNICATION

A THESIS

Submitted by

K.SABARISHWARI

in partial fulfillment for the award of the degree of

MASTER OF ENGINEERING IN
COMMUNICATION SYSTEMS

IDHAYA ENGINEERING COLLEGE FOR WOMEN
CHINNASALEM
DEPARTMENT OF ELECTRONICS AND
COMMUNICATION ENGINEERING
ANNA UNIVERSITY, CHENNAI

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this Thesis titled **"PERFORMANCE IMPROVEMENT USING ENERGY EFFICIENT SLEEP SCHEDULING ALGORITHM FOR MULTIMEDIA DELIVERY IN D2D COOPERATIVE COMMUNICATION"** is the bonafide work of **K.SABARISHWARI (621118403006)** who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Dr.S.A.AMUTHA JEEVAKUMARI,Ph.D

HEAD OF THE DEPARTMENT

Professor

Department of Electronics &

Communication Engineering

Idhaya Engineering College

for Women

Chinnasalem-606 201.

SIGNATURE

Mrs.K.SOLAIYAMMAL,M.E

SUPERVISOR

Assistant Professor

Department of Electronics &

Communication Engineering

Idhaya Engineering College

for Women

Chinnasalem-606 201.

Submitted for the Project Phase II viva voce held on **25/09/2020**

INTERNAL EXAMINER (1)

INTERNAL EXAMINER (2)

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,

PRINCIPAL

IDHAYA ENGG. COLLEGE FOR WOMEN

CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

The continuous advanced in the storage and transmission capabilities of smart devices have made them possible to share multimedia services with each other through Device to-Device (D2D) communications. In wireless sensor networks, the D2D Communication have high density of node's distribution will result in transmission collision, Packet loss and energy dissipation of redundant data. To avoid the above problems, an Energy-Efficient Sleep Scheduling Algorithm with similarity measure for wireless sensor networks (ESSM) is proposed, which will schedule the sensors into the active or sleep mode to reduce energy consumption effectively. Energy Efficient Sleep Scheduling Algorithm is also increase the life time. Simulations and results show that our method can achieve better performances such as to reduce the packet loss, avoid collision and increase the throughput.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CU5091   ADVANCED SATELLITE COMMUNICATION AND NAVIGATION SYSTEMS   L T P C
3 0 0 3

OBJECTIVES:

The students should be made to be
- Learn M2M developments and satellite applications
- Understand Satellite Communication In Ipv6 Environment

UNIT I   OVERVIEW OF SATELLITE COMMUNICATION   9

Overview of satellite communication and orbital mechanics Link budget Parameters, Link budget calculations, Auxiliary Equations, Performance Calculations.

UNIT II   M2M DEVELOPMENTS AND SATELLITE APPLICATIONS   9

Overview of the Internet of Things and M2M- M2M Applications Examples and Satellite Support- Satellite Roles Context and Applications- Antennas for Satellite M2M Applications- M2M Market Opportunities for Satellite Operators- Ultra HD Video/TV and Satellite Implications- High Throughput Satellites (HTS) and Ka/Ku Spot Beam Technologies- Aeronautical, Maritime and other Mobility Services.

UNIT III   SATELLITE COMMUNICATION IN IPV6 ENVIRONMENT   9

Overview of IPv6 and its benefits for Satellite Networks - Migration and Coexistence--Implementation scenarios and support- Preparations for IPv6 in Satellite communication- Satellite specific Protocol issues in IPv6 — Impact of IPv6 on Satellite Network architecture and services-Detailed transitional plan- IPv6 demonstration over satellites - Key results and recommendations.

UNIT IV   SATELLITE NAVIGATION AND GLOBAL POSITIONING SYSTEM   9

Over view of Radio and Satellite Navigation, GPS Principles, Signal model and Codes, Satellite Signal Acquisition, Mathematical model of GPS observables, Methods of processing GPS data , GPS Receiver Operation and Differential GPS. IRNSS, GAGAN, GLONASS and Galileo.

UNIT V   DEEP SPACE NETWORKS AND INTER PLANETARY MISSIONS   9

Introduction — Functional description - Design procedure and performance criterion-Mars exploration Rover- Mission and space craft summary-Telecommunication subsystem overview-Ground Subsystem-Telecom subsystem and Link performance Telecom subsystem Hardware and software Chandrayaan-1 Mission - Mission and space craft summary-Telecommunication subsystem overview- Ground Subsystem-Telecom subsystem and Link performance. Mangalyaan Mission - Mission and space craft summary-Telecommunication subsystem overview- Ground Subsystem-Telecom subsystem and Link performance.

OUTCOMES:

At the end of this course, the student should be able to:
- Discuss satellite navigation and global positioning system
- Outline deep space networks and inter planetary missions

REFERENCES:

1. Adimurthy.V," Concept design and planning of India's first interplanetary mission" CurrentScience, VOL. 109, NO. 6, 1054 25 SEPTEMBER 2015.
2. Anil K. Maini, Varsha Agrawal, 'Satellite Technology: Principles and Applications', Third Edition,Wiley, 2014.
3. Daniel Minoli' "Innovations in Satellite Communication and Satellite Technology" Wiley, 2015
4. Daniel Minoli, "Satellite Systems Engineering in an IPv6 Environment", CRC Press, FirstEdition, 2009.
5. Hofmann-Wellenhof B., Lichtenegger H., and Elmar Wasle, "Global Navigational SatelliteSystems" Springer-Verlag, 2008.
6. Jim Taylor, " Deep Space Communications" John Wiley & Sons, 2016.
7. Louis J. Ippolito, Jr. "Satellite Communications Systems Engineering: Atmospheric Effects,Satellite Link Design and System Performance", Second Edition, 2017
8. http://www.isro.gov.in/pslv-c25-mars-orbiter-mission
9. https://en.wikipedia.org/wiki/Mars_Orbiter_Mission
10. https://en.wikipedia.org/wiki/Chandrayaan-1

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

SMART WEARABLE NAVIGATION SYSTEM FOR VISUALLY IMPAIRED WITH VOICE AND VIBRATION ALERT

A THESIS

submitted by

KAMALI F

in partial fulfillment for the award of the degree of

MASTER OF ENGINEERING IN

COMMUNICATION SYSTEMS

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

DEPARTMENT OF ELECTRONICS AND

COMMUNICATION ENGINEERING

ANNA UNIVERSITY, CHENNAI

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

This is to certify that this thesis titled **"SMART WEARABLE NAVIGATION SYSTEM FOR VISUALLY IMPAIRED WITH VOICE AND VIBRATION ALERT"** is the bonafide work of **KAMALI. F (621118403003)** who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

25.9.20	*Dhivya priya*
SIGNATURE	**SIGNATURE**
Dr. S.A. Amutha Jeevakumari, Ph.D	**Ms. V. Dhivya Priya, M.Tech**
HEAD OF THE DEPARTMENT	**SUPERVISOR**
Professor	Assistant Professor
Department of Electronics &	Department of Electronics &
Communication Engineering	Communication Engineering
Idhaya Engg.College for Women	Idhaya Engg.College for Women
Chinnasalem – 606 201.	Chinnasalem – 606 201.

Submitted for the Project Phase II viva voce held on <u>25/09/2020</u>

25.9.20	*S. G*
INTERNAL EXAMINER (1)	**INTERNAL EXAMINER (2)**

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Blind people have to rely on others for travelling and other activities. So to solve this problem to some extent we are introducing wearable watch device for Blind People with Voice and Vibration Alert. Persons who are blind and deaf frequently suffering when exercising the most basic things of daily life and that could put lives at risk while traveling, due to the lack of necessary equipment in our country that provides them with assistance to avoid the risk, we design and manufacture ultrasonic sensor handheld that combines the properties of sound monition and that benefit the blind and vibrating alert feature, which benefit from the experience of deafness. Sensor can detect obstacles within the designed range to avoid the blind person through the issuance of distinctive sound or vibration can be issued by the sense of the deaf by putting his finger on the button at the top of the device vibrate when there is a risk. The proposed device is used for guiding individuals who are blind or partially sighted. Moreover, it provides the voice alert to avoid obstacles based on ultrasonic sensors. Also the accelerometer monitors the person's position and used to identify fall down detection. A panic switch is also incorporated to send emergency alert the corresponding persons mobile. The primary advantage of the system compared to other system in the area is low cost, ease of transport, less power consumption, lightweight, and it could be utilized by those peoples who are technically challenged.

Dr.R.GURUMAN1,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

AP5152	ADVANCED DIGITAL SIGNAL PROCESSING	L	T	P	C
		3	2	0	4

OBJECTIVES:

- The student comprehends mathematical description and modelling of discrete time randomsignals.
- The student is conversant with important theorems and random signal processing algorithms.
- The student learns relevant figures of merit such as power, energy, bias and consistency.
- The student is familiar with estimation, prediction, filtering, multirate concepts andtechniques.

UNIT I   DISCRETE RANDOM SIGNAL PROCESSING   9+6

Discrete random processes – Ensemble averages – Wide sense stationary process – Properties -Ergodic process – Sample mean & variance - Auto-correlation and Auto-correlation matrices- Properties – White noise process – Weiner Khitchine relation - Power spectral density – Filtering random process – Spectral Factorization Theorem – Special types of Random Processes – AR,MA, ARMA Processes – Yule-Walker equations.

UNIT II   SPECTRUM ESTIMATION   9+6

Bias and Consistency of estimators - Non-Parametric methods – Periodogram – Modified Periodogram – Barlett's method – Welch's mehod – Blackman-Tukey method – Parametric methods – AR, MA and ARMA spectrum estimation - Performance analysis of estimators.

UNIT III   SIGNAL MODELING AND OPTIMUM FILTERS   9+6

Introduction- Least square method – Pade approximation – Prony's method – Levinson Recursion –Lattice filter - FIR Wiener filter – Filtering – Linear Prediction – Non Causal and Causal IIR WeinerFilter -– Mean square error – Discrete Kalman filter.

UNIT IV   ADAPTIVE FILTERS   9+6

FIR Adaptive filters - Newton's steepest descent method – Widrow Hoff LMS Adaptive algorithm –Convergence – Normalized LMS – Applications – Noise cancellation - channel equalization – echo canceller – Adaptive Recursive Filters - RLS adaptive algorithm – Exponentially weighted RLS- sliding window RLS.

UNIT V   MULTIRATE SIGNAL PROCESSING   9+6

Decimation - Interpolation – Sampling Rate conversion by a rational factor I/D – Multistage implementation of sampling rate conversion – Polyphase filter structures – Applications of multiratesignal processing.

TOTAL45+30: 75 PERIODS

OUTCOMES:

- Formulate time domain and frequency domain description of Wide Sense Stationary processin terms of matrix algebra and relate to linear algebra concepts.
- State W-K theorem, spectral factorization theorem, spectrum estimation, bias andconsistency of estimators.
- Wiener filtering, LMS algorithms, Levinson recursion algorithm, applications of adaptive filters
- Decimation, interpolation, Sampling rate conversion, Applications of multirate signalprocessing

REFERENCES:

1. John G. Proakis, Dimitris G. Manolakis, "Digital Signal Processing", Prentice Hall ofIndia, New Delhi, 2005.

2. Monson H. Hayes, "Statistical Digital Signal Processing and Modeling", John Wiley andSons Inc., New York, 2006.

3. P. P. Vaidyanathan, "Multirate Systems and Filter Banks", Prentice Hall, 1992.
4. S. Kay," Modern spectrum Estimation theory and application", Prentice Hall, Englehood Cliffs, NJ1988.

5. Simon Haykin, "Adaptive Filter Theory", Prentice Hall, Englehood Cliffs, NJ1986.
6. Sophoncles J. Orfanidis, "Optimum Signal Processing ", McGraw-Hill, 2000.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT,

DS5291   ADVANCED DIGITAL IMAGE PROCESSING   L T P C
                                                                              3 0 0 3

OBJECTIVES:
- To understand the image fundamentals.
- To understand the various image segmentation techniques.
- To extract features for image analysis.
- To introduce the concepts of image registration and image fusion.
- To illustrate 3D image visualization.

UNIT I   FUNDAMENTALS OF DIGITAL IMAGE PROCESSING   9

Elements of visual perception, brightness, contrast, hue, saturation, mach band effect, 2D image transforms-DFT, DCT, KLT,SVD. Image enhancement in spatial and frequency domain, Review of Morphological image processing.

UNIT II   SEGMENTATION   9

Edge detection, Thresholding, Region growing, Fuzzy clustering, Watershed algorithm, Active contour models, Texture feature based segmentation, Graph based segmentation, Wavelet based Segmentation - Applications of image segmentation.

UNIT III   FEATURE EXTRACTION   9

First and second order edge detection operators, Phase congruency, Localized feature extraction - detecting image curvature, shape features, Hough transform, shape skeletonization, Boundary descriptors, Moments, Texture descriptors- Autocorrelation, Co-occurrence features, Runlength features, Fractal model based features, Gabor filter, wavelet features.

UNIT IV   REGISTRATION AND IMAGE FUSION   9

Registration - Preprocessing, Feature selection - points, lines, regions and templates Feature correspondence - Point pattern matching, Line matching, Region matching, Template matching. Transformation functions - Similarity transformation and Affine Transformation. Resampling — Nearest Neighbour and Cubic Splines. Image Fusion - Overview of image fusion, pixel fusion, wavelet based fusion -region based fusion.

UNIT V   3D IMAGE VISUALIZATION   9

Sources of 3D Data sets, Slicing the Data set, Arbitrary section planes, The use of color, Volumetric display, Stereo Viewing, Ray tracing, Reflection, Surfaces, Multiple connected surfaces, Image processing in 3D, Measurements on 3D images.

                                                              TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students will be able to
- Explain the fundamentals digital image processing.
- Describe image various segmentation and feature extraction techniques for image analysis.
- Discuss the concepts of image registration and fusion.
- Explain 3D image visualization.

REFERENCES:
1. Ardeshir Goshtasby, " 2D and 3D Image registration for Medical, Remote Sensing andIndustrial Applications",John Wiley and Sons,2005.
2. Anil K. Jain, Fundamentals of Digital Image Processing', Pearson Education, Inc., 2002.
3. John C.Russ, "The Image Processing Handbook", CRC Press,2007.
4. Mark Nixon, Alberto Aguado, "Feature Extraction and Image Processing", AcademicPress,2008.
5. Rafael C. Gonzalez, Richard E. Woods, Digital Image Processing', Pearson,Education,Inc.,Second Edition, 2004.
6. Rick S.Blum, Zheng Liu, "Multisensor image fusion and its Applications", Taylor&Francis,2006.

A FIBER WIRELESS SENSOR NETWORKS QOS MECHANISM FOR SMART GRID APPLICATIONS

A THESIS

Submitted by

R.RANGEELA

in partial fulfillment for the award of the degree of

MASTER OF ENGINEERING IN
COMMUNICATION SYSTEMS

IDHAYA ENGINEERING COLLEGE FOR WOMEN
CHINNASALEM
DEPARTMENT OF ELECTRONICS AND
COMMUNICATION ENGINEERING
ANNA UNIVERSITY, CHENNAI
APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this project report titled **"A FIBER WIRELESS SENSOR NETWORKS QOS MECHANISM FOR SMART GRID APPLICATIONS"** is the bonafide work of **R.RANGEELA** **(621118403004)** who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Dr.S.A.AMUTHA JEEVAKUMARI, Ph.D

HEAD OF THE DEPARTMENT

PROFESSOR

Department of Electronics &
Communication Engineering,

Idhaya Engineering College for Women,

Chinnasalem-606 201.

SIGNATURE

Mr.M.MAHESH, M.Tech

SUPERVISOR

ASSISTANT PROFESSOR

Department of Electronics &
Communication Engineering

Idhaya Engineering College for Women,
Chinnasalem-606 201.

Submitted for the Project Phase II viva voce held on **25/09/2020**

INTERNAL EXAMINER (1)

INTERNAL EXAMINER (2)

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Smart grid applications, such as teleprotection, synchrophasors, remote condition monitoring, and control of assets, require timely and reliable data communication systems. Many communication architectures and solutions have been proposed to provide support for these smart grid applications, including fiber networks, wireless mobile networks, wireless sensor networks (WSNs), and so on. The use of heterogeneous solutions is an attractive architecture option since it combines the advantages of two or more communication systems to meet the delay and reliability requirements of the smart grid. Fiber-wireless sensor networks (Fi-WSNs) are gaining popularity as a reliable communication infrastructure in many other applications. This is due to the low cost, reliability, availability, the distributed nature of the WSNs, and the high bandwidth and reliability of the optical ber networks. Although the Fi-WSNs systems can provide a good delay performance, they may not meet the requirements of the above smart grid delay-critical applications. In this paper, we propose a novel adaptive and cross-layer service differentiation mechanism for the Fi-WSNs. The proposed mechanism implements an adaptive scheduling mechanism and allows WSNs to cooperate with the optical network unit (ONU) to reduce the delay for high priority traffic. We determine the effects of the proposed mechanism Software Defined Network (SDN) for delay critical smart grid

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

A HYBRID APPROACH FOR FOREST FIRE DETECTION USING IMAGE PROCESSING AND IOT BASED COMMUNICATION SYSTEM

A THESIS

Submitted by

RUTHRA E

in partial fulfillment for the award of the degree of

MASTER OF ENGINEERING IN

COMMUNICATION SYSTEMS

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

DEPARTMENT OF ELECTRONICS AND

COMMUNICATION ENGINEERING

ANNA UNIVERSITY, CHENNAI

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this report titled **"A HYBRID APPROACH FOR FOREST FIRE DETECTION USING IMAGE PROCESSING AND IOT BASED COMMUNICATION"** is the bonafide work of **RUTHRA E (621118403005)** who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Dr. S.A. Amutha Jeevakumari,Ph.D.,

HEAD OF THE DEPARTMENT,

Professor,

Department of Electronics &,

Communication Engineering,

Idhaya Engg. College for Women

Women Chinnasalem – 606 201.

SIGNATURE

Mrs.P.Poovizhi, M.E.,

SUPERVISOR,

Associate Professor,

Department of Electronics &

Communication Engineering,

Idhaya Engg. College for

Chinnasalem – 606 201

Submitted for the Project Phase II viva voice held on <u>25/09/2020</u>

INTERNAL EXAMINER(1)

INTERNAL EXAMINER(2)

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Forest fire is the main issue of catastrophe for environment. Once the fire inside deep forest starts, it burns and destroys everything and spreads everywhere within the forest. Such forest fire disasters should be curbed in order to protect fauna and flora habitats in the forest. Image processing is of interest with a rule based color model algorithm for fire pixel classification to detect fire. This algorithm uses both RGB and YCbCr color space model. Using YCbCr color space it can separate the luminance from the chrominance more effectively than RGB color space to heat signature present in the image not only separates fire flame pixels but also separates high temperature fire centre pixels which is captured by camera and followed by image segmentation. It gives 99.8% accuracy even with rotating camera.

This proposed system deals with design of all parameters which detects the fire occurred in forest by heat signature using Image Processing and implementing an IoT based device which is self sustained to send the information of exact fire location to concerned officials using cloud servers which would help fire fighting personnel to extinguish the fire in the location where it starts slowly. It also includes with the buzzer and water sprayer. This would prevent the fire to spread over a huge area and also able to take precautionary measures in order to prevent the fire which may occur in near future.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CU5151	ADVANCED DIGITAL COMMUNICATION TECHNIQUES	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the basics of signal-space analysis and digital transmission.
- To understand the coherent and noncoherent receivers and its impact on different channelcharacteristics.
- To understand the different Equalizers
- To understand the different block coded and convolutional coded digital communicationsystems.
- To understand the basics of Multicarrier and Multiuser Communications.

UNIT I   COHERENT AND NON-COHERENT COMMUNICATION   9

Coherent receivers – Optimum receivers in WGN – IQ modulation & demodulation – Noncoherent receivers in random phase channels; MFSK receivers – Rayleigh and Rician channels – Partially coherent receivers – DPSK; M-PSK; M-DPSK-BER Performance Analysis. Carrier Synchronization-Bit synchronization.

UNIT II   EQUALIZATION TECHNIQUES   9

Band Limited Channels- ISI – Nyquist Criterion- Controlled ISI-Partial Response signals- Equalization algorithms – Viterbi Algorithm – Linear equalizer – Decision feedback equalization – Adaptive Equalization algorithms.

UNIT III   BLOCK CODED DIGITAL COMMUNICATION   9

Architecture and performance — Binary block codes; Orthogonal; Biorthogonal; Transorthogonal — Shannon's channel coding theorem; Channel capacity; Matched filter; Concepts of Spread spectrum communication — Coded BPSK and DPSK demodulators– Linear block codes; Hammning; Golay; Cyclic; BCH ; Reed – Solomon codes. Space time block codes.

UNIT IV   CONVOLUTIONAL CODED DIGITAL COMMUNICATION   9

Representation of codes using Polynomial, State diagram, Tree diagram, and Trellis diagram —Decoding techniques using Maximum likelihood, Viterbi algorithm, Sequential and Threshold methods
– Error probability performance for BPSK and Viterbi algorithm, Turbo Coding.

UNIT V   MULTICARRIER AND MULTIUSER COMMUNICATIONS   9

Single Vs multicarrier modulation, orthogonal frequency division multiplexing (OFDM), Modulation and demodulation in an OFDM system, An FFT algorithmic implementation of an OFDM system, Bit and power allocation in multicarrier modulation, Peak-to-average ratio in multicarrier modulation. Introduction to CDMA systems, multiuser detection in CDMA systems — optimum multiuser receiver, suboptimum detectors, successive interference cancellation.

TOTAL :   45   PERIODS

OUTCOMES:

Upon Completion of the course, the students will be able to:

- Develop the ability to understand the concepts of signal space analysis for coherentand non- coherent receivers.
- Conceptually appreciate different Equalization techniques
- Possess knowledge on different block codes and convolutional codes.
- Comprehend the generation of OFDM signals and the techniques of multiuserdetection.

REFERENCES:

1. Bernard Sklar, "Digital Communications", second edition, Pearson Education, 2001.
2. John G. Proakis, "Digital Communication", Fifth Edition, Mc Graw Hill Publication, 2008.

3. M.K.Simon, S.M.Hinedi and W.C.Lindsey, "Digital communication techniques; Signal Design and Detection", Prentice Hall of India, New Delhi, 1995.
4. Richard Van Nee & Ramjee Prasad, "OFDM for Multimedia Communications" Artech House Publication, 2001.

5. Stephen G. Wilson, "Digital Modulation and Coding", First Indian Reprint, Pearson Education, 2003.

6. Simon Haykin, "Digital communications", John Wiley and sons, 1999.

REAL TIME SMART HOME MANAGEMENT SYSTEM BASED ON FACE RECOGNITION

A THESIS

Submitted by

A.SAMADHANA PRIYA

in partial fulfillment for the award of the degree of

MASTER OF ENGINEERING IN
COMMUNICATION SYSTEMS

IDHAYA ENGINEERING COLLEGE FOR WOMEN
CHINNASALEM
DEPARTMENT OF ELECTRONICS AND
COMMUNICATION ENGINEERING
ANNA UNIVERSITY, CHENNAI
APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.;
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this project report titled **"REAL TIME HOME MANAGEMENT SYSTEM BASED ON FACE RECOGNITION"** is the bonafide work of **A.SAMADHANA PRIYA** **(621118403007)** who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate

SIGNATURE

SIGNATURE

Dr.S.A.AMUTHA JEEVA KUMARI

HEAD OF THE DEPARTMENT

PROFESSOR

Department of Electronics &

Communication Engineering,

Idhaya Engineering College for Women,

Chinnasalem-606 201.

Mrs.S.DHANALAKSHMI,M.E.,

SUPERVISOR

ASSOCIATE PROFESSOR

Department of Electronics &

Communication Engineering

Idhaya Engineering College for Women,

Chinnasalem-606 201.

Submitted for the Project Phase II viva voce held on____25.9.2020_____

INTERNAL EXAMINER(1)

INTERNAL EXAMINER(2)

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

The present study aims to use the smart home application practically to enhancing control management of the home, security, and increase comfortably, and decrease energy consumption using biometric technique and cloud services. At the first stage, the proposed system works to identify member identification by using the face recognition method as a tool to enhance the home security, and home control management. The recognition procedure captures a member face image in a controlled environment by using a digital camera as a test image. The AdaBoost technique is utilized to detect and extract a member's faces for the train, and test member images. DWT with PCA methods have used to extract image features and dimension reduction. At the classified procedure, Euclidean distance method has been used for the matching process to verify home member's identification index. As well as, a special MATLAB procedure has been used to transmit the member's index to the cloud server. The cloud server analyses the received member identification in order to retrieve the verified member's profile, which contains specified appliances for each individual member. The home appliances are controlled by the highest priority member who has been registered in real time at home by the recognition stage. Then, the cloud server transmits a home member's privilege to the microcontroller through a Wi-Fi network submitting the required actions. The designed proposed smart home system.

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

NC5291   **COMMUNICATION NETWORK SECURITY**   **L T P C**
                                                                          3 0 0 3

OBJECTIVES :
   The students should be made to:
   - Understand the need and concept of security
   - Learn cryptosystems

UNIT I   INTRODUCTION AND NUMBER THEORY   9
Introduction to Information Security, Computer Security & Network Security. Need For Security. Security — Goals, Attacks, Security Services and Mechanisms, and Techniques. Number Theory and Mathematics for Symmetric Cryptography- Finite Arithmetic, Congruence Arithmetic-Linear Congruence and Quadratic Congruence. Mathematics for Asymmetric-Key Cryptography: Fermat‟s Theorem and Euler‟s Theorem, Primes, Primality Testing, Factorization, CRT, Exponentiation. Classical Symmetric-Key Ciphers –Substitution Ciphers, Transposition Ciphers.

UNIT II   SYMMETRIC AND ASYMMETRIC CRYPTOSYSTEMS   9
Modern Symmetric-Key Cipher - Block Ciphers (DES, 3DES, AES and its mode of operations), Stream Ciphers, Asymmetric-Key Cryptosystem- RSA, ElGamal, ECC, Key Management - Diffie- Hellman (DH) Mechanism, Kerberos — Needham Schroeder Protocol.

UNIT III   AUTHENTICATION, DIGITAL SIGNATURES AND CERTIFICATES   9
Message Integrity & Message Authentication - Message Authentication Code (MAC), Cryptographic Hash Functions — Birthday Attacks, Digital Signatures - Digital Signature Standards (FIPS 186-2), DSA (ANSI X9.30), RSA (ANSI X9.31) – Public Key Distribution – RSA schemes, Digital Certificates - PKI Certificates, PKI Life Cycle Management.

UNIT IV   TRUSTED IDENTITY   9
Entity Authentication: Password System- Fixed and One time Passwords (S/Key) RFC 2289 – Callback Systems, Zero Knowledge, Challenge and Response Systems – RADIUS — ITU-T X.509.

UNIT V   SECURITY AT LAYERS   9
Network Layer Security - IPSec, Transport Layer Security- SSL/TLS, SSH, Application Layer Security –PGP, S/MIME, Firewall - Concepts, Architecture, Packet Filtering, Proxy Services and Bastion Hosts.

                                                                  TOTAL: 45 PERIODS
OUTCOMES:
   At the end of this course, the students should be able to:
   - Explain digital signature standards
   - Discuss authentication
   - Explain security at different layers

 REFERENCES:
1. Behrouz A.Forouzan, "Cryptography and Network Security", Special Edition, Tata McGraw Hill,2007.
2. Bruce Scheneier, "Applied Cryptography", John Wiley & Sons, 1994.
3. Charlie Kaufmann, Radia Perlman, Mike Speciner, "Network Security", Second Edition, PrenticeHall, 2002
4. Douglas R.Stinson, "Cryptography: Theory and Practice", CRC Press Series on DiscreteMathematics and its Applications, 1995.
5. David M. Durton, "Elementary Number Theory", Tata Mcgraw Hill, Sixth Edition, 2009.
6. William Stallings "Cryptography and Network Security: Principles and Practice", 3rd Edition,Pearson Education, 2002.
7. William Stallings "Network Security Essentials: Applications and Standards", 2nd Edition,

NEURAL NETWORK BASED HUMAN AGE ESTIMATION AND CLASSIFICATION FROM MEDICAL IMAGING DATA

A THESIS

Submitted by

SARANYA R

in partial fulfillment for the award of the degree of

MASTER OF ENGINEERING IN COMMUNICATION SYSTEMS

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

DEPARTMENT OF ELECTRONICS AND

COMMUNICATION ENGINEERING

ANNA UNIVERSITY, CHENNAI

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this Thesis titled **"NEURAL NETWORK BASED HUMAN AGE ESTIMATION AND CLASSIFICATION FROM MEDICAL IMAGING DATA"** is the bonafide work of **SARANYA R** **(621118403008)**who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any othercandidate.

SIGNATURE

Dr.S.A.AMUTHA JEEVAKUMARI,Ph.D

HEAD OF THE DEPARTMENT

Professor

Department of Electronics &

  Communication Engineering

IdhayaEngg. College for Women

Chinnasalem-606 201.

SIGNATURE

Dr.Sr.A.JENITTA,M.E.,Ph.D

SUPERVISOR

Professor

Department of Electronics &

Communication Engineering

IdhayaEngg. College for Women

Chinnasalem-606 201.

Submitted for the Project Phase II viva voce held on   25.09.2020

INTERNAL EXAMINER (1)

INTERNAL EXAMINER(2)

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

The estimation of age is the major tedious process in now a days, based on the face and facial marks can be identify the age of a human but leading to the accurate results will not be a suitable method for the estimation of age. So the new method called estimation of age using the medical imaging data has been followed. The major estimation is done by the machine learning algorithms with predicted value. The aim of the project is to implement human age estimation based on medical imaging data using Back Propagation Neural Network (BPNN). Age classification is done using back propagation neural network. This method can be easily analyzed the age of a human. For the forensic application it will be more useful. The data from the medical image is extracted from feature extraction in the machine learning process. The simulation is done in MATLAB. The results are obtained through implementation ofback Propagation neural network. Accuracy of age estimation using BPNN is 3% higher than other conventional Probabilistic Neural Network (PNN) technique.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CU5291	ADVANCED WIRELESS COMMUNICATIONS SYSTEM	L T P C

3 0 0 3

OBJECTIVES:
The students should be made to:

- Understand Concepts of MIMO diversity and spatial multiplexing.
- Learn Massive MIMO system
- Know millimeter wave communication

UNIT I   INFORMATION THEORETIC ASPECTS OF MIMO   10
Review of SISO fading communication channels, MIMO Channel models, Classical i.i.d. and extended channels, Frequency selective and correlated channels models, Capacity of MIMO channels, Erogodic and outage capacity, capacity bounds and influence of channel properties on the capacity.

UNIT II   MIMO DIVERSITY AND SPATIAL MULTIPLEXING   10
Sources and types of diversity, analysis under Rayleigh fading, Diversity and channel knowledge. Alamouti space time code. MIMO spatial multiplexing: Space time receivers, ML, ZF, MMSE and Sphere decoding, BLAST receivers and Diversity multiplexing trade - off.

UNIT III   MASSIVE MIMO SYSTEM   9
Introduction - MIMO for LTE, capacity of massive MIMO, Pilot Design for massive MIMO, Resource allocation and transceivers design, Base band and RF implementation, Channel Models.

UNIT IV   MILLIMETER WAVE COMMUNICATION   8
Spectrum regulation, Channel propagation, Hardware technology for mmW systems, architecture and mobility, Beam forming techniques, Beam finding, Physical layer techniques - Duplex scheme and Transmission Scheme.

UNIT V   SOFTWARE DEFINED RADIO AND COGNITIVE RADIO   8
SDR - Definition, Origin, key characteristic, hardware and software architecture, waveforms. Cognitive Radio - Definitions, Cognitive theories, architectures, Cognitive radio as self controlling system, Ontology based cognitive radio.

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

- Analyze MIMO system.
- Discuss millimeter wave communication.
- Demonstrate software defined radio and cognitive radio.

REFERENCES:
1. David Tse and Pramod Viswanath, "Fundamentals of Wireless Communication", CambridgeUniversity Press 2005.
2. Hamid Jafarkhani, "Space - Time Coding: Theory and Practices", Cambridge University Press2005.
3. Mischa Dohler, Jose F. Monserrat Afif Osseiran " 5G Mobile and Wireless Communication Technology", Cambridge University Press 2016.
4. Mieczyslaw M Kokar, Lezek Lechowicz, "Cognitive Radio Interoperability through Waveform Reconfiguration" ARTECH House 2016.

MULTIPLE CHAIN ROUTING PROTOCOL (MCRP) WITH EDDEEC SCHEME FOR ENERGY EFFICIENCY IN WIRELESS SENSOR NETWORKS

A THESIS

Submitted by

M.S.SOWMIYA

in partial fulfillment for the award of the degree of

MASTER OF ENGINEERING IN

COMMUNICATION SYSTEMS

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

DEPARTMENT OF ELECTRONICS AND

COMMUNICATION ENGINEERING

ANNA UNIVERSITY,CHENNAI

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this project report titled "**MULTIPLE CHAIN ROUTING PROTOCOL(MCRP) WITH EDDEEC SCHEME FOR ENERGY EFFICIENCY IN WIRELESS SENSOR NETWORKS**" is the bonafide work of **M.S.SOWMIYA**(**621118403010**) who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Dr.S.A.AMUTHAJEEVAKUMARI,Ph.D

HEAD OF THE DEPARTMENT

Professor

Department of Electronics &

Communication Engineering

Idhaya Engineering College for Women

Chinnasalem-606 201.

SIGNATURE

Sr.J.CATHERINA MARY,M.E.

SUPERVISOR

Assistant Professor

Department of Electronics &

Communication Engineering

Idhaya Engineering College for Women

Chinnasalem-606 201.

Submitted for the Project Phase II viva voce held on **25/09/2020**

INTERNAL EXAMINER (1)

INTERNAL EXAMINER (2)

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Wireless sensor networks (WSNs) comprise a wide variety of applications. In most of the applications, the sensor nodes are distributed in a hostile area and nodes in WSNs are energy constrained, once it is installed, it would be difficult to recharge the energy source of those sensor nodes. There are many solutions that can be used to overcome the energy limitation issue and one of the main solutions is the routing algorithm used in the network. Routing algorithms in WSNs are responsible for maintaining and discovering the suitable routes in the networks. Therefore, this research presents a Multiple Chain Routing Protocol for Energy Efficiency in Homogeneous Wireless Sensor Networks (MCRP). The major objectives of the MCRP protocol are to increase the lifetime of WSNs by reducing the data transmission path to minimize energy consumption in WSN and to maximize the network stability period by distributing the load evenly among all nodes. The MCRP works within two stages: the initialization stage and the data transmission stage. Simulation results demonstrate that the presented algorithm MCRP achieves its design goals and outperforms the existing work such as Chain-Chain based routing protocol (CCBRP) and Two-stage chain routing protocol (TSCP) algorithms in terms of Network lifetime, FND and LND (first node and last node died), Network stability period and Energy consumption.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

MORPHOLOGICAL BASED RAIN STREAKS REMOVAL IN TRAFFIC SURVEILLANCE USING CNN TECHNIQUE

A THESIS

Submitted by

SNEHA S

in partial fulfillment for the award of the degree of

MASTER OF ENGINEERING IN

COMMUNICATION SYSTEMS

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

DEPARTMENT OF ELECTRONICS AND

COMMUNICATION ENGINEERING

ANNA UNIVERSITY, CHENNAI

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this Thesis titled **"MORPHOLOGICAL BASED RAINSTREAKS REMOVAL IN TRAFFIC SURVEILLANCE USING CNNTECHNIQUE"** is the bonafide work of SNEHA S (621118403011) who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

SIGNATURE

Dr. S.A. Amutha Jeevakumari ,Ph.D.,

Dr. Sr. A. Jenitta ,Ph.D.,

HEAD OF THE DEPARTMENT,

SUPERVISOR,

Professor,

Professor,

Department of Electronics&

Department of Electronics &

Communication Engineering,

Communication Engineering,

Idhaya Engg.College for Women,

Idhaya Engg.College for Women,

Chinnasalem –606201.

Chinnasalem – 606201.

Submitted for the Project Phase II viva voce held on <u>25/09/2020</u>

INTERNALEXAMINER (1)

INTERNALEXAMINER (2)

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Varying weather conditions, such as rainfall is generally regarded as a challenge for computer vision algorithms. One proposed solution to the challenges induced by rain is to artificially remove the rain from images using rain removal algorithms. The promise of this algorithm is that the rain-removed image frames will improve the performance of subsequent segmentation and tracking algorithms. However, rain removal algorithms are typically evaluated on their ability to remove synthetic rain on a small subset of images. In this project, the existing rain removal algorithms are reviewed and proposed a new dataset that consists of traffic surveillance sequences under a broad variety of weather conditions that include rain. The rainy image is taken as input image and the image is resized then the intensity values are adjusted followed by smoothening the image through gradient minimization to preserve the edges then color conversion, morphological operations and Convolution Neural Network (CNN) are performed and the original image is reconstructed. A new evaluation protocol that evaluates the rain removal algorithms on their ability to improve the performance of subsequent segmentation, instance segmentation, and feature tracking algorithms under rain has been proposed.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

M.E-COMPUTER SCIENCE ENGINEERING

CP5151   **ADVANCED DATA STRUCTURES AND ALGORITHMS**   L T P C
                                                                        4 0 0 4

OBJECTIVES:
- To understand the usage of algorithms in computing.
- To learn and use hierarchical data structures and its operations
- To learn the usage of graphs and its applications.
- To select and design data structures and algorithms that is appropriate forproblems.
- To study about NP Completeness of problems.

UNIT I   ROLE OF ALGORITHMS IN COMPUTING   **12**
Algorithms – Algorithms as a Technology- Insertion Sort – Analyzing Algorithms – Designing Algorithms- Growth of Functions: Asymptotic Notation – Standard Notations and Common Functions- Recurrences: The Substitution Method – The Recursion-Tree Method

UNIT II   HIERARCHICAL DATA STRUCTURES   **12**
Binary Search Trees: Basics – Querying a Binary search tree – Insertion and Deletion- Red-Black trees: Properties of Red-Black Trees – Rotations – Insertion – Deletion -B-Trees: Definition of B-trees – Basic operations on B-Trees – Deleting a key from a B-Tree- Fibonacci Heaps: structure – Mergeable-heap operations- Decreasing a key and deleting a node-Bounding the maximum degree.

UNIT III   GRAPHS   **12**
Elementary Graph Algorithms: Representations of Graphs – Breadth-First Search – Depth-FirstSearch – Topological Sort – Strongly Connected Components- Minimum Spanning Trees: Growing a Minimum Spanning Tree – Kruskal and Prim- Single-Source Shortest Paths: The Bellman-Ford algorithm – Single-Source Shortest paths in Directed Acyclic Graphs – Dijkstra'sAlgorithm; All-Pairs Shortest Paths: Shortest Paths and Matrix Multiplication – The Floyd- Warshall Algorithm;

UNIT IV   ALGORITHM DESIGN TECHNIQUES   **12**
Dynamic Programming: Matrix-Chain Multiplication – Elements of Dynamic Programming – Longest Common Subsequence- Greedy Algorithms: An Activity-Selection Problem – Elements of the Greedy Strategy- Huffman Codes.

UNIT V   NP COMPLETE AND NP HARD   **12**
NP-Completeness: Polynomial Time – Polynomial-Time Verification – NP- Completeness and Reducability – NP-Completeness Proofs – NP-Complete Problems

                                                                    TOTAL: 60 PERIODS

OUTCOMES:
Upon the completion of the course the students should be able to:
- Design data structures and algorithms to solve computing problems
- Design algorithms using graph structure and various string matching algorithms to solvereal-life problems
- Apply suitable design strategy for problem solving

REFERENCES:
1. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, ―Data Structures and Algorithms‖,Pearson Education, Reprint 2006.
2. Robert Sedgewick and Kevin Wayne, ―ALGORITHMS‖, Fourth Edition, Pearson Education.
3. S.Sridhar,‖Design and Analysis of Algorithms‖, First Edition, Oxford University Press. 2014
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, ―Introduction toAlgorithms, Third Edition, Prentice-Hall, 2011.

CP5191	MACHINE LEARNING TECHNIQUES	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce students to the basic concepts and techniques of Machine Learning.
- To have a thorough understanding of the Supervised and Unsupervised learningtechniques
- To study the various probability based learning techniques
- To understand graphical models of machine learning algorithms

UNIT I   INTRODUCTION   9

Learning – Types of Machine Learning – Supervised Learning – The Brain and the Neuron –Design a Learning System – Perspectives and Issues in Machine Learning – Concept Learning Task – Concept Learning as Search – Finding a Maximally Specific Hypothesis – Version Spacesand the Candidate Elimination Algorithm — Linear Discriminants — Perceptron — Linear Separability — Linear Regression.

UNIT II   LINEAR MODELS   9

Multi-layer Perceptron – Going Forwards – Going Backwards: Back Propagation Error – Multi- layer Perceptron in Practice — Examples of using the MLP — Overview — Deriving Back- Propagation — Radial Basis Functions and Splines — Concepts — RBF Network — Curse of
Dimensionality – Interpolations and Basis Functions – Support Vector Machines.

UNIT III   TREE AND PROBABILISTIC MODELS   9

Learning with Trees – Decision Trees – Constructing Decision Trees – Classification and Regression Trees – Ensemble Learning – Boosting – Bagging – Different ways to Combine Classifiers – Probability and Learning – Data into Probabilities – Basic Statistics – Gaussian Mixture Models – Nearest Neighbor Methods – Unsupervised Learning – K means Algorithms – Vector Quantization – Self Organizing Feature Map

UNIT IV   DIMENSIONALITY REDUCTION AND EVOLUTIONARY MODELS   9

Dimensionality Reduction – Linear Discriminant Analysis – Principal Component Analysis – Factor Analysis – Independent Component Analysis – Locally Linear Embedding – Isomap – Least Squares Optimization – Evolutionary Learning – Genetic algorithms – Genetic Offspring: - Genetic Operators – Using Genetic Algorithms – Reinforcement Learning – Overview – Getting Lost Example — Markov Decision Process

UNIT V   GRAPHICAL MODELS   9

Markov Chain Monte Carlo Methods – Sampling – Proposal Distribution – Markov Chain Monte
Carlo – Graphical Models – Bayesian Networks – Markov Random Fields – Hidden MarkovModels — Tracking Methods

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of this course, the students will be able to:

- Distinguish between, supervised, unsupervised and semi-supervised learning
- Apply the appropriate machine learning strategy for any given problem
- Suggest supervised, unsupervised or semi-supervised learning algorithms for any givenproblem
- Design systems that uses the appropriate graph models of machine learning
- Modify existing machine learning algorithms to improve classification efficiency

REFERENCES:

1 Ethem Alpaydin, ―Introduction to Machine Learning 3e (Adaptive Computation and MachineLearning Series)‖, Third Edition, MIT Press, 2014

2 Jason Bell, ―Machine learning – Hands on for Developers and Technical Professionals‖, FirstEdition, Wiley, 2014

3 Peter Flach, ―Machine Learning: The Art and Science of Algorithms that Make Sense of Data‖,First Edition, Cambridge University Press, 2012.

4 Stephen Marsland, ―Machine Learning — An Algorithmic Perspective‖, Second Edition,Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014.

| CP5201 | NETWORK DESIGN AND TECHNOLOGIES | L T P C |
| | | 3 0 0 3 |

OBJECTIVES:
- To understand the principles required for network design
- To explore various technologies in the wireless domain
- To study about 3G and 4G cellular networks
- To understand the paradigm of Software defined networks

UNIT I   NETWORK DESIGN   10

Advanced multiplexing – Code Division Multiplexing, DWDM and OFDM – Shared media networks – Switched networks – End to end semantics – Connectionless, Connection oriented, Wireless Scenarios –Applications, Quality of Service – End to end level and network level solutions. LAN cabling topologies – Ethernet Switches, Routers, Firewalls and L3 switches – Remote Access Technologies and Devices — Modems and DSLs — SLIP and PPP — Core networks, and distribution networks.

UNIT II   WIRELESS NETWORKS   9

IEEE802.16 and WiMAX – Security – Advanced 802.16 Functionalities – Mobile WiMAX -802.16e – Network Infrastructure – WLAN – Configuration – Management Operation – Security
– IEEE 802.11e and WMM – QoS – Comparison of WLAN and UMTS – Bluetooth – ProtocolStack — Security — Profiles

UNIT III   CELLULAR NETWORKS   9

GSM – Mobility Management and call control – GPRS – Network Elements – Radio ResourceManagement – Mobility Management and Session Management – Small Screen Web Browsing
over GPRS and EDGE – MMS over GPRS – UMTS – Channel Structure on the Air Interface –UTRAN –Core and Radio Network Mobility Management – UMTS Security

UNIT IV   4G NETWORKS   9

LTE – Network Architecture and Interfaces — FDD Air Interface and Radio Networks — Scheduling – Mobility Management and Power Optimization – LTE Security Architecture – Interconnection with UMTS and GSM – LTE Advanced (3GPPP Release 10) - 4G Networks and Composite Radio Environment – Protocol Boosters – Hybrid 4G Wireless Networks Protocols –Green Wireless Networks – Physical Layer and Multiple Access – Channel Modelling for 4G

UNIT V   SOFTWARE DEFINED NETWORKS   9

Introduction – Centralized and Distributed Control and Data Planes – Open Flow – SDNControllers – General Concepts – VLANs – NVGRE – Open Flow – Network Overlays – Types – Virtualization – Data Plane – I/O – Design of SDN Framework

TOTAL : 45 PERIODS

OUTCOMES:
Upon completion of this course, the students should be able to
- Identify the components required for designing a network
- Design a network at a high-level using different networking technologies
- Analyze the various protocols of wireless and cellular networks
- Discuss the features of 4G and 5G networks
- Experiment with software defined networks

REFERENCES:

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CP5292   **INTERNET OF THINGS**   L   T   P   C
                                                                       3   0   0   3

OBJECTIVES:
- To understand the fundamentals of Internet of Things
- To learn about the basics of IOT protocols
- To build a small low cost embedded system using Raspberry Pi.
- To apply the concept of Internet of Things in the real world scenario.

UNIT I   INTRODUCTION TO IoT   9
Internet of Things - Physical Design- Logical Design- IoT Enabling Technologies - IoT Levels & Deployment Templates - Domain Specific IoTs - IoT and M2M - IoT System Management with NETCONF-YANG- IoT Platforms Design Methodology

UNIT II   IoT ARCHITECTURE   9
M2M high-level ETSI architecture - IETF architecture for IoT - OGC architecture - IoT reference
model - Domain model - information model - functional model - communication model - IoTreference architecture

UNIT III   IoT PROTOCOLS   9
Protocol Standardization for IoT — Efforts — M2M and WSN Protocols — SCADA and RFID Protocols – Unified Data Standards – Protocols – IEEE 802.15.4 – BACNet Protocol – Modbus– Zigbee Architecture – Network layer – 6LowPAN - CoAP - Security

UNIT IV   BUILDING IoT WITH RASPBERRY PI & ARDUINO   9
Building IOT with RASPERRY PI- IoT Systems - Logical Design using Python — IoT Physical Devices & Endpoints - IoT Device -Building blocks -Raspberry Pi -Board - Linux on Raspberry Pi - Raspberry Pi Interfaces -Programming Raspberry Pi with Python - Other IoT Platforms - Arduino.

UNIT V   CASE STUDIES AND REAL-WORLD APPLICATIONS   9
Real world design constraints - Applications - Asset management, Industrial automation, smartgrid, Commercial building automation, Smart cities - participatory sensing - Data Analytics for IoT
— Software & Management Tools for IoT Cloud Storage Models & Communication APIs - Cloud
for IoT - Amazon Web Services for IoT.

TOTAL : 45 PERIODS

OUTCOMES:
Upon completion of this course, the students should be able to:
- Analyze various protocols for IoT
- Develop web services to access/control IoT devices.
- Design a portable IoT using Rasperry Pi
- Deploy an IoT application and connect to the cloud.
- Analyze applications of IoT in real time scenario

REFERENCES:
1. Arshdeep Bahga, Vijay Madisetti, ―Internet of Things – A hands-on approach‖,Universities Press, 2015

2. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), ―Architecting theInternet of Things‖, Springer, 2011.

3. Honbo Zhou, ―The Internet of Things in the Cloud: A Middleware Perspective‖, CRCPress, 2012.

4. Jan Ho¨ller, Vlasios Tsiatsis , Catherine Mulligan, Stamatis , Karnouskos, StefanAvesand. David Boyle, "From Machine-to-Machine to the Internet of Things -
Introduction to a New Age of Intelligence", Elsevier, 2014.

5. Olivier Hersent, David Boswarthick, Omar Elloumi , ―The Internet of Things – Keyapplications and Protocols‖, Wiley, 2012

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

CP5293   **BIG DATA ANALYTICS**   **L T P C** 3 0 0
                                                                                                    3

OBJECTIVES:
- To understand the competitive advantages of big data analytics
- To understand the big data frameworks
- To learn data analysis methods
- To learn stream computing
- To gain knowledge on Hadoop related tools such as HBase, Cassandra, Pig, and Hive forbig data analytics

UNIT I   INTRODUCTION TO BIG DATA   7
Big Data — Definition, Characteristic Features — Big Data Applications - Big Data vs Traditional Data - Risks of Big Data - Structure of Big Data - Challenges of Conventional Systems - Web Data — Evolution of Analytic Scalability - Evolution of Analytic Processes, Tools and methods - Analysis vs Reporting - Modern Data Analytic Tools

UNIT II   HADOOP FRAMEWORK   9
Distributed File Systems - Large-Scale FileSystem Organization – HDFS concepts - MapReduce Execution, Algorithms using MapReduce, Matrix-Vector Multiplication – Hadoop YARN

UNIT III   DATA ANALYSIS   13
Statistical Methods:Regression modelling, Multivariate Analysis - Classification: SVM & Kernel Methods - Rule Mining - Cluster Analysis, Types of Data in Cluster Analysis, Partitioning Methods,Hierarchical Methods, Density Based Methods, Grid Based Methods, Model Based Clustering Methods, Clustering High Dimensional Data - Predictive Analytics — Data analysis using R.

UNIT IV   MINING DATA STREAMS   7
Streams: Concepts — Stream Data Model and Architecture - Sampling data in a stream - Mining Data Streams and Mining Time-series data - Real Time Analytics Platform (RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

UNIT V   BIG DATA FRAMEWORKS   9
Introduction to NoSQL – Aggregate Data Models – Hbase: Data Model and Implementations – Hbase Clients – Examples – .Cassandra: Data Model – Examples – Cassandra Clients – Hadoop Integration. Pig – Grunt – Pig Data Model – Pig Latin – developing and testing Pig Latin scripts. Hive – Data Types and File Formats – HiveQL Data Definition – HiveQL Data Manipulation –HiveQL Queries

                                                                TOTAL: 45 PERIODS

OUTCOMES:
At the end of this course, the students will be able to:
- Understand how to leverage the insights from big data analytics
- Analyze data by utilizing various statistical and data mining approaches
- Perform analytics on real-time streaming data
- Understand the various NoSql alternative database models

REFERENCES:
1. Bill Franks, —Taming the Big Data Tidal Wave: Finding Opportunities in Huge DataStreams with Advanced Analytics‖, Wiley and SAS Business Series, 2012.
2. David Loshin, "Big Data Analytics: From Strategic Planning to Enterprise Integration withTools, Techniques, NoSQL, and Graph", 2013.
3. Michael Berthold, David J. Hand, —Intelligent Data Analysis‖, Springer, Second Edition,2007.
4. Michael Minelli, Michelle Chambers, and Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley,2013.
5. P. J. Sadalage and M. Fowler, "NoSQL Distilled: A Brief Guide to the Emerging World ofPolyglot Persistence", Addison-Wesley Professional, 2012.
6. Richard Cotton, "Learning R – A Step-by-step Function Guide to Data Analysis, , O'ReillyMedia, 2013.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

OBJECTIVES:

- To understand the concepts of virtualization and virtual machines
- To gain expertise in server, network and storage virtualization.
- To understand and deploy practical virtualization solutions and enterprise solutions
- To gain knowledge on the concept of virtualization that is fundamental to cloud computing
- To understand the various issues in cloud computing
- To be able to set up a private cloud
- To understand the security issues in the grid and the cloud environment

UNIT I   VIRTUALIZATION   9

Basics of Virtual Machines - Process Virtual Machines – System Virtual Machines –Emulation – Interpretation – Binary Translation - Taxonomy of Virtual Machines. Virtualization –Management Virtualization –– Hardware Maximization – Architectures – Virtualization Management – StorageVirtualization – Network Virtualization

UNIT II   VIRTUALIZATION INFRASTRUCTURE   9

Comprehensive Analysis – Resource Pool – Testing Environment –Server Virtualization – VirtualWorkloads – Provision Virtual Machines – Desktop Virtualization – Application Virtualization -Implementation levels of virtualization – virtualization structure – virtualization of CPU, Memory and I/O devices – virtual clusters and Resource Management – Virtualization for data centerautomation.

UNIT III   CLOUD PLATFORM ARCHITECTURE   9

Cloud deployment models: public, private, hybrid, community – Categories of cloud computing: Everything as a service: Infrastructure, platform, software- A Generic Cloud Architecture Design – Layered cloud Architectural Development – Virtualization Support and Disaster Recovery –Architectural Design Challenges - Public Cloud Platforms : GAE,AWS –– Inter-cloud ResourceManagement

UNIT IV   PROGRAMMING MODEL   9

Introduction to Hadoop Framework - Mapreduce, Input splitting, map and reduce functions, specifying input and output parameters, configuring and running a job –Developing Map Reduce Applications - Design of Hadoop file system –Setting up Hadoop Cluster - Cloud Software Environments -Eucalyptus, Open Nebula, Open Stack, Nimbus

UNIT V   CLOUD SECURITY   9

Cloud Infrastructure security: network, host and application level –– aspects of data security, provider data and its security, Identity and access management architecture, IAM practices in the cloud, SaaS, PaaS, IaaS availability in the cloud - Key privacy issues in the cloud –Cloud Security
and Trust Management

TOTAL : 45 PERIODS

OUTCOMES:

Upon completion of this course, the students should be able to:

- Employ the concepts of storage virtualization, network virtualization and its management
- Apply the concept of virtualization in the cloud computing
- Identify the architecture, infrastructure and delivery models of cloud computing
- Develop services using Cloud computing
- Apply the security models in the cloud environment

REFERENCES:

1. Danielle Ruest, Nelson Ruest, ―Virtualization: A Beginner‟s Guide‖, McGraw-Hill OsborneMedia, 2009.

2. Jim Smith, Ravi Nair , "Virtual Machines: Versatile Platforms for Systems and Processes",Elsevier/Morgan Kaufmann, 2005

3. John W.Rittinghouse and James F.Ransome, "Cloud Computing: Implementation,Management, and Security", CRC Press, 2010.

4. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, "Distributed and Cloud Computing, FromParallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.

5. Tim Mather, Subra Kumaraswamy, and Shahed Latif ,"Cloud Security and Privacy", O'ReillyMedia, Inc.,2009.

6. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", McGraw-Hill Osborne Media, 2009.

CP5005	**SOFTWARE QUALITY ASSURANCE AND TESTING**	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the basics of testing, test planning &design and test team organization
- To study the various types of test in the life cycle of the software product.
- To build design concepts for system testing and execution
- To learn the software quality assurance ,metrics, defect prevention techniques
- To learn the techniques for quality assurance and applying for applications**.**

UNIT I   SOFTWARE TESTING - CONCEPTS, ISSUES, AND TECHNIQUES   9

Quality Revolution, Verification and Validation, Failure, Error, Fault, and Defect, Objectives of Testing, Testing Activities, Test Case Selection White-Box and Black ,test Planning and design, Test Tools and Automation, . Power of Test. Test Team Organizationand Management**-**Test Groups, Software Quality Assurance Group ,System Test Team Hierarchy, Team Building.

UNIT II   SYSTEM TESTING   9

System Testing - System Integration Techniques-Incremental, Top Down Bottom Up Sandwich and Big Bang, Software and Hardware Integration, Hardware Design Verification Tests, Hardware and Software Compatibility Matrix Test Plan for System Integration. Built- in Testing. functional testing - Testing a Function in Context. Boundary Value Analysis, Decision Tables. acceptance testing - Selection of Acceptance Criteria, Acceptance Test Plan, Test Execution Test. software reliability - Fault and Failure, Factors InfluencingSoftware, Reliability Models

UNIT III   SYSTEM TEST CATEGORIES   10

System test categories Taxonomy of System Tests,   Interface Tests Functionality Tests. GUI Tests, Security Tests Feature Tests, Robustness Tests, Boundary Value Tests Power Cycling Tests Interoperability Tests, Scalability Tests, Stress Tests, Load and Stability Tests, Reliability Tests, Regression Tests, Regulatory Tests.
Test Generation from FSM models**-** State-Oriented Model. Finite-State Machine TransitionTour Method, Testing with State Verification. Test Architectures-Local, distributed, Coordinated, Remote. system test design- Test Design Factors Requirement Identification, modeling a Test Design Process Test Design Preparedness, Metrics, Test Case Design Effectiveness. system test execution- Modeling Defects, Metrics for Monitoring Test Execution .Defect Reports, Defect Causal Analysis, Beta testing, measuring TestEffectiveness.

UNIT IV   SOFTWARE QUALITY   8

Software quality - People's Quality Expectations**,** Frameworks and ISO-9126, McCall's Quality Factors and Criteria — Relationship. Quality Metrics. Quality Characteristics ISO 9000:2000 Software Quality Standard. Maturity models**-** Test Process Improvement ,TestingMaturity Model.

UNIT V   SOFTWARE QUALITY ASSURANCE   9

Quality Assurance - Root Cause Analysis, modeling, technologies, standards and methodologies for defect prevention. Fault Tolerance and Failure Containment - Safety Assurance and Damage Control, Hazard analysis using fault-trees and event-trees. Comparing Quality Assurance Techniques and Activities**.** QA Monitoring and Measurement, Risk Identification for Quantifiable Quality Improvement. Case Study: FSM-Based Testing ofWeb-Based Applications.

TOTAL :45 PERIODS

OUTCOMES:

Upon completion of this course, the students should be able to

- Perform functional and nonfunctional tests in the life cycle of the software product.
- Understand system testing and test execution process.
- Identify defect prevention techniques and software quality assurance metrics.
- Apply techniques of quality assurance for typical applications.

REFERENCES:

1.   Software Testing And Quality Assurance-Theory and Practice, Kshirasagar NakPriyadarshi Tripathy, John Wiley & Sons Inc,2008

2.   Software Quality Engineering: Testing, Quality Assurance, and Quantifiable Improvement, Jeff Tian, John Wiley & Sons, Inc., Hoboken, New Jersey. 2005.

3.   Software Quality Assurance - From Theory to Implementation, Daniel Galin,Pearson Education Ltd UK, 2004

4.   Software Quality Assurance, Milind Limaye, TMH ,New Delhi, 2011

OBJECTIVES:
- To understand the architecture of embedded processor, microcontroller and peripheraldevices.
- To interface memory and peripherals with embedded systems.
- To study the embedded network environment.
- To understand challenges in Real time operating systems.
- To study, analyze and design applications on embedded systems.

UNIT I   EMBEDDED PROCESSORS   9
Embedded Computers - Characteristics of Embedded Computing Applications - Challenges in Embedded Computing System Design - Embedded System Design Process- Formalism for System Design - Structural Description - Behavioural Description - ARM Processor - Intel ATOM Processor.

UNIT II   EMBEDDED COMPUTING PLATFORM   9
CPU Bus Configuration - Memory Devices and Interfacing - Input/Output Devices and Interfacing -System Design - Development and Debugging — Emulator — Simulator - JTAG Design Example —Alarm Clock - Analysis and Optimization of Performance - Power and Program Size.

UNIT III   EMBEDDED NETWORK ENIVIRONMENT   9
Distributed Embedded Architecture - Hardware And Software Architectures - Networks for Embedded Systems - I2C - CAN Bus - SHARC Link Supports — Ethernet — Myrinet — Internet - Network-based Design - Communication Analysis - System Performance Analysis - Hardware Platform Design - Allocation and Scheduling - Design Example - Elevator Controller.

UNIT IV   REAL-TIME CHARACTERISTICS   9
Clock Driven Approach - Weighted Round Robin Approach - Priority Driven Approach - Dynamic versus Static Systems - Effective Release Times and Deadlines - Optimality of the EarliestDeadline First (EDF) Algorithm - Challenges in Validating Timing Constraints in Priority Driven Systems - Off-Line versus On-Line Scheduling.

UNIT V   SYSTEM DESIGN TECHNIQUES   9
Design Methodologies - Requirement Analysis — Specification - System Analysis and Architecture Design - Quality Assurance - Design Examples - Telephone PBX - Ink jet printer - Personal DigitalAssistants - Set-Top Boxes.

TOTAL: 45 PERIODS

OUTCOME:
Upon completion of the course, the students should be able to
- Understand different architectures of embedded processor, microcontroller and peripheraldevices. Interface memory and peripherals with embedded systems.
- Work with embedded network environment.
- Understand challenges in Real time operating systems.
- Design and analyze applications on embedded systems.

REFERENCES:
1. Adrian McEwen, Hakim Cassimally, "Designing the Internet of Things" Wiley Publication, Firstedition, 2013
2. Andrew N Sloss, D. Symes, C. Wright, ‖ Arm system developers guide‖, MorganKauffman/Elsevier, 2006.
3. ArshdeepBahga, Vijay Madisetti, " Internet of Things: A Hands-on-Approach" VPT FirstEdition, 2014
4. C. M. Krishna and K. G. Shin, —Real-Time Systems‖ , McGraw-Hill, 1997
5. Frank Vahid and Tony Givargis, —Embedded System Design: A Unified Hardware/SoftwareIntroduction‖, John Wiley & Sons.
6. Jane.W.S. Liu, —Real-Time systems‖, Pearson Education Asia.
7. Michael J. Pont, —Embedded C‖, Pearson Education , 2007.
8. Muhammad   Ali   Mazidi , SarmadNaimi , SepehrNaimi,"The AVR Microcontroller and Embedded Systems: Using Assembly and C" Pearson Education, First edition, 2014
9. Steve Heath, —Embedded SystemDesign‖ , Elsevier, 2005
10. Wayne Wolf, —Computers as Components:Principles of Embedded Computer SystemDesign‖, Elsevier, 2006.

CP5097	MOBILE APPLICATION DEVELOPMENT	L	T	P	C
		3	0	0	3

OBJECTIVES:

- Understand system requirements for mobile applications.
- Generate suitable design using specific mobile development frameworks.
- Generate mobile application design.
- Implement the design using specific mobile development frameworks.
- Deploy the mobile applications in marketplace for distribution.

UNIT I   INTRODUCTION   5

Introduction to mobile applications – Embedded systems - Market and business drivers for mobile applications – Publishing and delivery of mobile applications – Requirementsgathering and validation for mobile applications.

UNIT II   BASIC DESIGN   8

Introduction – Basics of embedded systems design – Embedded OS - Design constraints for mobile applications, both hardware and software related – Architecting mobile applications – User interfaces for mobile applications – touch events and gestures – Achieving quality constraints – performance, usability, security, availability and modifiability.

UNIT III   ADVANCED DESIGN   8

Designing applications with multimedia and web access capabilities – Integration with GPS and social media networking applications – Accessing applications hosted in a cloud computing environment – Design patterns for mobile applications.

UNIT IV   ANDROID   12

Introduction – Establishing the development environment – Android architecture – Activities and views – Interacting with UI – Persisting data using SQLite – Packaging and deployment – Interaction with server side applications – Using Google Maps, GPS andWifi – Integration with social media applications.

UNIT V   IOS   12

Introduction to Objective C – iOS features – UI implementation – Touch frameworks –Data persistence using Core Data and SQLite – Location aware applications using Core
Location and Map Kit – Integrating calendar and address book with social mediaapplication – Using Wifi - iPhone marketplace.

TOTAL :45 PERIODS

OUTCOMES:
Upon completion of the course, the students should be able to:

- Describe the requirements for mobile applications.
- Explain the challenges in mobile application design and development.
- Develop design for mobile applications for specific requirements.
- Implement the design using Android SDK.
- Implement the design using Objective C and iOS.
- Deploy mobile applications in Android and iPhone marketplace for distribution.

FACE RECOGNITION FROM CONTAMINATED SAMPLE ON SINGLE PERSON USING IMPROVED SYNERGISTIC GENERIC LEARNING

PHASE II REPORT

Submitted by

P. GANGA

(Register No: 621118405002)

in partial fulfillment for the award of the degree of

MASTER OF ENGINEERING

IN

Computer Science and Engineering

IDHAYA ENGINEERING COLLEGE FOR WOMEN,

CHINNASALEM

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ANNA UNIVERSITY, CHENNAI

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this Report titled **"FACE RECOGNITION FROM CONTAMINATED SAMPLE ON SINGLE PERSON USING IMPROVED SYNERGISTIC GENERIC LEARNING"** is bonafide work of **P. GANGA** (Register No: 621118405002) who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Dr. S. Jayasundar M.E., Ph.D., M.B.A

Associate Professor & Head

Department of Computer Science and
Engineering

Idhaya Engineering College for Women

Chinnasalem-606 201.

SIGNATURE

Mrs. K. Gandhimathi M.E.

Associate Professor

Department of Computer Science and
Engineering

Idhaya Engineering College for Women

Chinnasalem-606 201.

Submitted for the Project Phase II viva voce held on 25.09.2020

INTERNAL EXAMINER

EXTERNAL EXAMINER

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Single sample per person face recognition (SSPP FR), with a single face image only for training, has several attractive potential applications, but is still a challenging problem. Existing generic learning methods usually leverage prototype plus variation (P+V) model for SSPP FR provided that face samples in the biometric enrolment database are variation-free, and thus can be treated as the prototypes of data subjects. However, this condition is not satisfied when these samples are contaminated by nuisance facial variations in the wild such as varied expressions, poor lightings and disguises (e.g., wearing scarf). Moreover, the generated variation dictionary also needs to be enhanced because it is simply based on the subtraction of average face from samples of the same data subject in the generic set and thus containing individual characteristics that can hardly be shared by other data subjects. To address these two issues, proposal of novel Synergistic Generic Learning (SGL) method to study the SSPP-ce FR problem. Compared with the existing generic learning methods, SGL develops a new "learned P + learned V" model to identify new query samples. Specifically, it learns better prototypes for the contaminated samples in the biometric enrolment database by preserving their more discriminative subject-specific portions, and learns a representative variation dictionary by extracting the less discriminative intra-subject variants from an auxiliary generic set.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

LARGE-SCALE IMAGE DATABASE HASHING WITH DECOMPOSITION

PHASE II REPORT

Submitted by

R.ISHWARYA

(Register No: 621118405004)

In partial fulfillment for the award of the degree of

MASTER OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

DEPARTMENT OF COMPUTER SCIENCE AND

ENGINEERING

ANNA UNIVERSITY, CHENNAI 600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this report titled **"LARGE-SCALE IMAGE DATABASE HASHING WITH DECOMPOSITION"** is the bonafide work of **"R.ISHWARYA (621118405004)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.
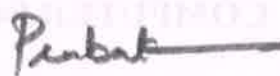
SIGNATURE

Dr.S.JAYASUNDARM.E.,Ph.D.,M.B.A.,

Associate Professor and Head

Department of Computer Science and Engineering

Idhaya Engineering College for Women
Chinnasalem-606 201

SIGNATURE

Sr.C.JANSI SOPHIA MARY M.E.,(Ph.D)

Associate Professor

Department of Computer Science and Engineering

Idhaya Engineering College for Women
Chinnasalem-606 201

Submitted for the project phase I viva voce held on 25.09.2020

INTERNAL EXAMINER

EXTERNALEXAMINER

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Image hashing that is designed with Tensor Decomposition (TD), referred to as TD hashing, where image hash generation is viewed as deriving a compact representation from a tensor. Specifically, a stable three-order tensor is first constructed from the normalized image, so as to enhance the robustness of our TD hashing. A popular TD algorithm, called Tucker decomposition, is then exploited to decompose the three-order tensor into a core tensor and three orthogonal factor matrices. As the factor matrices can reflect intrinsic structure of original tensor, hash construction with the factor matrices makes a desirable discrimination of the TD hashing. To examine these claims, there are 14,551 images selected for our experiments. A receiver operating characteristics (ROC) graph is used to conduct theoretical analysis and the ROC comparisons illustrate that the TD hashing outperforms some state-of-the-art algorithms in classification performance between the robustness and discrimination.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

AN EFFICIENT REGION BASED IMAGE RETRIEVAL USING FUZZY C MEANS ALGORITHM AND USER INTERACTIVE MULTI THRESHOLD ROBUST FEATURES VECTOR

PHASE II REPORT

Submitted by

S. MAHESHWARI

(Register No: 621118405005)

In partial fulfillment for the award of the degree of

MASTER OF ENGINEERING IN

COMPUTER SCIENCE AND ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

DEPARTMENT OF COMPUTER SCIENCE AND

ENGINEERING

ANNA UNIVERSITY, CHENNAI 600 025

APRIL 2020

Dr.R.GURUMANI, M.E., Ph.D., M.B.A., M.ISTE., F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this report titled **"AN EFFICIENT REGION BASED IMAGE RETRIEVAL USING FUZZY C MEANS ALGORITHM AND USER INTERACTIVE MULTI THRESHOLD ROBUST FEATURES VECTOR"** is the bonafide work of **"S.MAHESHWARI (621118405005)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Dr.S.JAYASUNDAR
M.E.,Ph.D.,M.B.A.,
Associate Professor and Head
Department of Computer Science and
Engineering
Idhaya Engineering College for Women
Chinnasalem-606 201

SIGNATURE

Mr.S.PRABAKARAN M.E.,
Assistant Professor
Department of Computer Science and
Engineering
Idhaya Engineering College for Women
Chinnasalem-606 201

Submitted for the project phase I viva voice held on   25.09.2020

INTERNAL EXAMINER

EXTERNAL EXAMINER

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Remote Sensing Image processing is a technique to change an image into digital form and execute a number of operations on it, in order to obtain an improved image or to extract a number of useful information from it. It is a huge and demanding area with its applications in fields like aerial, medical and industrial applications, satellite images, and science and law enforcement. Frequently the image quality is more often linked to its brightness and contrast levels increasing these parameters will certainly provide the most excellent result. HE is an image enhancement technique that allocates the values of pixel consistently, therefore developing an improved picture. The major problem of color histogram equalization method of SVM is that it does not yield uniform histogram in gray scale transformation of 3D DWT. The scarcity of multi-image supporting for satellite image is handled with the help of multispectral sensing image method. A satellite image is full of noisy information thus it faces many problems just to get a clear view of a location. Various image enhancement techniques are used to remove the unwanted data from the satellite image. Existing techniques fail to clear noise from the satellite image enough to be used for real time purposes. Therefore following methods are proposed to overcome above issues. SVM is proposed which has two significant parts. The first one is the interior point method and second one is boundary value selection. The majority of color histogram equalization methods do not yield uniform histogram in gray scale. Contrast of the converted image is worse in 1D and 2D, to overcome this we move on to 3D. The new satellite image contrast enhancement technique is based on the discrete wavelet transform (DWT) which decomposes the input image into the four frequency sub bands by using DWT and estimates the singular value matrix of the low- low sub band image, and, then, it reconstructs the enhanced image by applying inverse DWT.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT

PACKET FORWARDING IN UNRELIABLE WIRELESS LINK USING COOPERATIVE FORWARDING STRATEGY

PHASE II REPORT

Submitted by

A. MERLIN CLARA

(Register No: 621118405006)

In partial fulfillment for the award of the degree of

MASTER OF ENGINEERING IN

COMPUTER SCIENCE AND ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

DEPARTMENT OF COMPUTER SCIENCE AND

ENGINEERING

ANNA UNIVERSITY, CHENNAI 600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this report titled **"PACKET FORWARDING IN UNRELIABLE WIRELESS LINK USING COOPERATIVE FORWARDING STRATEGY"** is the bonafide work of **"A.MERLIN CLARA (621118405006)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Dr.S.JAYASUNDAR M.E.,Ph.D.,M.B.A.,

Associate Professor and Head

Department of Computer Science and

Engineering

Idhaya Engineering College for Women

Chinnasalem-606 201

SIGNATURE

Mr.S.JAYAPRAKASH M.E.,(Ph.D)

Associate Professor

Department of Computer Science and

Engineering

Idhaya Engineering College for Women

Chinnasalem-606 201

Submitted for the project phase I viva voce held on 25.09.2020

INTERNAL EXAMINER

EXTERNAL EXAMINER

Dr.R.GURUMANI, M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

In wireless ad hoc networks security is a big challenge due to the lack of any infrastructure support, dynamic network topology, shared radio medium, and resource-restraint wireless users. Most existing security mechanisms applied for the Internet or basic wireless networks are neither applicable nor suitable for wireless ad hoc network environments. In Mobile Ad Hoc Networks, routing security is an extremely important issue, as the majority of the standard routing protocols imagine non-hostile surroundings. Once installed in a hostile environment and working in an unattended mode, prevailing routing protocols are accessible to several attacks. Existing work on sensing coverage mainly focus on how attain a needed coverage, using the minimum number of sensors while security constraints are not sufficiently addressed. In this thesis, two effective pair wise key pre-distribution and management mechanisms are proposed for both distributed and hierarchical large-scale Wireless Sensor Networks, and they enable establishing secure links between any two sensors nodes located within their communication range, based on random graph theory and a realistic random key pre-distribution systems, in order to attain both robust sensing coverage and secure connectivity simultaneously in a hostile deployment environment.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

INDUSTRIAL BIG DATA CHALLENGES AND ANALYTICAL METHODS FOR DATA ACQUISITION

PHASE II REPORT

Submitted by

V.SANGEETHA

(Register No: 621118405007)

In partial fulfillment for the award of the degree of

MASTER OF ENGINEERING IN

COMPUTER SCIENCE AND ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

DEPARTMENT OF COMPUTER SCIENCE AND

ENGINEERING

ANNA UNIVERSITY, CHENNAI 600 025

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,FIE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this report titled **"INDUSTRIAL BIG DATA CHALLENGES AND ANALYTICAL METHODS FOR DATA ACQUISITION"** is the bonafide work of **"V.SANGEETHA (621118405007)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Dr.S.JAYASUNDAR M.E.,Ph.D.,M.B.A.,
Associate professor and Head
Department of Computer Science and
Engineering
Idhaya Engineering College for Women
Chinnasalem-606 201

SIGNATURE

Sr.J.AROCKIA JAYA M.E.,(Ph.D.,)
Associate professor
Department of Computer Science and
Engineering
Idhaya Engineering College for Women
Chinnasalem-606 201

Submitted for the project phase II viva voce held on 25.09.2020

INTERNAL EXAMINER

EXTERNAL EXAMINER

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

While manufacturers have been generating highly distributed data from various systems, devices and applications, a number of challenges in both data management and data analysis require new approaches to support the big data era. These challenges for industrial big data analytics is real-time analysis and decision making from massive heterogeneous data sources in manufacturing space. This survey presents new concepts, methodologies, and applications scenarios of industrial big data analytics, which can provide dramatic improvements in velocity and veracity problem solving. We also provided the five typical applied cases of industrial big data, which including smart factory visibility, machine fleet, energy management, proactive maintenance, and just in time supply chain. These newly methodologies and typical applied case will not only help manufacturers make more relevant and valuable decisions, but also provide capability of predictive manufacturing and service innovations. This survey also provides a comprehensive review of important technology in industrial big data analytics of related works to date, which hopefully will be a useful resource for further industrial big data analytics research.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

IMPROVING EFFICIENCY IN GENERATION OF HIDDEN SECRET MOSAIC IMAGE WITH PARALLELISM USING DISTRIBUTED MEMORY ARCHITECTURE

PHASE II REPORT

Submitted by

S. SOUNDARYA

(Register No: 621118405008)

in partial fulfillment for the award of the degree of

MASTER OF ENGINEERING

IN

Computer Science and Engineering

IDHAYA ENGINEERING COLLEGE FOR WOMEN,

CHINNASALEM

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ANNA UNIVERSITY, CHENNAI

APRIL 2020

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201, KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this Report titled "**IMPROVING EFFICIENCY IN GENERATION OF HIDDEN SECRET MOSAIC IMAGE WITH PARALLELISM USING DISTRIBUTED MEMORY ARCHITECTURE**" is the bonafide work of **S. SOUNDARYA** (Register No: 621118405008) who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Dr. S. Jayasundar M.E., Ph.D., M.B.A

Associate Professor & Head

Department of Computer Science and
Engineering

Idhaya Engineering College for Women

Chinnasalem-606 201.

SIGNATURE

Mr. S. Jaya Prakash M.E., (Ph.D)

Associate Professor

Department of Computer Science and
Engineering

Idhaya Engineering College for Women

Chinnasalem-606 201.

Submitted for the Project Phase II viva voce held on <u>25.09.2020</u>

INTERNAL EXAMINER

EXTERNAL EXAMINER

Dr.R.GURUMANI, M.E., Ph.D., M.B.A., M.ISTE., F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

The effect of information hiding is useful for covert communication or secure keeping of secret images. To create a mosaic image of this type from a given secret color image, the 3-D color space is transformed into a new 1-D colorscale, based on which a new image similarity measure is proposed for selecting from a database a target image that is the most similar to the given secret image. A fast greedy search algorithm is proposed to find a similar tile image in the secret image to fit into each block in the target image. The information of the tile image fitting sequence is embedded into randomly selected pixels in the created mosaic image by a lossless LSB replacement scheme using a secret key for recovering However, with the rapid growth of the amount of raster image data, the traditional mosaic method cannot meet the actual needs of rapid processing under the current data volume. For this, an image mosaic algorithm based on MPI parallel framework is proposed. By partitioning the raster data, the image mosaic process is parallelized by multi-process, and the conflict between reading and writing is resolved to realize fast and reliable mosaic. In this project a new proposal is identified as using distributed memory for parallel processing ahead of using shared memory so that there will be improvement in parallelism operation.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

PERSONAL IDENTIFICATION BASED ON RETINAL BLOOD VESSEL SEGMENTATION IN DEEP LEARNING

PHASE II REPORT

Submitted by

N. SWATHIPRIYA

(Register No: 621118405009)

In partial fulfillment for the award of the degree of

MASTER OF ENGINEERING IN

COMPUTER SCIENCE AND ENGINEERING

IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM

DEPARTMENT OF COMPUTER SCIENCE AND

ENGINEERING

ANNA UNIVERSITY, CHENNAI 600 025

APRIL 2020

Dr.R.GURUMANI, M.E., Ph.D., M.B.A., M.ISTE., F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this report titled **"PERSONAL IDENTIFICATION BASED ON RETINAL BLOOD VESSEL SEGMENTATION IN DEEP LEARNING"** is the bonafide work of **"N.SWATHIPRIYA (621118405009)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.
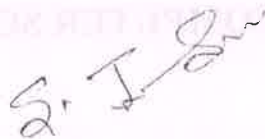
SIGNATURE

Dr.S.JAYASUNDAR M.E.,Ph.D.,M.B.A.,

Associate Professor and Head

Department of Computer Science and Engineering

Idhaya Engineering College for Women

Chinnasalem-606 201

SIGNATURE

Dr.S.JAYASUNDAR M.E.,Ph.D.,M.B.A.,

Associate Professor

Department of Computer Science and Engineering

Idhaya Engineering College for Women

Chinnasalem-606 201

Submitted for the project phase I viva voice held on ____25.09.2020____

INTERNAL EXAMINER

EXTERNAL EXAMINER

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,F.IE.,
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.

ABSTRACT

Biometric system is a pattern-recognition system that recognizes a person based on the personal physiological or behavioural characteristics that the person possesses. Human retina, one source of biometric provides the most reliable and with the emerging potentials of automated image processing a highly secure means of authentication is possible. The proposed system describes the development of segmentation methodology in the processing of retinal blood vessel image obtained using fundus colour photography. It is a personal identification system based on the vascular pattern of human retina consisting of three stages; i.e. preprocessing, feature extraction and finally the classification process. The colour fundus retinal image is acquired from the medical fundus camera from which the blood vessel pattern is segmented using morphological operations with the disc shaped structuring element.

Dr.R.GURUMANI,M.E.,Ph.D.,M.B.A.,M.ISTE.,r.It.
PRINCIPAL
IDHAYA ENGG. COLLEGE FOR WOMEN
CHINNASALEM-606 201. KALLAKURICHI DT.