1.3.2

COURSES THAT INCLUDE EXPERIENTIAL LEARNING THROUGH

PROJECT WORK/

FIELD WORK/

INTERNSHIP DURING

2021-2022

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1.3.2 AVERAGE PERCENTAGE OF COURSES THAT INCLUDE EXPERIENTIAL LEARNING THROUGH PROJECT WORK/FIELD WORK/INTERNSHIP DURING 2021-2022

S.No	Programme offering	Name of the course	Course Code	Project/ Field work/ Internship	Page No
1.	B.E-Computer Science & Engineering	Problem Solving and Python Programming	GE3151	Industrial Visit	03
2.	B.E-Computer Science & Engineering	Physics For Information Science	PH3256	Industrial Visit	12
3.	B.E-Computer Science & Engineering	Basic Electrical Electronics and Measurement Engineering	BE3251	Industrial Visit	21
4.	B.E-Computer Science & Engineering	Programming In C	CS3251	Industrial Visit	30
5.	B.E-Computer Science & Engineering	Digital Principles and System Design	CS8351	Internship	39
6.	B.E-Computer Science & Engineering	Data Structures	CS8391	Field work	41
7.	B.E-Computer Science & Engineering	Object Oriented Programming	CS8392	Internship	43
8.	B.E-Computer Science & Engineering	Communication Engineering	EC8395	Internship	46
9.	B.E-Computer Science & Engineering	Computer Architecture	CS8491	Field work	48
10	B.E-Computer Science & Engineering	Database Management Systems	CS8492	Project	50
11	B.E-Computer Science & Engineering	Design And Analysis of Algorithms	CS8451	Field work	55
12	B.E-Computer Science & Engineering	Operating Systems	CS8493	Field work	58
13	B.E-Computer Science & Engineering	Software Engineering	CS8494	Internship	61
14	B.E-Computer Science & Engineering	Computer Networks	CS8591	Internship	64
15	B.E-Computer Science & Engineering	Theory Of Computation	CS8501	Field work	66
16	B.E-Computer Science & Engineering	Object Oriented Analysis and Design	CS8592	Field work	68
17	B.E-Computer Science & Engineering	World Class Manufacturing	OIM551	Internship	71
18	B.E-Computer Science & Engineering	Internet Programming	CS8651	Field work	73
19	B.E-Computer Science & Engineering	Artificial Intelligence	CS8691	Project	76

S.No	Programme offering	Name of the course	Course Code	Project/ Field work/ Internship	Page No
20	B.E-Computer Science & Engineering	Mobile Computing	CS8601	Project	80
21	B.E-Computer Science & Engineering	Compiler Design	CS8602	Internship	84
22	B.E-Computer Science & Engineering	Distributed Systems	CS8603	Field work	87
23	B.E-Computer Science & Engineering	Software Testing	IT8076	Field work	90
24	B.E-Computer Science & Engineering	Cryptography And Network Security	CS8792	Project	92
25	B.E-Computer Science & Engineering	Cloud Computing	CS8791	Project	96
26	B.E-Computer Science & Engineering	Robotics	OIE751	Field work	100
27	B.E-Computer Science & Engineering	Total Quality Management	GE8077	Field work	102
28	B.E-Computer Science & Engineering	Human Computer Interaction	CS8079	Internship	104
29	B.E-Computer Science & Engineering	Professional Ethics in Engineering	GE8076	Field work	106
30	B.E-Computer Science & Engineering	Green Computing	CS8078	Internship	108
31	B.E-Computer Science & Engineering	Project Work	CS8811	Project	111

Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

COURSE OBJECTIVES:
- To understand the basics of algorithmic problem solving.
- To learn to solve problems using Python conditionals and loops.
- To define Python functions and use function calls to solve problems.
- To use Python data structures - lists, tuples, dictionaries to represent complex data.
- To do input/output with files in Python.

UNIT I   COMPUTATIONAL THINKING AND PROBLEM SOLVING   9

Fundamentals of Computing – Identification of Computational Problems -Algorithms, building blocks ofalgorithms (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 a card ina list of sorted cards, guess an integer number in a range, Towers of Hanoi.

UNIT II   DATA TYPES, EXPRESSIONS, STATEMENTS   9

Python interpreter and interactive mode, debugging; values and types: int, float, boolean, string, a nd list; variables, expressions, statements, tuple assignment, precedence of operators, comments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distancebetween two points.

UNIT III   CONTROL FLOW, FUNCTIONS, STRINGS   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, binarysearch.

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: simple sorting, histogram, Students marks statement, Retail bill preparation.

UNIT V   FILES, MODULES, PACKAGES   9

Files and exceptions: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file, Voter's age validation, Marks range validation (0-100).

TOTAL : 45 PERIODS

COURSE OUTCOMES:

Upon completion of the course, students will be able to

CO1: Develop algorithmic solutions to simple computational problems.

CO2: Develop and execute simple Python programs.

CO3: Write simple Python programs using conditionals and loops for solving problems.

CO4: Decompose a Python program into functions.

CO5: Represent compound data using Python lists, tuples, dictionaries etc.

CO6: 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, O'Reilly Publishers, 2016.

2. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited, 2017.

REFERENCES:

1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021 .

2. G Venkatesh and Madhavan Mukund, "Computational Thinking: A Primer for Programmers and Data Scientists", 1st Edition, Notion Press, 2021.

3. John V Guttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data", Third Edition, MIT Press, 2021

4. Eric Matthes, "Python Crash Course, A Hands - on Project Based Introduction to Programming",2nd Edition, No Starch Press, 2019.

5. https://www.python.org/

6. Martin C. Brown, "Python: The Complete Reference", 4th Edition, Mc-Graw Hill, 2018.

Dr. J.SUNDARARAJAN,
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PERMISSION LETTER

From

Dr. T. Priya,

Head of the Department,

Department of Science and Humanities,

NPR College of Engineering & Technology,

Natham,

Dindigul – 624 401.

To

The Administrative Office,

NPR Group of Institutions,

Natham,

Dindigul – 624 401.

Through Proper Channel

Sir,

Sub: Requesting permission for Industrial visit – Reg.

This is to bring to your kind notice that we are planning to organize one day visit to **VEI Technologies** for the 1st Year students.

So, I request you to grant permission for 80 students from I Year (60 Boys & 20 Girls)and 2 staff members (Mr. P. Madasamy, AP/ Maths and Mrs.S.Visithra, AP/ Maths) on 18.12.2021to visit **VEI Technologies, Chennai.**

Kindly do the needful.

Thanking you,

Yours faithfully,

Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

(Dr.T.Priya)

2

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REQUISITION LETTER

Gmail

Inbox

NPR S&H<hodmathematicsnprcet@gmail.com>

To: info@veitecnologies.com

Mon, DEC 13, 2021,
10.16 AM

Respected Sir,

Greetings...!

Our NPR College of engineering and technology is situated in Natham, Dindigul district in a lush green environment established with the objective of ensuring the personal and professional development of the students from rural backgrounds offering UG and PG courses.

It has been a regular practice in our Science and Humanities Department to arrange industrial visits for our students every semester to reputed engineering industries. Based on that, 40 I YEAR students and 2 staff members of our Science and Humanities department have planned to visit VEI **Technologies**. We assure you sir, our students will follow the safety rules and will not disturb your regular processes. We humbly request you to grant us permission for the same and to confirm the permission through letter or mail.

Thanks, and regards

Dr. T. Priya,

Professor & Head

Department of Science and Humanities,

NPRCET,

Natham.

Reply Forward

NPR College of Engineering & Technology

NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.
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CONFIRMATION LETTER FROM INDUSTRY

NPR S&H<hodmathematicsnprcet@gmail.com>

To: info@veitecnologies.com

Mon, DEC 13, 2021,
10.16 AM

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Thanks, and regards

Dr. T. Priya,

Prof & HOD,

Department of Science and Humanities,

NPRCET,

Natham.

Reply Forward

Gmail

Inbox

info@veitechnologies.com

Wed, Dec 15,2021, 12.28 PM

To: hodmathematicsnprcet@gmail.com

Dear Madam,

We are happy to give permission for the industrial visit to your wards in VEI Technologies, Chennai. Kindly remind us one day in advance for the visit schedule also send the original letter copy with your hand during the visit.

Thanks and Regards,

Dr B Ezhilavan,

Managing Director,

VEI Technologies, Chennai.

Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

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Industrial Visit to VEI Technologies, Chennai
DEPARTMENT OF SCIENCE AND HUMANITIES
STUDENTS LIST

PLACE OF INDUSTRIAL VISIT: VEI Technologies, Chennai   DATE: 18.12.2021

S. NO	NAME OF THE STUDENT	DEPARTMENT	GENDER	SIGNATURE
1.	JEEVADHARANI P	EEE	FEMALE	
2.	LOGESH KUMAR B	EEE	MALE	
3.	LOGESHWARAN S	EEE	MALE	
4.	MOHAMED THOUFEEK	EEE	MALE	
5.	RAMYA M	EEE	FEMALE	
6.	SANTHOSH A	EEE	MALE	
7.	SANTHOSH KUMAR R	EEE	MALE	
8.	JEYAVARTYIHINI	EEE	FEMALE	
9.	KEERTHIKA P	EEE	FEMALE	
10.	LAARADOLLY S	EEE	FEMALE	
11.	KIRTHIKANANTH M	CSE	MALE	
12.	MOHAMMED ABDULA S	CSE	MALE	
13.	MUTHUARIVU K	CSE	MALE	
14.	PRAVEEN C	CSE	MALE	
15.	RAGHUL S P	CSE	MALE	
16.	AARIF H	CSE	MALE	
17.	AJAY KUMAR K	CSE	MALE	
18.	ANBARASAN P	CSE	MALE	
19.	ANBARASU S	CSE	MALE	
20.	ANBULINGAM E	CSE	MALE	
21.	APSARA JASMINE S	CSE	FEMALE	
22.	ARASUTHANGAPANDI M	CSE	MALE	
23.	ARUSHA BANU A	CSE	FEMALE	
24.	BABY SHALINI C	CSE	FEMALE	
25.	DHARANI T	CSE	FEMALE	
26.	SUSMITHA N	CSE	FEMALE	
27.	THESHAN BANU S	CSE	FEMALE	
28.	DHARANI R	ECE-A	FEMALE	
29.	DHARSHINI B	ECE-A	FEMALE	
30.	DIVYA DHARSINI G	ECE-A	FEMALE	
31.	DURGA S	ECE-A	FEMALE	
32.	GANESAN M	ECE-A	MALE	
33.	GOPINATH S	ECE-A	MALE	
34.	HARESHKUMAR K	ECE-A	MALE	
35.	HARIHARAN R	ECE-A	MALE	
36.	MOHAMED IMTHIYAS K	ECE-A	MALE	

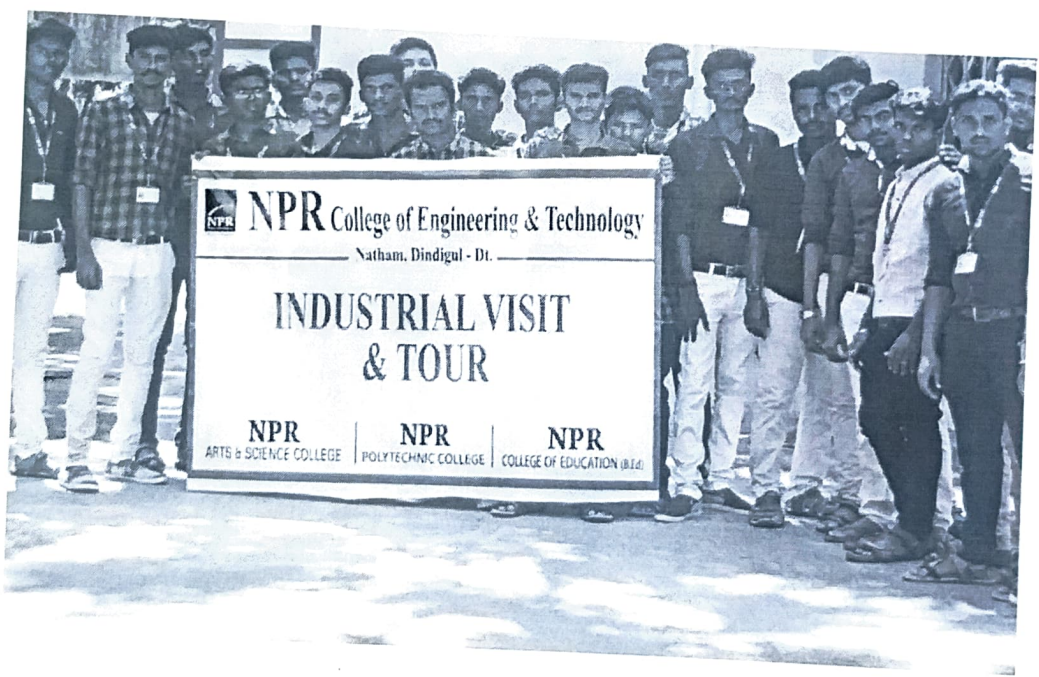|				
37.	MOHAMMED HISSAM R	ECE-A	MALE	
38.	MOKESH NANDHU P	ECE-A	MALE	
39.	MUKESH VARMA M	ECE-A	MALE	
40.	NACHAMMAI C	ECE-A	FEMALE	
41.	AAKASH R	ECE-A	MALE	
42.	ABDUL RAHMAN A	ECE-A	MALE	
43.	ABHISHEK S	ECE-A	MALE	
44.	ALAGU PANDI P	ECE-A	MALE	
45.	ASHOK KUMAR S	ECE-A	MALE	
46.	BALURATHINAM B T	ECE-A	MALE	
47.	BHUWANESHWARAN B	ECE-A	MALE	
48.	CHINRAMAN V	ECE-A	MALE	
49.	DHANANJEYAN M	ECE-A	MALE	
50.	HARISHBALAJI E	ECE-A	MALE	
51.	HEMANTH BALA M	ECE-A	MALE	
52.	IMRANA Y	ECE-A	MALE	
53.	JOSEPH SAMUEL M	ECE-A	MALE	
54.	KALEESHWARAN M	ECE-A	MALE	
55.	KARTHICK B	ECE-A	MALE	
56.	LAKSHMANADHASAN S	ECE-A	MALE	
57.	LAKSHMANAN K	ECE-A	MALE	
58.	MANIKANDAN G	ECE-A	MALE	
59.	MANIKANDAN N	ECE-A	MALE	
60.	MANOJ KUMAR S	ECE-A	MALE	
61.	MELVIN MECVAAN J	ECE-A	MALE	
62.	MOHAMED BARUK S	ECE-A	MALE	
63.	SARANYA	ECE-B	MALE	
64.	PRIYA DHARSHINI S	ECE-B	MALE	
65.	SANGILI PERUMAL M	ECE-B	MALE	
66.	SIVA BALAN S	ECE-B	MALE	
67.	SIVABALAJI M	ECE-B	MALE	
68.	SUBASH CHANDRA BOSE S	ECE-B	MALE	
69.	NEHA A	ECE-B	FEMALE	
70.	NITHISHKUMAR K	ECE-B	MALE	
71.	NITHYASRI R	ECE-B	FEMALE	
72.	PARTHA SARATHI K	ECE-B	MALE	
73.	NADHIYA M	ECE-B	FEMALE	
74.	TAMILARASI C	ECE-B	FEMALE	
75.	RAGUL M	ECE-B	MALE	
76.	RAMAPRABAKARAN R	ECE-B	MALE	
77.	RAMJI M	ECE-B	MALE	
78.	RAVIKUMAR S	ECE-B	MALE	
79.	SABARI PRASATH P	ECE-B	MALE	
80.	SAKTHI PRASANNA M	ECE-B	MALE	

HOD-I YEAR
(Dr. Priya)

PRINCIPAL
Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

NATHAM
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Industrial Visit to VEI Technologies, Chennai

PHOTO GALLERY

Students are standing in front of VEI Technologies

Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

14

Industrial Visit to VEI Technologies, Chennai

SUMMARY REPORT

The purpose of the visit was to provide the students with an opportunity to gain practical knowledge about the functioning of an industry and its various departments. The visit was attended by a I year Students from NPR CET and took place on December.18th.2021. We were picked up from NPR CET at 9:30 pm and travelled by bus to Chennai. We reached Chennai at 6:00 am and returned to NPR CET at 5:00 am the next day.

VEI Technologies, is R&D company with proficient web development and software solution company based in Chennai. They offer an extensive range of services to reach our targeted spectators and carve up our valuable information focusing on retaining their customers.

From 9:00 am to 12:00 pm, the students visited VEI Technologies and were given a guided tour of the facility. They were able to see the various departments in action and understand the working of the industry.

We met the Director of the company, Mr. Babu Ezhilavan, Poonamallee, Chennai, where the company staff explained about some of their services, Web application development, Website designing, corporate profiles and presentations, E-commerce solutions, Application development, maintenance, and re- engineering, Mail gateways, Web hosting solutions, Search Engine Optimization, and Flash development.

They interacted with students very well and gave us an insight about the value added courses they provide on IOT, Java and Python. Students are also asked some questions regarding the courses to them and cleared their doubts.

From 12:00 pm to 1:00 pm, the students had their lunch at a nearby restaurant. From 1:00 pm to 3:00 pm, the students visited the planetarium, followed by a visit to the zoo from 3:00 pm to 5:00 pm, and then a visit to the beach from 5:00 pm to 6:30 pm. The students started to return at 8:00 pm and reached NPRCET at 5:00 am the next day.

Overall, the industrial visit to VEI Technologies in Chennai was a valuable experience for the students to understand the practical aspects of an industry and its functioning. The visit was well-organized and provided a good balance between the industrial visit and leisure activities.

1. S. Visithra.
2. P. Madasamy
Faculty Co-ordinators

HOD-I Year
(Dr. T.Priya)

IQAC

Principal
Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal

1. S. Visithra, AP/Maths
2. P. Madasamy, AP/Maths.

Coordinator - IQAC
NPR College of Engineering & Technology
Natham, Dindigul (Dt)-624 NPR. College of Engineering & Technology

15

PH3256   PHYSICS FOR INFORMATION SCIENCE   L T P C
                                                    3 0 0 3

COURSE OBJECTIVES:

- To make the students understand the importance in studying electrical properties of materials.
- To enable the students to gain knowledge in semiconductor physics
- To instill knowledge on magnetic properties of materials.
- To establish a sound grasp of knowledge on different optical properties of materials, opticaldisplays and applications
- To inculcate an idea of significance of nano structures, quantum confinement, ensuing nano device applications and quantum computing.

UNIT I   ELECTRICAL PROPERTIES OF MATERIALS   9

Classical free electron theory - Expression for electrical conductivity – Thermal conductivity, expression - Wiedemann-Franz law – Success and failures - electrons in metals – Particle in a three dimensional box – degenerate states – Fermi- Dirac statistics – Density of energy states – Electron in periodic potential – Energy bands in solids – tight binding approximation - Electron effective mass – concept of hole.

UNIT II   SEMICONDUCTOR PHYSICS   9

Intrinsic Semiconductors – Energy band diagram – direct and indirect band gap semiconductors – Carrier concentration in intrinsic semiconductors – extrinsic semiconductors - Carrier concentration in N-type & P-type semiconductors – Variation of carrier concentration with temperature – variation of Fermi level with temperature and impurity concentration – Carrier transport in Semiconductor: random motion, drift, mobility and diffusion – Hall effect and devices – Ohmic contacts – Schottky diode.

UNIT III MAGNETIC PROPERTIES OF MATERIALS   9

Magnetic dipole moment – atomic magnetic moments- magnetic permeability and susceptibility - Magnetic material classification: diamagnetism – paramagnetism – ferromagnetism – antiferromagnetism – ferrimagnetism – Ferromagnetism: origin and exchange interaction- saturation magnetization and Curie temperature – Domain Theory- M versus H behaviour – Hard and soft magnetic materials – examples and uses-– Magnetic principle in computer data storage – Magnetic hard disc (GMR sensor).

UNIT IV   OPTICAL PROPERTIES OF MATERIALS   9

Classification of optical materials – carrier generation and recombination processes - Absorption emission and scattering of light in metals, insulators and semiconductors (concepts only) - photo currentin a P-N diode – solar cell - LED – Organic LED – Laser diodes – Optical data storage techniques.

Introduction - quantum confinement – quantum structures: quantum wells, wires and dots — band gapof nanomaterials. Tunneling – Single electron phenomena: Coulomb blockade - resonant-tunneling diode – single electron transistor – quantum cellular automata - Quantum system for information processing - quantum states – classical bits – quantum bits or qubits –CNOT gate - multiple qubits – Bloch sphere – quantum gates – advantage of quantum computing over classical computing.

TOTAL :45 PERIODS

COURSE OUTCOMES:

At the end of the course, the students should be able to
- gain knowledge on classical and quantum electron theories, and energy band structures
- acquire knowledge on basics of semiconductor physics and its applications in various devices
- get knowledge on magnetic properties of materials and their applications in data storage,
- have the necessary understanding on the functioning of optical materials for optoelectronics
- understand the basics of quantum structures and their applications and basics of quantum computing

TEXT BOOKS:
1. Jasprit Singh, "Semiconductor Devices: Basic Principles", Wiley (Indian Edition), 2007.
2. S.O. Kasap. Principles of Electronic Materials and Devices, McGraw-Hill Education (IndianEdition), 2020.
3. Parag K. Lala, Quantum Computing: A Beginner's Introduction, McGraw-Hill Education (IndianEdition), 2020.

REFERENCES:
1. Charles Kittel, Introduction to Solid State Physics, Wiley India Edition, 2019.
2. Y.B.Band and Y.Avishai, Quantum Mechanics with Applications to Nanotechnology and
3. Information Science, Academic Press, 2013.
4. V.V.Mitin, V.A. Kochelap and M.A.Stroscio, Introduction to Nanoelectronics, Cambridge Univ.Press,2008.
5. G.W. Hanson, Fundamentals of Nanoelectronics, Pearson Education (Indian Edition) 2009.
6. B.Rogers, J.Adams and S.Pennathur, Nanotechnology: Understanding Small Systems, CRC Press,2014.

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PERMISSION LETTER

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NPR College of Engineering & Technology,

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Dindigul – 624 401.

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Through Proper Channel

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B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

Yours faithfully,

(Dr.T.Priya)

2

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ISO 9001

REQUISITION LETTER

Gmail

Inbox

NPR S&H<hodmathematicsnprcet@gmail.com>

To: info@veitecnologies.com

Mon, DEC 13, 2021,
10.16 AM

Respected Sir,

Greetings...!

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Thanks, and regards

Dr. T. Priya,

Professor & Head

Department of Science and Humanities,

NPRCET,

Natham.

Reply Forward

3

NPR College of Engineering & Technology

NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.
An ISO 9001:2015 Certified Institution.
Phone No: 04544- 246 500, 246501, 246502.
Website : www.nprcolleges.org, www.nprcet.org, Email:nprcetprincipal@nprcolleges.org

ISO 9001

CONFIRMATION LETTER FROM INDUSTRY

NPR S&H<hodmathematicsnprcet@gmail.com>

To: info@veitecnologies.com

Mon, DEC 13, 2021,
10.16 AM

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Dr B Ezhilavan,

Managing Director,

VEI Technologies, Chennai.

Dr. J.SUNDARARAJAN,
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Industrial Visit to VEI Technologies, Chennai
DEPARTMENT OF SCIENCE AND HUMANITIES
STUDENTS LIST

PLACE OF INDUSTRIAL VISIT: VEI Technologies, Chennai

DATE: 18.12.2021

S. NO	NAME OF THE STUDENT	DEPARTMENT	GENDER	SIGNATURE
1.	JEEVADHARANI P	EEE	FEMALE	
2.	LOGESH KUMAR B	EEE	MALE	
3.	LOGESHWARAN S	EEE	MALE	
4.	MOHAMED THOUFEEK	EEE	MALE	
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HOD-I YEAR
(Dr. Priya)

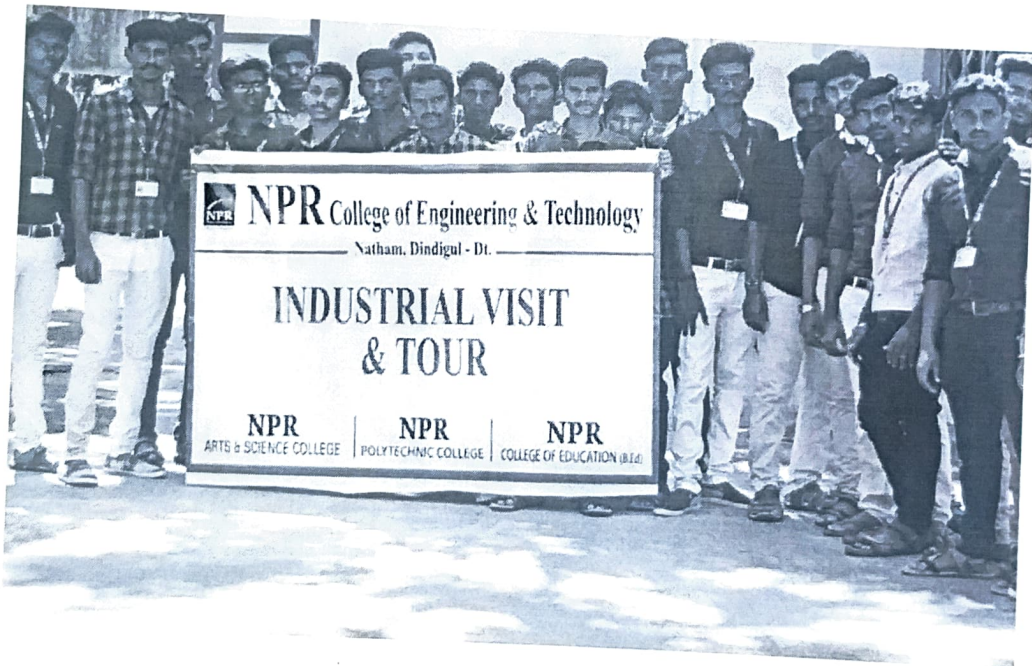**PRINCIPAL**
Dr. J.SUNDARARAJAN,
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NATHAM

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Industrial Visit to VEI Technologies, Chennai

PHOTO GALLERY

Students are standing in front of VEI Technologies

Dr. J.SUNDARARAJAN,
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Industrial Visit to VEI Technologies, Chennai

SUMMARY REPORT

The purpose of the visit was to provide the students with an opportunity to gain practical knowledge about the functioning of an industry and its various departments. The visit was attended by a I year Students from NPR CET and took place on December.18th.2021. We were picked up from NPR CET at9:30 pm and travelled by bus to Chennai. We reached Chennai at 6:00 am and returned to NPR CET at 5:00 am the next day.

VEI Technologies, is R&D company with proficient web development and software solution company based in Chennai. They offer an extensive range of services to reach our targeted spectators and carve up our valuable information focusing on retaining their customers.

From 9:00 am to 12:00 pm, the students visited VEI Technologies and were given a guided tour of the facility. They were able to see the various departments in action and understand the working of the industry.

We met the Director of the company, Mr. Babu Ezhilavan, Poonamallee, Chennai, where the company staff explained about some of their services, Web application development, Website designing, corporate profiles and presentations, E-commerce solutions, Application development, maintenance, and re- engineering, Mail gateways, Web hosting solutions, Search Engine Optimization, and Flash development.

They interacted with students very well and gave us an insight about the value added courses they provide on IOT, Java and Python. Students are also asked some questions regarding the courses to them and cleared their doubts.

From 12:00 pm to 1:00 pm, the students had their lunch at a nearby restaurant. From 1:00 pm to 3:00 pm, the students visited the planetarium, followed by a visit to the zoo from 3:00 pm to 5:00 pm, and then a visit to the beach from 5:00 pm to 6:30 pm. The students started to return at 8:00 pm and reached NPRCET at 5:00 am the next day.

Overall, the industrial visit to VEI Technologies in Chennai was a valuable experience for the students to understand the practical aspects of an industry and its functioning. The visit was well-organized and provided a good balance between the industrial visit and leisure activities.

1. S. Visithia.
2. P. Madasamy
Faculty Co-ordinators
1. S. Visithia, AP/Maths
2. P. Madasamy, AP/Maths

HOD-I Year
(Dr. J.Priya)

IQAC
Coordinator - IQAC
NPR College of Engineering & Technology,
Natham, Dindigul (Dt)-624 401.

Principal
Dr. J.SUNDARARAJAN,
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Principal
NPR. College of Engineering & Technology

15

BE3251 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING L T P C
                                                         3 0 0 3

COURSE OBJECTIVES:

- To introduce the basics of electric circuits and analysis
- To impart knowledge in the basics of working principles and application of electricalmachines
- To introduce analog devices and their characteristics
- To educate on the fundamental concepts of digital electronics
- To introduce the functional elements and working of measuring instruments

UNIT I   ELECTRICAL CIRCUITS   9

DC Circuits: Circuit Components: Conductor, Resistor, Inductor, Capacitor – Ohm's Law - Kirchhoff's Laws –Independent and Dependent Sources – Simple problems- Nodal Analysis, Mesh analysis with independent sources only (Steady state)

Introduction to AC Circuits and Parameters: Waveforms, Average value, RMS Value, Instantaneous power, real power, reactive power and apparent power, power factor – Steady state analysis of RLC circuits (Simple problems only)

UNIT II   ELECTRICAL MACHINES   9

Construction and Working principle- DC Separately and Self excited Generators, EMF equation, Types and Applications. Working Principle of DC motors, Torque Equation, Types and Applications. Construction, Working principle and Applications of Transformer, Three phase Alternator, Synchronousmotor and Three Phase Induction Motor.

UNIT III   ANALOG ELECTRONICS   9

Resistor, Inductor and Capacitor in Electronic Circuits- Semiconductor Materials: Silicon &Germanium – PN Junction Diodes, Zener Diode –Characteristics Applications – Bipolar Junction Transistor-Biasing,JFET, SCR, MOSFET,IGBT – Types, I-V Characteristics and Applications, Rectifier and Inverters

UNIT IV   DIGITAL ELECTRONICS   9

Review of number systems, binary codes, error detection and correction codes, Combinational logic - representation of logic functions-SOP and POS forms, K-map representations - minimization using K maps (Simple Problems only).

UNIT V   MEASUREMENTS AND INSTRUMENTATION   9

Functional elements of an instrument, Standards and calibration, Operating Principle, types - Moving Coil and Moving Iron meters, Measurement of three phase power, Energy Meter, Instrument Transformers-CT and PT, DSO- Block diagram- Data acquisition.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After completing this course, the students will be able to

CO1: Compute the electric circuit parameters for simple problems

CO2: Explain the working principle and applications of electrical machines

CO3: Analyze the characteristics of analog electronic devices

CO4: Explain the basic concepts of digital electronics

CO5: Explain the operating principles of measuring instruments

TEXT BOOKS:

1. Kothari DP and I.J Nagrath, "Basic Electrical and Electronics Engineering", Second Edition,McGraw Hill Education, 2020

2. S.K.Bhattacharya "Basic Electrical and Electronics Engineering", Pearson Education, SecondEdition, 2017.

3. Sedha R.S., "A textbook book of Applied Electronics", S. Chand & Co., 2008

4. James A .Svoboda, Richard C. Dorf, "Dorf's Introduction to Electric Circuits", Wiley, 2018.

5. A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements &Instrumentation', Dhanpat Rai and Co, 2015.

REFERENCES:

1. Kothari DP and I.J Nagrath, "Basic Electrical Engineering", Fourth Edition, McGraw Hill Education, 2019.

2. Thomas L. Floyd, 'Digital Fundamentals', 11th Edition, Pearson Education, 2017.

3. Albert Malvino, David Bates, 'Electronic Principles, McGraw Hill Education; 7th edition, 2017.

4. Mahmood Nahvi and Joseph A. Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill,2002.

5. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw-Hill, New Delhi, 2010

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ISO 9001

PERMISSION LETTER

From

Dr. T. Priya,

Head of the Department,

Department of Science and Humanities,

NPR College of Engineering & Technology,

Natham,

Dindigul – 624 401.

To

The Administrative Office,

NPR Group of Institutions,

Natham,

Dindigul – 624 401.

Through Proper Channel

Sir,

Sub: Requesting permission for Industrial visit – Reg.

This is to bring to your kind notice that we are planning to organize one day visit to **VEI Technologies** for the 1st Year students.

So, I request you to grant permission for 80 students from I Year (60 Boys & 20 Girls)and 2 staff members (Mr. P. Madasamy, AP/ Maths and Mrs.S.Visithra, AP/ Maths) on 18.12.2021to visit **VEI Technologies, Chennai.**

Kindly do the needful.

Thanking you,

Yours faithfully,

Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

(Dr.T.Priya)

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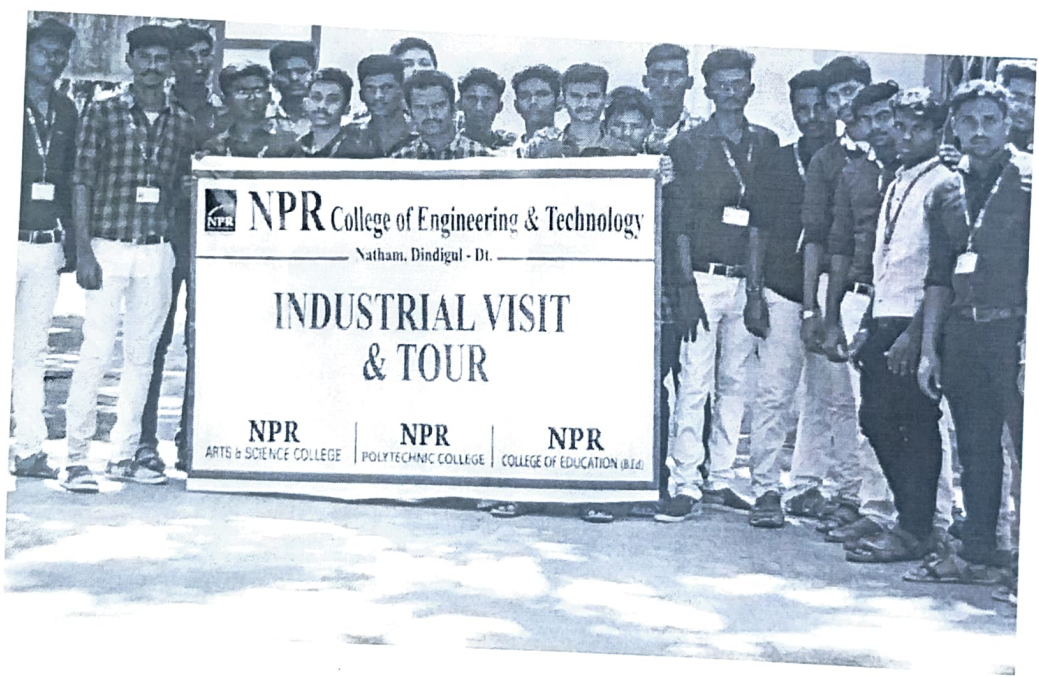|				
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HOD-I YEAR

(Dr. Piya)

PRINCIPAL

Dr. J.SUNDARARAJAN,

B.E., M.Tech., Ph.D.,

Principal

N.P.R. College of Engineering & Technology

Natham, Dindigul (Dt) - 624 401.

NATHAM

NPR College of Engineering & Technology

NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.
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Website : www.nprcolleges.org, www.nprcet.org, Email:nprcetprincipal@nprcolleges.org

ISO 9001

Industrial Visit to VEI Technologies, Chennai

PHOTO GALLERY

Students are standing in front of VEI Technologies

Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
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Natham, Dindigul (Dt) - 624 401.

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SUMMARY REPORT

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VEI Technologies, is R&D company with proficient web development and software solution company based in Chennai. They offer an extensive range of services to reach our targeted spectators and carve up our valuable information focusing on retaining their customers.

From 9:00 am to 12:00 pm, the students visited VEI Technologies and were given a guided tour of the facility. They were able to see the various departments in action and understand the working of the industry.

We met the Director of the company, Mr. Babu Ezhilavan, Poonamallee, Chennai, where the company staff explained about some of their services, Web application development, Website designing, corporate profiles and presentations, E-commerce solutions, Application development, maintenance, and re- engineering, Mail gateways, Web hosting solutions, Search Engine Optimization, and Flash development.

They interacted with students very well and gave us an insight about the value added courses they provide on IOT, Java and Python. Students are also asked some questions regarding the courses to them and cleared their doubts.

From 12:00 pm to 1:00 pm, the students had their lunch at a nearby restaurant. From 1:00 pm to 3:00 pm, the students visited the planetarium, followed by a visit to the zoo from 3:00 pm to 5:00 pm, and then a visit to the beach from 5:00 pm to 6:30 pm. The students started to return at 8:00 pm and reached NPRCET at 5:00 am the next day.

Overall, the industrial visit to VEI Technologies in Chennai was a valuable experience for the students to understand the practical aspects of an industry and its functioning. The visit was well-organized and provided a good balance between the industrial visit and leisure activities.

1. S. Visithra.
2. P. Madasamy
Faculty Co-ordinators

HOD-I Year
(Dr. T.Pima)

IQAC

Coordinator - IQAC
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Natham, Dindigul (Dt)-624401

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NPR College of Engineering & Technology

1. S. Visithra, AP/Maths
2. P. Madasamy, AP/Maths

15

CS3251	PROGRAMMING IN C	L T P C
		3 0 0 3

COURSE OBJECTIVES:

- To understand the constructs of C Language.
- To develop C Programs using basic programming constructs
- To develop C programs using arrays and strings
- To develop modular applications in C using functions
- To develop applications in C using pointers and structures
- To do input/output and file handling in C

UNIT I   BASICS OF C PROGRAMMING   9

Introduction to programming paradigms – Applications of C Language - Structure of C program - C programming: Data Types - Constants – Enumeration Constants - Keywords – Operators: Precedenceand Associativity - Expressions - Input/Output statements, Assignment statements – Decision making statements - Switch statement - Looping statements – Preprocessor directives - Compilation process

UNIT II   ARRAYS AND STRINGS   9

Introduction to Arrays: Declaration, Initialization – One dimensional array –Two dimensional arrays - String operations: length, compare, concatenate, copy – Selection sort, linear and binary search.

UNIT III   FUNCTIONS AND POINTERS   9

Modular programming - Function prototype, function definition, function call, Built-in functions (string functions, math functions) – Recursion, Binary Search using recursive functions –Pointers – Pointer operators – Pointer arithmetic – Arrays and pointers – Array of pointers – Parameter passing: Pass byvalue, Pass by reference.

UNIT IV   STRUCTURES AND UNION   9

Structure - Nested structures – Pointer and Structures – Array of structures – Self-referential structures -Dynamic memory allocation - Singly linked list – typedef – Union - Storage classes and Visibility.

UNIT V   FILE PROCESSING   9

Files – Types of file processing: Sequential access, Random access – Sequential access file - Randomaccess file - Command line arguments.

TOTAL : **45 PERIODS**

COURSE OUTCOMES:

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

   CO1: Demonstrate knowledge on C Programming constructs

   CO2: Develop simple applications in C using basic constructs

   CO3: Design and implement applications using arrays and strings

   CO4: Develop and implement modular applications in C using functions.

   CO5: Develop applications in C using structures and pointers.

   CO6: Design applications using sequential and random-access file processing.

TEXT BOOKS:

1. ReemaThareja, "Programming in C", Oxford University Press, Second Edition, 2016.

2. Kernighan, B.W and Ritchie,D.M, "The C Programming language", Second

   Edition, PearsonEducation, 2015.

REFERENCES:

1. Paul Deitel and Harvey Deitel, "C How to Program with an Introduction to C++", Eighth edition,Pearson Education, 2018.

2. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.

3. Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw-Hill Education, 1996.

4. Pradip Dey, Manas Ghosh, "Computer Fundamentals and Programming in C", Second

5. Edition, Oxford University Press, 2013. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", 1st Edition,Pearson Education, 2013.

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PERMISSION LETTER

From

Dr. T. Priya,

Head of the Department,

Department of Science and Humanities,

NPR College of Engineering & Technology,

Natham,

Dindigul – 624 401.

To

The Administrative Office,

NPR Group of Institutions,

Natham,

Dindigul – 624 401.

Through Proper Channel

Sir,

Sub: Requesting permission for Industrial visit – Reg.

This is to bring to your kind notice that we are planning to organize one day visit to **VEI Technologies** for the 1st Year students.

So, I request you to grant permission for 80 students from I Year (60 Boys & 20 Girls)and 2 staff members (Mr. P. Madasamy, AP/ Maths and Mrs.S.Visithra, AP/ Maths) on 18.12.2021to visit **VEI Technologies, Chennai.**

Kindly do the needful.

Thanking you,

Yours faithfully,

Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

(Dr.T.Priya)

2

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ISO 9001

REQUISITION LETTER

Gmail

Inbox

NPR S&H<hodmathematicsnprcet@gmail.com>

To: info@veitecnologies.com

Mon, DEC 13, 2021,
10.16 AM

Respected Sir,

Greetings...!

Our NPR College of engineering and technology is situated in Natham, Dindigul district in a lush green environment established with the objective of ensuring the personal and professional development of the students from rural backgrounds offering UG and PG courses.

It has been a regular practice in our Science and Humanities Department to arrange industrial visits for our students every semester to reputed engineering industries. Based on that, 40 I YEAR students and 2 staff members of our Science and Humanities department have planned to visit VEI **Technologies**. We assure you sir, our students will follow the safety rules and will not disturb your regular processes. We humbly request you to grant us permission for the same and to confirm the permission through letter or mail.

Thanks, and regards

Dr. T. Priya,

Professor & Head

Department of Science and Humanities,

NPRCET,

Natham.

Reply Forward

3

NPR College of Engineering & Technology

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CONFIRMATION LETTER FROM INDUSTRY

NPR S&H<hodmathematicsnprcet@gmail.com>

To: info@veitecnologies.com

Mon, DEC 13, 2021,
10.16 AM

Respected Sir,

Greetings...!

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Thanks, and regards

Dr. T. Priya,

Prof & HOD,

Department of Science and Humanities,

NPRCET,

Natham.

Reply Forward

Gmail

Inbox

info@veitechnologies.com

Wed, Dec 15,2021, 12.28 PM

To: hodmathematicsnprcet@gmail.com

Dear Madam,

We are happy to give permission for the industrial visit to your wards in VEI Technologies, Chennai. Kindly remind us one day in advance for the visit schedule also send the original letter copy with your hand during the visit.
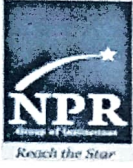
Thanks and Regards,

Dr B Ezhilavan,

Managing Director,

VEI Technologies, Chennai.

Dr. J.SUNDARARAJAN,
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Industrial Visit to VEI Technologies, Chennai
DEPARTMENT OF SCIENCE AND HUMANITIES
STUDENTS LIST

PLACE OF INDUSTRIAL VISIT: VEI Technologies, Chennai   DATE: 18.12.2021

S. NO	NAME OF THE STUDENT	DEPARTMENT	GENDER	SIGNATURE
1.	JEEVADHARANI P	EEE	FEMALE	
2.	LOGESH KUMAR B	EEE	MALE	
3.	LOGESHWARAN S	EEE	MALE	
4.	MOHAMED THOUFEEK	EEE	MALE	
5.	RAMYA M	EEE	FEMALE	
6.	SANTHOSH A	EEE	MALE	
7.	SANTHOSH KUMAR R	EEE	MALE	
8.	JEYAVARTYIHINI	EEE	FEMALE	
9.	KEERTHIKA P	EEE	FEMALE	
10.	LAARADOLLY S	EEE	FEMALE	
11.	KIRTHIKANANTH M	CSE	MALE	
12.	MOHAMMED ABDULA S	CSE	MALE	
13.	MUTHUARIVU K	CSE	MALE	
14.	PRAVEEN C	CSE	MALE	
15.	RAGHUL S P	CSE	MALE	
16.	AARIF H	CSE	MALE	
17.	AJAY KUMAR K	CSE	MALE	
18.	ANBARASAN P	CSE	MALE	
19.	ANBARASU S	CSE	MALE	
20.	ANBULINGAM E	CSE	MALE	
21.	APSARA JASMINE S	CSE	FEMALE	
22.	ARASUTHANGAPANDI M	CSE	MALE	
23.	ARUSHA BANU A	CSE	FEMALE	
24.	BABY SHALINI C	CSE	FEMALE	
25.	DHARANI T	CSE	FEMALE	
26.	SUSMITHA N	CSE	FEMALE	
27.	THESHAN BANU S	CSE	FEMALE	
28.	DHARANI R	ECE-A	FEMALE	
29.	DHARSHINI B	ECE-A	FEMALE	
30.	DIVYA DHARSINI G	ECE-A	FEMALE	
31.	DURGA S	ECE-A	FEMALE	
32.	GANESAN M	ECE-A	MALE	
33.	GOPINATH S	ECE-A	MALE	
34.	HARESHKUMAR K	ECE-A	MALE	
35.	HARIHARAN R	ECE-A	MALE	
36.	MOHAMED IMTHIYAS K	ECE-A	MALE	

7

37.	MOHAMMED HISSAM R	ECE-A	MALE	
38.	MOKESH NANDHU P	ECE-A	MALE	
39.	MUKESH VARMA M	ECE-A	MALE	
40.	NACHAMMAI C	ECE-A	FEMALE	
41.	AAKASH R	ECE-A	MALE	
42.	ABDUL RAHMAN A	ECE-A	MALE	
43.	ABHISHEK S	ECE-A	MALE	
44.	ALAGU PANDI P	ECE-A	MALE	
45.	ASHOK KUMAR S	ECE-A	MALE	
46.	BALURATHINAM B T	ECE-A	MALE	
47.	BHUWANESHWARAN B	ECE-A	MALE	
48.	CHINRAMAN V	ECE-A	MALE	
49.	DHANANJEYAN M	ECE-A	MALE	
50.	HARISHBALAJI E	ECE-A	MALE	
51.	HEMANTH BALA M	ECE-A	MALE	
52.	IMRANA Y	ECE-A	MALE	
53.	JOSEPH SAMUEL M	ECE-A	MALE	
54.	KALEESHWARAN M	ECE-A	MALE	
55.	KARTHICK B	ECE-A	MALE	
56.	LAKSHMANADHASAN S	ECE-A	MALE	
57.	LAKSHMANAN K	ECE-A	MALE	
58.	MANIKANDAN G	ECE-A	MALE	
59.	MANIKANDAN N	ECE-A	MALE	
60.	MANOJ KUMAR S	ECE-A	MALE	
61.	MELVIN MECVAAN J	ECE-A	MALE	
62.	MOHAMED BARUK S	ECE-A	MALE	
63.	SARANYA	ECE-B	MALE	
64.	PRIYA DHARSHINI S	ECE-B	MALE	
65.	SANGILI PERUMAL M	ECE-B	MALE	
66.	SIVA BALAN S	ECE-B	MALE	
67.	SIVABALAJI M	ECE-B	MALE	
68.	SUBASH CHANDRA BOSE S	ECE-B	MALE	
69.	NEHA A	ECE-B	FEMALE	
70.	NITHISHKUMAR K	ECE-B	MALE	
71.	NITHYASRI R	ECE-B	FEMALE	
72.	PARTHA SARATHI K	ECE-B	MALE	
73.	NADHIYA M	ECE-B	FEMALE	
74.	TAMILARASI C	ECE-B	FEMALE	
75.	RAGUL M	ECE-B	MALE	
76.	RAMAPRABAKARAN R	ECE-B	MALE	
77.	RAMJI M	ECE-B	MALE	
78.	RAVIKUMAR S	ECE-B	MALE	
79.	SABARI PRASATH P	ECE-B	MALE	
80.	SAKTHI PRASANNA M	ECE-B	MALE	

HOD-I YEAR
(Dr. Pila)

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PHOTO GALLERY

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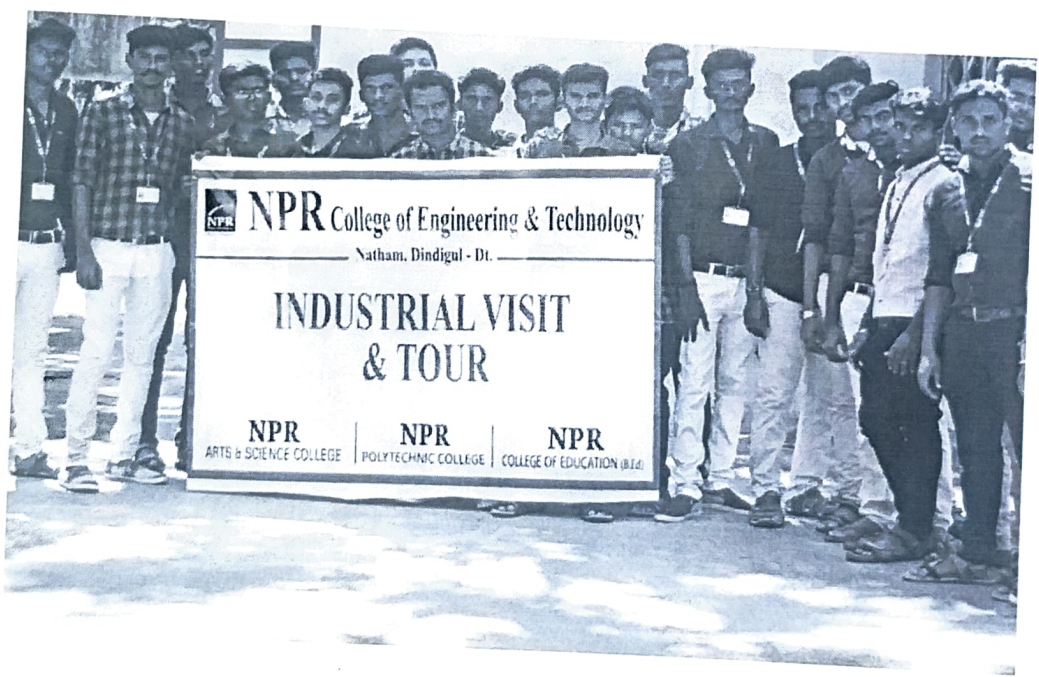
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(Dr. J.Priya)

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Principal
Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
NPR. College of Engineering & Technology

15

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 Flow
Tables – 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 the
Verilog 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, Pearson
Education, 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.

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Natham, Dindigul (Dt) - 624 401.

Date: 26.08.2021

CERTIFICATE OF INTERNSHIP TRAINING

This is to certify that Mr. Anandakumar A from NPR College Engineering and Technology has successfully completed internship training from 04.08.2021 to 18.08.2021 in our organization.

During the tenure of training, we found him very sincere, attentive and good behaviour.

Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

For C3 TECHNOLOGIES

Managing Director

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 to postfix 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 of heap.

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, Pearson Education,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 to Algorithms", 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

Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

4th Oct' 2021

To Whom So Ever It May Concern
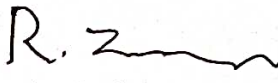
This is to certify that **Ms. Sathana.S,** Department of Computer Science & Engineering, NPR College of Engineering & Technology, Natham, Dindigul has undergone implant training from **20.09.2021 to 27.09.2021** in our organization.

During the period of her training, she had shown keen interest towards learning.

She demonstrated good design skills with self-motivated attitude to learn new things.

We wish her future endeavor.

Yours Sincerely,
For **CMS IT Services Pvt Ltd.,**

Authorized Signatory,

Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.PR. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

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CS8392   **OBJECT ORIENTED PROGRAMMING**   **L T P C**
                                                                                 3 0 0 3

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.

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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.

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INFO@XPLOREITCORP.COM
WWW.XPLOREITCORP.COM

Date: 30.08.2021

CERTIFICATE OF COMPLETION

This is to certify that Ms. Divya S student of BE-CSE third year, NPR college of Engineering & Technology, Natham, Dindigul, has successfully completed internship training from 12.08.2021 to 26.08.2021.
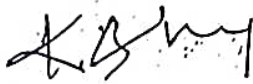
During this period her performance was found good.

We wish her good luck for all the future endeavours and looks forward to work in future.

For Xplore IT Corp

Authorized Signatory

Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
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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

UNITII 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.

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8th , Nov 2021

To Whom So Ever It May Concern

This is to certify that **Mr. Thirunavakarasar. T** Department of Computer Science & Engineering, NPR College of Engineering & Technology, Natham, Dindigul has undergone internship training from **11.10.21 to 25.10.2021** in our organization.

During the period of her training, she had shown keen interest towards learning.

She demonstrated good design skills with self-motivated attitude to learn new things.

We wish her future endeavor.

Yours Sincerely,
For **CMS IT Services Pvt Ltd.,**

Authorized Signatory,

Dr. J.SUNDARARAJAN,
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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 point arithmetic 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 of the 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: The Hardware/Software Interface, Fifth Edition, Morgan Kaufmann / Elsevier, 2014.
2. Carl Hamacher, Zvonko Vranesic, Safwat Zaky and Naraig Manjikian, Computer Organization and Embedded Systems, Sixth Edition, Tata McGraw Hill, 2012.

REFERENCES:
1. William Stallings, Computer Organization and Architecture – Designing for Performance, Eighth Edition, Pearson Education, 2010.
2. John P. Hayes, Computer Architecture and Organization, Third Edition, Tata
52
McGraw Hill, 2012.
3. John L. Hennessey and David A. Patterson, Computer Architecture – A Quantitative

Approach‖, Morgan Kaufmann / Elsevier Publishers, Fifth Edition, 2012.

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Date: 20.08.2021

CERTIFICATE OF COMPLETION
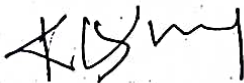
This is to certify that Ms. Kamali B student of BE-CSE final year, NPR college of Engineering & Technology, Natham, Dindigul, has successfully completed inplant training from 09.08.2021 to 16.08.2021.

During this period her performance was found good.

We wish her good luck for all the future endeavours and looks forward to work in future.

For Xplore IT Corp

Authorized Signatory

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CS8492   **DATABASE MANAGEMENT SYSTEMS**   **L T P C**
                                                                   3 0 0 3

OBJECTIVES

· To learn the fundamentals of data models and to represent a database system using ER diagrams.

· To study SQL and relational database design.

· To understand the internal storage structures using different file and indexing techniques which will help in physical DB design.

· To understand the fundamental concepts of transaction processing- concurrency control techniques and recovery procedures.

· To have an introductory knowledge about the Storage and Query processing Techniques

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 Fourth Normal 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 – Query Processing Overview – Algorithms for SELECT and JOIN operations – Query optimization using Heuristics 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", Sixth

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Edition, 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-Hill College Publications, 2015.
3. G.K.Gupta,"Database Management Systems", Tata McGraw Hill, 2011.

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PRIVACY BASED IMAGE SHARING IN SOCIAL NETWORKS USING WAVELET TRANSFORM

A PROJECT REPORT

Submitted by

NIVEDHA.R   (920818104020)

RAMYA.R   (920818104026)

SARANIYA.M   (920818104033)

VIJAYA BHARATHI.P   (920818104038)

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

NPR COLLEGE OF ENGINEERING AND TECHNOLOGY,

NATHAM, DINDIGUL.

ANNA UNIVERSITY :: CHENNAI 600 025

JUNE 2022

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Dr. J.SUNDARARAJAN,
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ABSTRACT

Image over the social network is transferred or transmitted between servers and mobile users. Privacy of that data is very important as it belongs to personal sensitive information. If image gets hacked by the hacker, can be used to defame a person's social data. In existing system, text-based encryption can be implemented in mobile cloud computing. There are many different approached of storing data securely over the cloud, using mobile computing such as end-to-end encrypted data transmission, dynamic credential generation only for text data. In this project, we can introduce a novel watermarking scheme with wavelet algorithm named as discrete wavelet transform in real time social network application as Facebook. In this scheme we can use images and stored in server in secure format. And also extend the project; we categorize the picture as sensitive or normal. If it is sensitive means, perform copyrights algorithms. Then provide the permission to the receiver end for download the images in secure manner. Experimental result can be shows that in real time mobile cloud environments using C#.NET as front end and SQL SERVER as back end and comparative study of existing algorithms based on computational time and privacy rate.

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Natham, Dindigul (Dt) - 624 401.

III

CHAPTER 12

CONCLUSION AND FUTURE ENHANCEMENT

11.1 CONCLUSION

The appearance of well-known online social networking has triggered within the compromise of conventional notions of privateness, certainly in visual media. With a view to facilitate useful and principled protection of picture privateness online, we have got supplied the design, implementation, and evaluation of photo shield gadget that successfully and successfully protects client's photo privateness across famous OSNs. The digital watermarking approach based fully on DWT coefficients modification for social networking offerings has been presented on this paper. In the embedding manner, the coefficients in LL sub-band had been used to embed watermark. Within the extraction process, normal coefficient prediction based on imply clear out is used to boom the accuracy of the extracted watermark.

11.2 FUTURE ENHANCEMENT

As part of future work, to implement cryptographic techniques and various filtering techniques to secure OSN home page. And also extend the work in privacy based uploaded video content sharing sites. The experimental outcome confirmed a larger overall efficiency in specific time application.

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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 and Non-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++, Second
Edition, Universities Press, 2007.

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REFERENCES:

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to 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/

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Nathami, Dindigul (Dt) - 624 401.

Date: 27.09.21

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. Janani R**, third year student of BE-Computer science and Engineering, **NPR college of Engineering & Technology, Natham, Dindigul**, has successfully Implant training in our organization from **06.09.2021 to 13.09.2021**.

During the above period we found him sincere and hardworking. She has taken proper initiative efforts towards completed his training.

We wish her all the best for the future career.

Managing Director
Mr.S.Kumaraguru

Dr. J.SUNDARARAJ
B.E., M.Tech., Ph...
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

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 OS Layer, File System.

                                                                           TOTAL : 45 PERIODS

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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, Pearson Education, 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.

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Triflorum Engineering and Business Solutions
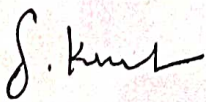
TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Naveen Kumar S** , third year student of BE-Computer science and Engineering, NPR college of Engineering & Technology, Natham, Dindigul, has successfully completed implant training in our organization from 06.09.2021 to 13.09.2021.

During the above period we found him sincere and hardworking. He has taken proper initiative efforts towards completed his training.

We wish him all the best for the future career.

Managing Director
Mr.S.Kumaraguru

Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
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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 based components, traditional Components.

UNIT IV TESTING AND MAINTENANCE   **9**

Software testing fundamentals-Internal and external views of Testing-white box testing - basis path 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.

UNIT V PROJECT MANAGEMENT   **9**

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, Mc Graw-Hill International Edition, 2010.
2. Ian Sommerville, "Software Engineering", 9th Edition, Pearson Education Asia, 2011.

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REFERENCES:
1. Rajib Mall, "Fundamentals of Software Engineering", Third Edition, PHI Learning PrivateLimited, 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 Company Limited,2007.
5. http://nptel.ac.in/.

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Date: 26.08.2021

CERTIFICATE OF IN-PLANT TRAINING

This is to certify that Ms. Indhumathi V. from NPR College Engineering and Technology has successfully completed internship training from 04.08.2021 to 18.08.2021 in our organization.

During the tenure of training, we found him very sincere, attentive and good behaviour.

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For C3 TECHNOLOGIES

Managing Director

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, Fifth
Edition, Morgan Kaufmann Publishers Inc., 2012.
2. William Stallings, Data and Computer Communications, Tenth Edition, Pearson
Education, 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 Open
Source Approach, McGraw Hill Publisher, 2011.
5. James F. Kurose, Keith W. Ross, Computer Networking, A Top-Down Approach
Featuring the Internet, Sixth Edition, Pearson Education, 2013.

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Date: 26.08.2021

CERTIFICATE OF IN-PLANT TRAINING

This is to certify that Mr. Santhosh Prakash M from NPR College Engineering and Technology has successfully completed internship training from 04.08.2021 to 18.08.2021 in our organization.

During the tenure of training, we found him very sincere, attentive and good behaviour.

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For C3 TECHNOLOGIES

Managing Director

OBJECTIVES:

· To understand the language hierarchy

· To construct automata for any given pattern and find its equivalent regular expressions

· 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
Epsilon Transitions

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
and Computations", 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.

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Date: 16.08.2021

CERTIFICATE OF IN-PLANT TRAINING

This is to certify that **Ms. Ramya R** from NPR College Engineering and Technology has successfully completed inplant training from **02.08.2021 to 09.08.2021** in our organization.

During the tenure of training, we found him very sincere, attentive and good behaviour.

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For C3 TECHNOLOGIES

Managing Director

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 and Design and Iterative Development", Third Edition, Pearson Education, 2005.
2. Ali Bahrami - Object Oriented Systems Development - McGraw Hill International Edition - 1999

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REFERENCES:

1. Erich Gamma, a n d Richard Helm, Ralph Johnson, John Vlissides, "Design patterns: Elements of 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.

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WWW.XPLOREITCORP.COM

Date: 20.08.2021

CERTIFICATE OF COMPLETION

This is to certify that Ms.Shahitha Rizwana S student of BE-CSE final year, NPR college of Engineering & Technology, Natham, Dindigul, has successfully completed inplant training from 09.08.2021 to 16.08.2021.

During this period his performance was found good.

We wish him good luck for all the future endeavours and looks forward to work in future.

For Xplore IT Corp

Authorized Signatory

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OIM551   **WORLD CLASS MANUFACTURING**   **L T P C**
                    3 0 0 3

OBJECTIVES

- Understanding of the concept and importance of strategy planning for manufacturing industries
- To apply principles and techniques in the identifiable formulation and implementation of manufacturing strategy for competitive in global context.

UNIT I INDUSTRIAL DECLINE AND ASCENDANCY   **9**
Manufacturing excellence - US Manufacturers - French Manufacturers - Japan decade – American decade - Global decade

UNIT II BUILDING STRENGTH THROUGH CUSTOMER – FOCUSED PRINCIPLES 9
Customer - Focused principles - General principles - Design - Operations - Human resources - Quality and Process improvement - Promotion and Marketing

UNIT III VALUE AND VALUATION   **9**
Product Costing - Motivation to improve - Value of the enterprises QUALITY - The Organization : Bulwark of stability and effectiveness - Employee stability – Quality Individuals Vs. Teams - Team stability and cohesiveness - Project cohesiveness and stability

UNIT IV STRATEGIC LINKAGES   **9**
Product decisions and customer service - Multi-company planning - Internal manufacturing planning - Soothing the demand turbulence

UNIT V IMPEDIMENTS   **9**
Bad plant design - Mismanagement of capacity - Production Lines - Assembly Lines – Whole Plant Associates - Facilitators - Teamsmanship - Motivation and reward in the age of continuous Improvement

               TOTAL : 45 PERIODS

OUTCOMES:
- Able to understand the concept and the importance of manufacturing strategy for industrial enterprise competitiveness.
- Apply appropriate techniques in the analysis an devaluation of company's opportunities for enhancing competitiveness in the local regional and global context.
- Identify formulation and implement strategies for manufacturing and therefore enterprise competitiveness.

TEXT BOOKS:
1. By Richard B. Chase, Nicholas J. Aquilano, F. Robert Jacobs – "Operations Management for Competitive Advantage", McGraw-Hill Irwin, ISBN 0072323159
2. Moore Ran, "Making Common Sense Common Practice: Models for Manufacturing Excellence", Elsevior Multiworth
3. Narayanan V. K., "Managing Technology & Innovation for Competitive Advantage", Pearson Education Inc.
4. Korgaonkar M. G., "Just In Time Manufacturing", MacMillan Publishers India Ltd., 5. Sahay B. S., Saxena K. B. C., Ashish Kumar, "World Class Manufacturing", MacMillan Publishers

Date: 26.08.2021

CERTIFICATE OF IN-PLANT TRAINING

This is to certify that **Ms. Sivapriya R** from NPR College Engineering and Technology has successfully completed internship training from **04.08.2021** to **18.08.2021** in our organization.

During the tenure of training, we found him very sincere, attentive and good behaviour.

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For C3 TECHNOLOGIES

Managing Director

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 – Web
Clients – 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, XML
Parsers and Validation, XSL and XSLT Transformation, News Feed (RSS and ATOM).

UNIT V INTRODUCTION TO AJAX and WEB SERVICES   **9**
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 applying
   different 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, 2nd
Edition,1999.
2. Chris Bates, Web Programming – Building Intranet Applications, 3rd Edition, Wiley
Publications, 2009.

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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.

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04ᵗʰ Oct 2021

To Whom So Ever It May Concern

This is to certify that **Mr.Vineethpandian S**, Department of Computer Science & Engineering, NPR College of Engineering & Technology, Natham, Dindigul has undergone implant training from **20.09.2021 to 27.09.2021** in our organization.

During the period of her training, she had shown keen interest towards learning.

She demonstrated good design skills with self-motivated attitude to learn new things.

We wish him future endeavor.

Yours Sincerely,
For **CMS IT Services Pvt Ltd.,**

R. 2

Authorized Signatory

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Licensee :: Entrust Technoservices Pvt. Ltd.

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, Third
Edition, 2009.
2 I. Bratko, "Prolog: Programming for Artificial Intelligence", Fourth edition, Addison-Wesley
Educational Publishers Inc., 2011.

REFERENCES:
1. M. Tim Jones, "Artificial Intelligence: A Systems Approach(Computer Science)", Jones
and 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 ISO
Standard", Fifth Edition, Springer, 2003.
4. Gerhard Weiss, "Multi Agent Systems", Second Edition, MIT Press, 2013.

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SIGN LANGUAGE RECOGNITION USING MACHINE INTELLIGENCE FOR HEARING IMPAIRMENT PERSON

A PROJECT REPORT

Submitted by

BHAVITHRA.R	(920818104003)
NIVETHA.A	(920818104021)
SAFRINE BANU.S	(920818104029)
SHAHITHA RIZWANA.S	(920818104035)

in partial fulfillment for the award of the degree

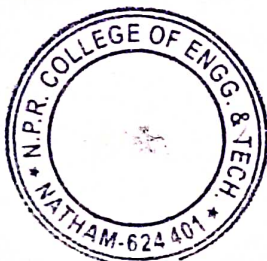*of*

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

NPR COLLEGE OF ENGINEERING AND TECHNOLOGY,

NATHAM, DINDIGUL.

ANNA UNIVERSITY :: CHENNAI 600 025

JUNE 2022

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ABSTRACT

People with impaired speech and hearing uses Sign language as form of communication. Disabled People use this sign language gestures as a tool of non-verbal communication to express their own emotions and thoughts to other common people. Conversing with people having a hearing disability is a major challenge. Deaf and Mute people use hand gesture sign language to communicate, hence normal people face problems in recognizing their language by signs made. Hence there is a need for systems that recognize the different signs and conveys the information to normal people. But these common people find it difficult to understand their expression, thus trained sign language expertise are needed during medical and legal appointment, educational and training session. Over the past few years, there has been an increase in demand for these services. Other form of services such as video remote human interpret using the high-speed Internet connection, has been introduced, thus these services provides an easy to use sign language interpret service, which can be used and benefited, yet have major limitations. To address this problem, we can implement artificial intelligence technology to analyze the user's hand with finger detection . In this proposed system we can design the vision based system in real time environments. And then using deep learning algorithm named as Convolutional neural network algorithm to classify the sign and provide the label about recognized sign.

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CHAPTER 11

11. CONCLUSION AND FUTURE ENHANCEMENT

11.1 CONCLUSION

The ability to look, listen, talk, and respond appropriately to events is one of the most valuable gifts a human being can have. However, some unfortunate people are denied this opportunity. People get to know one another through sharing their ideas, thoughts, and experiences with others around them. There are several ways to accomplish this, the best of which is the gift of "Speech." Everyone can very persuasively transfer their thoughts and comprehend each other through speech. Our initiative intends to close the gap by including a low-cost computer into the communication chain, allowing sign language to be captured, recognised, and translated into speech for the benefit of blind individuals. An image processing technique is employed in this paper to recognise the handmade movements. This application is used to present a modern integrated planned system for hear impaired people. The camera- based zone of interest can aid in the user's data collection. Each action will be significant in its own right.

11.2 FUTURE ENHANCEMENT

In future, we can extend the framework to implement various deep learning algorithms to recognize the signs and implement in real time applications.

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38

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 – Connection
Establishment – Frequency Allocation – Routing – Mobility Management – Security –
GPRSUMTS – 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 a
   given 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", PHI
Learning Pvt.Ltd, New Delhi – 2012

REFERENCES
1. Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobile
systems",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.

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FARMERS E-COMMERCE WEB APP AND MINING USER SENTIMENTAL ANALYSIS

A PROJECT REPORT

Submitted by

I. GUNA DEVI   (92081804007)

M. HEMAPRIYA   (92081804009)

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M. SHRINITHI   (92081804036)

in partial fulfilment for the award of the degree

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JUNE 2022

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ABSTRACT

Agriculture is the strength of Indian economy and 70% of India's total population is primarily dependent on agriculture for their employment. Agriculture is still an underdeveloped sector when it comes to technologies being inculcated. With the growing technology and internet services the information related to the different government agricultural schemes are now available on the internet in the form of websites and mobile apps. But because of digital illiteracy in the rural areas, farmers are not conscious about the different agricultural information & Schemes. This mobile app will provide the Indian farmers with different government schemes for which they are eligible. Consumer reviews in E- commerce systems are usually treated as the important resources that reflect users experience, feelings, and willingness to purchase items. There is no review analysis for agricultural products in our zone. All this information may involve consumer's views on things that can express interest, sentiments, and opinions. Following this view of point, an Ecommerce system reviews mining oriented sentiment similarity analysis approach is put forward to exploring users' similarity and their trust .The trust divide into two categories, namely direct trust, and propagation of trust, which represents a trust relationship between two individuals. The direct trust degree is obtained from sentiment similarity, and present an entity-sentiment word pair mining method for similarity feature extraction. The propagation of trust is calculated according to the transitivity feature. Using the proposed trust representation model, the shortest path to describe the tightness of trust and put forward an improved shortest path algorithm to figure out the propagation trust relationship between users. Set of review data from our website is collected. The experimental results indicate that the sentiment similarity analysis can be an efficient method to and trust between users in Ecommerce system.

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CHAPTER 12

12. CONCLUSION AND FUTURE ENHANCEMENT

Our project concluded that how e-commerce will transform online agribusiness is still indeterminate. Stronger connection between farmers and consumers may result in more differentiated products that meet consumer needs. E-commerce offers an alternative venue of promoting and marketing agricultural products that has a benefit of reaching extensive geographical populations and providing detailed product information at a relatively low cost. Markets may become more transparent. As the Internet transcends geography the globalization of the sector may become a reality. Transformation is about change and change creates winners and losers. The winners will be the fast innovators best. In future, expect a cloud based database and make our agribusiness through worldwide with the above all qualities.

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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 Expressions to 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, Heap Management - 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.

LIST OF EXPERIMENTS:

1. Develop a lexical analyzer to recognize a few patterns in C. (Ex. identifiers, constants, comments, operators etc.). Create a symbol table, while recognizing identifiers.
2. Implement a Lexical Analyzer using Lex Tool
3. Implement an Arithmetic Calculator using LEX and YACC
4. Generate three address code for a simple program using LEX and YACC.
5. Implement simple code optimization techniques (Constant folding, Strength reduction and Algebraic transformation)
6. Implement back-end of the compiler for which the three address code is given as input and the 8086 assembly language code is produced as output.

PRACTICALS 30 PERIODS
THEORY 45 PERIODS
TOTAL : 75 PERIODS

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

- Understand the different phases of compiler.
- Design a lexical analyzer for a sample language.
- Apply different parsing algorithms to develop the parsers for a given grammar.
- Understand syntax-directed translation and run-time environment.
- Learn to implement code optimization techniques and a simple code generator.
- Design and implement a scanner and a parser using LEX and YACC tools.

OUTCOMES:
On Completion of the course, the students should be able to:
- Understand the different phases of compiler.
- Design a lexical analyzer for a sample language.
- Apply different parsing algorithms to develop the parsers for a given grammar.
- Understand syntax-directed translation and run-time environment.
- Learn to implement code optimization techniques and a simple code generator.
- Design and implement a scanner and a parser using LEX and YACC tools.

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: A Dependence based Approach, Morgan Kaufmann Publishers, 2002.
2. Steven S. Muchnick, Advanced Compiler Design and Implementation‖, Morgan Kaufmann Publishers - Elsevier Science, India, Indian Reprint 2003.
3. Keith D Cooper and Linda Torczon, Engineering a Compiler‖, Morgan Kaufmann Publishers 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.

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8th , Nov 2021

To Whom So Ever It May Concern

This is to certify that **Mr. Thiyagarajan. S** Department of Computer Science & Engineering, NPR College of Engineering & Technology, Natham, Dindigul has undergone internship training from **11.10.21 to 25.10.2021** in our organization.

During the period of her training, she had shown keen interest towards learning.

She demonstrated good design skills with self-motivated attitude to learn new things.

We wish her future endeavor.

Yours Sincerely,
For **CMS IT Services Pvt Ltd.,**

Authorized Signatory

Dr. J.SUNDARARAJAN,
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CS8603   **DISTRIBUTED SYSTEM**   **L T P C**
                                                                         3 0 0 3

OBJECTIVES:

· To understand the foundations of distributed systems.

· To learn issues related to clock Synchronization and the need for global state in distributed systems.

· To learn distributed mutual exclusion and deadlock detection algorithms.

· To understand the significance of agreement, fault tolerance and recovery protocols in Distributed 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

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· 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 and Design", Fifth Edition, Pearson Education, 2012.

REFERENCES:

1. Pradeep K Sinha, "Distributed Operating Systems: Concepts and Design", Prentice Hall of India, 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.

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04ᵗʰ Oct 2021

To Whom So Ever It May Concern

This is to certify that **Mr.Vineethpandian S**, Department of Computer Science & Engineering, NPR College of Engineering & Technology, Natham, Dindigul has undergone implant training from **20.09.2021 to 27.09.2021** in our organization.

During the period of her training, she had shown keen interest towards learning.

She demonstrated good design skills with self-motivated attitude to learn new things.

We wish him future endeavor.

Yours Sincerely,
For CMS IT Services Pvt Ltd.,

R. 2~

Authorized Signatory

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OBJECTIVES:

· To learn the criteria for test cases.

· To learn the design of test cases.

· To understand test management and test automation techniques.

· To apply test metrics and measurements.

UNIT I INTRODUCTION   9

Testing as an Engineering Activity – Testing as a Process – Testing Maturity Model- Testing axioms – Basic definitions – Software Testing Principles – The Tester's Role in a Software Development Organization – Origins of Defects – Cost of defects – Defect Classes – The Defect Repository and Test Design –Defect Examples- Developer/Tester Support of Developing a Defect Repository.

UNIT II TEST CASE DESIGN STRATEGIES   9

Test case Design Strategies – Using Black Box Approach to Test Case Design – Boundary Value Analysis – Equivalence Class Partitioning – State based testing – Cause-effect graphing – Compatibility testing – user documentation testing – domain testing - Random Testing – Requirements based testing – Using White Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing – Coverage and Control Flow Graphs – Covering Code Logic – Paths – code complexity testing – Additional White box testing approaches- Evaluating Test Adequacy Criteria.

UNIT III LEVELS OF TESTING   9

The need for Levels of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests – The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination System Testing – Acceptance testing – Performance testing – Regression Testing – Internationalization testing – Ad-hoc testing – Alpha, Beta Tests – Testing OO systems – Usability and Accessibility testing – Configuration testing –Compatibility testing – Testing the documentation – Website testing.

UNIT IV TEST MANAGEMENT   9

People and organizational issues in testing – Organization structures for testing teams – testing services – Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process – Reporting Test Results – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group- The Structure of Testing Group- .The Technical Training Program.

UNIT V TEST AUTOMATION   9

Software test automation – skills needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation – Test metrics and measurements – project, progress and productivity metrics.

TOTAL: 45 PERIODS

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

· Design test cases suitable for a software development for different domains.

· Identify suitable tests to be carried out.

· Prepare test planning based on the document.

· Document test plans and test cases designed.

· Use automatic testing tools.

· Develop and validate a test plan.

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Triflorum Engineering and Business Solutions

Date: 27.09.21

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Surya K** , third year student of BE-Computer science and Engineering, **NPR college of Engineering & Technology, Natham, Dindigul**, has successfully completed implant training in our organization from **06.09.2021 to 13.09.21.**

During the above period we found him sincere and hardworking. He has taken proper initiative efforts towards completed his training.

We wish him all the best for the future career.

Managing Director

Mr.S.Kumaraguru

Dr. A.SUNDARARAJAN,
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CS8792	CRYPTOGRAPHY AND NETWORK SECURITY	L	T	P	C
		3	0	0	3

OBJECTIVES:
- To understand Cryptography Theories, Algorithms and Systems.
- To understand necessary Approaches and Techniques to build protection mechanisms in order to secure computer networks.

UNIT I   INTRODUCTION   9

Security trends - Legal, Ethical and Professional Aspects of Security, Need for Security at Multiple levels, Security Policies - Model of network security – Security attacks, services and mechanisms – OSI security architecture – Classical encryption techniques: substitution techniques, transposition techniques, steganography- Foundations of modern cryptography: perfect security – information theory – product cryptosystem – cryptanalysis.

UNIT II   SYMMETRIC KEY CRYPTOGRAPHY   9

MATHEMATICS OF SYMMETRIC KEY CRYPTOGRAPHY: Algebraic structures - Modular arithmetic-Euclid"s algorithm- Congruence and matrices - Groups, Rings, Fields- Finite fields- SYMMETRIC KEY CIPHERS: SDES – Block cipher Principles of DES – Strength of DES – Differential and linear cryptanalysis - Block cipher design principles – Block cipher mode of operation – Evaluation criteria for AES – Advanced Encryption Standard - RC4 – Key distribution.

UNIT III   PUBLIC KEY CRYPTOGRAPHY   9

MATHEMATICS OF ASYMMETRIC KEY CRYPTOGRAPHY: Primes – Primality Testing – Factorization – Euler's totient function, Fermat's and Euler's Theorem - Chinese Remainder Theorem – Exponentiation and logarithm - ASYMMETRIC KEY CIPHERS: RSA cryptosystem – Key distribution – Key management – Diffie Hellman key exchange - ElGamal cryptosystem – Elliptic curve arithmetic-Elliptic curve cryptography.

UNIT IV   MESSAGE AUTHENTICATION AND INTEGRITY   9

Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC – SHA –Digital signature and authentication protocols – DSS- Entity Authentication: Biometrics, Passwords, Challenge Response protocols- Authentication applications - Kerberos, X.509

UNIT V   SECURITY PRACTICE AND SYSTEM SECURITY   9

Electronic Mail security – PGP, S/MIME – IP security – Web Security - SYSTEM SECURITY: Intruders – Malicious software – viruses – Firewalls.

TOTAL45PERIODS

OUTCOMES:

At the end of the course, the student should be able to:
- Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
- Apply the different cryptographic operations of symmetric cryptographic algorithms
- Apply the different cryptographic operations of public key cryptography
- Apply the various Authentication schemes to simulate different applications.

TEXT BOOK:
1. William Stallings, Cryptography and Network Security: Principles and Practice, PHI 3rd Edition, 2006.

REFERENCES:
1. C K Shyamala, N Harini and Dr. T R Padmanabhan: Cryptography and Network Security, Wiley India Pvt.Ltd
2. BehrouzA.Foruzan, Cryptography and Network Security, Tata McGraw Hill 2007.
3. Charlie Kaufman, Radia Perlman, and Mike Speciner, Network Security: PRIVATE Communication in a PUBLIC World, Prentice Hall, ISBN 0-13-
4.

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PRIVACY BASED IMAGE SHARING IN SOCIAL NETWORKS USING WAVELET TRANSFORM

A PROJECT REPORT

Submitted by

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JUNE 2022

i

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ABSTRACT

Image over the social network is transferred or transmitted between servers and mobile users. Privacy of that data is very important as it belongs to personal sensitive information. If image gets hacked by the hacker, can be used to defame a person's social data. In existing system, text-based encryption can be implemented in mobile cloud computing. There are many different approached of storing data securely over the cloud, using mobile computing such as end-to-end encrypted data transmission, dynamic credential generation only for text data. In this project, we can introduce a novel watermarking scheme with wavelet algorithm named as discrete wavelet transform in real time social network application as Facebook. In this scheme we can use images and stored in server in secure format. And also extend the project; we categorize the picture as sensitive or normal. If it is sensitive means, perform copyrights algorithms. Then provide the permission to the receiver end for download the images in secure manner. Experimental result can be shows that in real time mobile cloud environments using C#.NET as front end and SQL SERVER as back end and comparative study of existing algorithms based on computational time and privacy rate.

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III

CHAPTER 12

CONCLUSION AND FUTURE ENHANCEMENT

11.1 CONCLUSION

The appearance of well-known online social networking has triggered within the compromise of conventional notions of privateness, certainly in visual media. With a view to facilitate useful and principled protection of picture privateness online, we have got supplied the design, implementation, and evaluation of photo shield gadget that successfully and successfully protects client's photo privateness across famous OSNs. The digital watermarking approach based fully on DWT coefficients modification for social networking offerings has been presented on this paper. In the embedding manner, the coefficients in LL sub-band had been used to embed watermark. Within the extraction process, normal coefficient prediction based on imply clear out is used to boom the accuracy of the extracted watermark.

11.2 FUTURE ENHANCEMENT

As part of future work, to implement cryptographic techniques and various filtering techniques to secure OSN home page. And also extend the work in privacy based uploaded video content sharing sites. The experimental outcome confirmed a larger overall efficiency in specific time application.

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OBJECTIVES:
- To understand the concept of cloud computing.
- To appreciate the evolution of cloud from the existing technologies.
- To have knowledge on the various issues in cloud computing.
- To be familiar with the lead players in cloud.
- To appreciate the emergence of cloud as the next generation computing paradigm.

UNIT I   INTRODUCTION   9
Introduction to Cloud Computing – Definition of Cloud – Evolution of Cloud Computing –
Underlying Principles of Parallel and Distributed Computing – Cloud Characteristics –
Elasticity in Cloud – On-demand Provisioning.

UNIT II   CLOUD ENABLING TECHNOLOGIES   10
Service Oriented Architecture – REST and Systems of Systems – Web Services –
Publish- Subscribe Model – Basics of Virtualization – Types of Virtualization –
Implementation Levels of Virtualization – Virtualization Structures – Tools and
Mechanisms – Virtualization of CPU – Memory – I/O Devices –Virtualization Support and
Disaster Recovery.

UNIT III   CLOUD ARCHITECTURE, SERVICES AND STORAGE   8
Layered Cloud Architecture Design – NIST Cloud Computing Reference Architecture –
Public, Private and Hybrid Clouds - IaaS – PaaS – SaaS – Architectural Design
Challenges – Cloud Storage – Storage-as-a-Service – Advantages of Cloud Storage –
Cloud Storage Providers – S3.

UNIT IV   RESOURCE MANAGEMENT AND SECURITY IN CLOUD   10
Inter Cloud Resource Management – Resource Provisioning and Resource Provisioning
MethodsGlobal Exchange of Cloud Resources – Security Overview – Cloud Security
Challenges – Software-as-a-Service Security – Security Governance – Virtual Machine
Security – IAM – Security Standards.

UNIT V   CLOUD TECHNOLOGIES AND ADVANCEMENTS   8
Hadoop – MapReduce – Virtual Box -- Google App Engine – Programming
Environment for Google App Engine — Open Stack – Federation in the Cloud – Four
Levels of Federation – Federated Services and Applications – Future of Federation.
                                                       TOTAL: 45 PERIODS

OUTCOMES:
On Completion of the course, the students should be able to:
TOTAL: 45 PERIODS
- Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
- Learn the key and enabling technologies that help in the development of cloud.
- Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.

TEXT BOOKS:
1. Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.
2. Rittinghouse, John W., and James F. Ransome, ―Cloud Computing: Implementation, Management and Security‖, CRC Press, 2017.

REFERENCES:
1. Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi, ―Mastering Cloud Computing‖, Tata Mcgraw Hill, 2013.
2. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing - A Practical Approach‖, Tata Mcgraw Hill, 2009.

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A PROJECT REPORT

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in partial fulfilment for the award of the degree

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ABSTRACT

The storage service is excellent unless users outsource their sensitive data to cloud storage server. Cloud server gets full access and control over user's data once data is outsourced to the cloud. It can read or search through the user's data. Privacy breach, malicious modification and data loss are emerging cyber threats against a cloud storage. Recently, fog server based three-layer architecture has been presented for secure storage. In that architecture, the portion of data to be stored in cloud, fog and user's local machine. Some portion of data in the cloud and their customized hash algorithm, take extra computation/storage overhead. In this project, we have used a fog-based cloud storage scheme. In that scheme, data is splitted into multiple blocks through XOR-combination and combine this blocks into 2-blocks or 3- blocks using XOR-operation. So using this scheme, we enhance the efficiency of fog based cloud storage service and improve the security of fog server for a robust fog centric cloud computing infrastructure and we enhance crypto system to secure data without revealing any information from it. Fog centric secure cloud storage scheme protect data against unauthorized access, modification and destruction.

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iv

CHAPTER 12

CONCLUSION AND FUTURE ENHANCEMENT

12.1 CONCLUSION

Fog based three-layer architecture befits to a secure solution for robust cloud storage against cyber threats. This project we proposed a scheme that undertakes preventive activities to a trusted fog server and puts the actual data in twisted format to multiple cloud servers. We enhanced the efficiency of fog based cloud storage service. We improve the security of fog server for a robust fog centric cloud computing infrastructure.

12.2 FUTURE ENHANCEMENT

- To enhance the efficiency of fog based cloud storage service.
- To improve the security of fog server for a robust fog centric cloud computing infrastructure.
- To enable cloud server to compute cryptic data without revealing any information from it.

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Natham, Dindigul (Dt) - 624 401.

OBJECTIVES:

- To understand the functions of the basic components of a Robot.
- To study the use of various types of End of Effectors and Sensors
- To impart knowledge in Robot Kinematics and Programming
- To learn Robot safety issues and economics.

UNIT I   FUNDAMENTALS OF ROBOT   6

Robot - Definition - Robot Anatomy - Coordinate Systems, Work Envelope Types and Classification- Specifications-Pitch, Yaw, Roll, Joint Notations, Speed of Motion, Pay Load-Robot Parts and their Functions-Need for Robots-Different Applications.

UNIT II   ROBOT DRIVE SYSTEMS AND END EFFECTORS   9

Pneumatic Drives-Hydraulic Drives-Mechanical Drives-Electrical Drives-D.C. Servo Motors, Stepper Motors, A.C. Servo Motors-Salient Features, Applications and Comparison of all these Drives, End Effectors-Grippers-Mechanical Grippers, Pneumatic and Hydraulic-Grippers, Magnetic Grippers, Vacuum Grippers; Two Fingered and Three Fingered Grippers; Internal Grippers and External Grippers; Selection and Design Considerations.

UNIT III   SENSORS AND MACHINE VISION   12

Requirements of a sensor, Principles and Applications of the following types of sensors-Position sensors - Piezo Electric Sensor, LVDT, Resolvers, Optical Encoders, pneumatic Position Sensors, Range Sensors Triangulations Principles, Structured, Lighting Approach, Time of Flight, Range Finders, Laser Range Meters, Touch Sensors ,binary Sensors., Analog Sensors, Wrist Sensors, Compliance Sensors, Slip Sensors, Camera, Frame Grabber, Sensing and Digitizing Image Data- Signal Conversion, Image Storage, Lighting Techniques, Image Processing and Analysis-Data Reduction, Segmentation, Feature Extraction, Object Recognition, Other Algorithms, Applications- Inspection, Identification, Visual Serving and Navigation.

UNIT IV   ROBOT KINEMATICS AND ROBOT PROGRAMMING   13

Forward Kinematics, Inverse Kinematics and Difference; Forward Kinematics and Reverse Kinematics of manipulators with Two, Three Degrees of Freedom (in 2 Dimension), Four Degrees of freedom (in 3 Dimension) Jacobians, Velocity and Forces-Manipulator Dynamics, Trajectory Generator, Manipulator Mechanism Design-Derivations and problems. Lead through Programming, Robot programming Languages-VAL Programming-Motion Commands, Sensor Commands, End Effector commands and simple Programs.

UNIT V   IMPLEMENTATION AND ROBOT ECONOMICS   5

RGV, AGV; Implementation of Robots in Industries-Various Steps; Safety Considerations for Robot Operations - Economic Analysis of Robots.

TOTAL: 45 PERIODS

OUTCOME:

Upon completion of this course, the students can able to apply the basic engineering knowledge for the design of robotics

TEXT BOOKS:

1. Klafter R.D., Chmielewski T.A and Negin M., "Robotic Engineering - An Integrated Approach", Prentice Hall, 2003.
2. Groover M.P., "Industrial Robotics -Technology Programming and Applications", McGraw Hill, 2001.

REFERENCES:

1. Craig J.J., "Introduction to Robotics Mechanics and Control", Pearson Education, 2008.
2. Deb S.R., "Robotics Technology and Flexible Automation" Tata McGraw Hill Book Co.,
3. Koren Y., "Robotics for Engineers", Mc Graw Hill Book Co., 1992.

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C3 TECHNOLOGIES
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An ISO 20000:2010 Certified Institution

52/33, T.Nagar 3rd Cross, Ramanathapuram, Coimbatore -641 045.

Ph: 72000 55778 / 98435 55778.   E-mail: c3technologiescbe@gmail.com

Date: 16,08,2021

CERTIFICATE OF IN-PLANT TRAINING

This is to certify that Ms. Nivedha R from NPR College Engineering and Technology has successfully completed inplant training from 02.08.2021 to 09.08.2021 in our organization.

During the tenure of training, we found him very sincere, attentive and good behaviour.

Dr. J.SUNDARARAJAN,
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For C3 TECHNOLOGIES

Managing Director

GE8077   **TOTAL QUALITY MANAGEMENT**   L T P C
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OBJECTIVE:
- To facilitate the understanding of Quality Management principles and process.

UNIT I   INTRODUCTION   9
Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, Customer retention.

UNIT II   TQM PRINCIPLES   9
Leadership - Quality Statements, Strategic quality planning, Quality Councils - Employee involvement - Motivation, Empowerment, Team and Teamwork, Recognition and Reward, Performance appraisal - Continuous process improvement - PDCA cycle, 5S, Kaizen - Supplier partnership - Partnering, Supplier selection, Supplier Rating.

UNIT III   TQM TOOLS AND TECHNIQUES I   9
The seven traditional tools of quality - New management tools - Six sigma: Concepts, Methodology, applications to manufacturing, service sector including IT - Bench marking - Reason to bench mark, Bench marking process - FMEA - Stages, Types.

UNIT IV   TQM TOOLS AND TECHNIQUES II   9
Quality Circles - Cost of Quality - Quality Function Deployment (QFD) - Taguchi quality loss function - TPM - Concepts, improvement needs - Performance measures.

UNIT V   QUALITY MANAGEMENT SYSTEM   9
Introduction—Benefits of ISO Registration—ISO 9000 Series of Standards—Sector-Specific Standards—AS 9100, TS16949 and TL 9000-- ISO 9001 Requirements—Implementation—Documentation—Internal Audits—Registration- **ENVIRONMENTAL MANAGEMENT SYSTEM:** Introduction—ISO 14000 Series Standards—Concepts of ISO 14001—Requirements of ISO 14001—Benefits of EMS.

OUTCOME:

                                                          TOTAL: 45 PERIODS
- The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.

TEXT BOOK:
1. Dale H.Besterfiled, Carol B.Michna,Glen H. Besterfield,Mary B.Sacre,Hemant Urdhwareshe and Rashmi Urdhwareshe, —Total Quality Managementll, Pearson Education Asia, Revised Third Edition, Indian Reprint, Sixth Impression, 2013.

REFERENCES:
1. James R. Evans and William M. Lindsay, "The Management and Control of Quality", 8th Edition, First Indian Edition, Cengage Learning, 2012.
2. Janakiraman. B and Gopal .R.K., "Total Quality Management - Text and Cases", Prentice Hall (India) Pvt. Ltd., 2006.
3. Suganthi.L and Anand Samuel, "Total Quality Management", Prentice Hall (India) Pvt. Ltd., 2006.
4. ISO9001-2015 standards

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Date: 20.08.2021

CERTIFICATE OF COMPLETION

This is to certify that Ms. Vijaya Bharathi P student of BE-CSE final year, NPR college of Engineering & Technology, Natham, Dindigul, has successfully completed inplant training from 09.08.2021 to 16.08.2021.

During this period his performance was found good.

We wish him good luck for all the future endeavours and looks forward to work in future.

For Xplore IT Corp

Authorized Signatory

Dr. J.SUNDARARAJAN,
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OBJECTIVES:
- To learn the foundations of Human Computer Interaction.
- To become familiar with the design technologies for individuals and persons with disabilities.
- To be aware of mobile HCI.
- To 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. - **Case Studies**

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
HCI Models: Cognitive models: Socio-Organizational issues and stakeholder 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. - **Case Studies**

UNIT V   WEB INTERFACE DESIGN   9
Designing Web Interfaces – Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow - **Case Studies**
OUTCOMES:
Upon completion of the course, the students should be able to:
- Design effective dialog for HCI
- Design effective HCI for individuals and persons with disabilities.
- Assess the importance of user feedback.

TOTAL :45 PERIODS
- Explain the HCI implications for designing multimedia/ ecommerce/ e-learning Web sites.
- Develop meaningful user interface.

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)
3. Bill Scott and Theresa Neil, ―Designing Web Interfaces‖, First Edition, O'Reilly, 2009. (UNIT-V)

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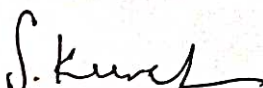
Triflorum Engineering and Business Solutions

Date: 05.11.2021

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. Saraniya M**, final year student of BE-Computer science and Engineering, **NPR college of Engineering & Technology, Natham, Dindigul**, has successfully completed Internship in our organization from **13.10.2021** to **28.10.2021**.

During the above period we found him sincere and hardworking. She has taken proper initiative efforts towards completed his training.

We wish her all the best for the future career.

Managing Director
Mr.S.Kumaraguru

Dr. **J.SUNDARARAJAN,**
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OBJECTIVES:

* To enable the students to create an awareness on Engineering Ethics and Human Values, to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

UNIT I   HUMAN VALUES   10

Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self-confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

UNIT II   ENGINEERING ETHICS   9

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles - Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories.

UNIT III   ENGINEERING AS SOCIAL EXPERIMENTATION   9

Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

UNIT IV   SAFETY, RESPONSIBILITIES AND RIGHTS   9

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk - Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination.

UNIT V   GLOBAL ISSUES   8

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership –Code of Conduct – Corporate Social Responsibility.

TOTAL: 45 PERIODS

OUTCOMES:

* Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

TEXT BOOKS:

1. Mike W. Martin and Roland Schinzinger, ―Ethics in Engineering‖, Tata McGraw Hill, New Delhi, 2003.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, ―Engineering Ethics‖, Prentice Hall of India, New Delhi, 2004.

REFERENCES:

1. Charles B. Fleddermann, ―Engineering Ethics‖, Pearson Prentice Hall, New Jersey, 2004.
2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, ―Engineering Ethics – Concepts and Cases‖, Cengage Learning, 2009.
3. John R Boatright, ―Ethics and the Conduct of Business‖, Pearson Education, New Delhi, 2003
4. Edmund G Seebauer and Robert L Barry, ―Fundamentals of Ethics for Scientists and Engineers‖, Oxford University Press, Oxford, 2001.
5. Laura P. Hartman and Joe Desjardins, ―Business Ethics: Decision Making for Personal Integrity and Social Responsibility‖ Mc Graw Hill education, India Pvt. Ltd.,New Delhi, 2013.

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4th Oct' 2021

To Whom So Ever It May Concern

This is to certify that **Mr. Prakash P,** Department of Computer Science & Engineering, NPR College of Engineering & Technology, Natham, Dindigul has undergone implant training from 20.09.2021 to 27.09.2021 in our organization.

During the period of his training, he had shown keen interest towards learning.

He demonstrated good design skills with self-motivated attitude to learn new things.

We wish him future endeavor.

Yours Sincerely,

For **CMS IT Services Pvt Ltd.,**

Authorized Signatory,

Dr. J.SUNDARARAJAN,

B.E., M.Tech., Ph.D.,

Principal

NPR College of Engineering & Technology

Natham, Dindigul (Dt) - 624 401.

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OBJECTIVES:
- To learn the fundamentals of Green Computing.
- To analyze the Green computing Grid Framework.
- To understand the issues related with Green compliance.
- To study and develop various case studies.

UNIT I   FUNDAMENTALS   9

Green IT Fundamentals: Business, IT, and the Environment – Green computing: carbon foot print, scoop on power – Green IT Strategies: Drivers, Dimensions, and Goals – Environmentally Responsible Business: Policies, Practices, and Metrics.

UNIT II   GREEN ASSETS AND MODELING   9

Green Assets: Buildings, Data Centers, Networks, and Devices – Green Business Process Management: Modeling, Optimization, and Collaboration – Green Enterprise Architecture – Environmental Intelligence – Green Supply Chains – Green Information Systems: Design and Development Models.

UNIT III   GRID FRAMEWORK   9

Virtualization of IT systems – Role of electric utilities, Telecommuting, teleconferencing and teleporting – Materials recycling – Best ways for Green PC – Green Data center – Green Grid framework.

UNIT IV   GREEN COMPLIANCE   9

Socio-cultural aspects of Green IT – Green Enterprise Transformation Roadmap – Green Compliance: Protocols, Standards, and Audits – Emergent Carbon Issues: Technologies and Future.

UNIT V   CASE STUDIES   9

The Environmentally Responsible Business Strategies (ERBS) – Case Study Scenarios for Trial Runs – Case Studies – Applying Green IT Strategies and Applications to a Home, Hospital, Packaging Industry and Telecom Sector.

TOTAL :   45   PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to:
- Acquire knowledge to adopt green computing practices to minimize negative impacts on the environment.
- Enhance the skill in energy saving practices in their use of hardware.
- Evaluate technology tools that can reduce paper waste and carbon footprint by the stakeholders.
- Understand the ways to minimize equipment disposal requirements .

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TEXT BOOKS:

1. Bhuvan Unhelkar, "Green IT Strategies and Applications-
   Using EnvironmentalIntelligence", CRC Press, June 2014.
2. Woody Leonhard, Katherine Murray, "Green Home
   computing for dummies",August 2012.

REFERENCES:

1. Alin Gales, Michael Schaefer, Mike Ebbers, "Green Data Center: steps for
   theJourney", Shroff/IBM rebook, 2011.
2. John Lamb, "The Greening of IT", Pearson Education, 2009.
3. Jason Harris, "Green Computing and Green IT- Best Practices on regulations
   &industry", Lulu.com, 2008
4. Carl speshocky, "Empowering Green Initiatives with IT", John Wiley & Sons,
   2010.
5. Wu Chun Feng (editor), "Green computing: Large Scale energy efficiency",
   CRCPress

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Date: 30.08.2021

CERTIFICATE OF COMPLETION

This is to certify that Ms. Mangala Dharshini R student of BE-CSE third year, NPR college of Engineering & Technology, Natham, Dindigul, has successfully completed internship training from 12.08.2021 to 26.08.2021.

During this period his performance was found good.

We wish him good luck for all the future endeavours and looks forward to work in future.

For Xplore IT Corp

Authorized Signatory

Dr. J.SUNDARARAJAN,
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OBJECTIVES:

- To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same. To train the students in preparing project reports and to face reviews and viva voce examination. The students in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and intenal examiners constituted by the Head of the Department.

                                                      TOTAL: 180 PERIODS

OUTCOMES:

- On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

Dr. **J.SUNDARARAJAN,**
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Natham, Dindigul (Dt) - 624 401.

DRIVER FATIGUE RECOGNITION BASED USER FACIAL FEATURES USING CONVOLUTIONAL NEURAL NETWORK

A PROJECT REPORT

Submitted by

A. KANMANI	(920818104011)
S. KARTHIGA JOTHI	(920818104012)
V. SANTHOSHINI	(920818104030)

In partial fulfilment for the award of the degree

Of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE ENGINEERING

NPR COLLEGE OF ENGINEERING AND TECHNOLOGY,

NATHAM, DINDIGUL.

ANNA UNIVERSITY:: CHENNAI 600 025

JUNE 2022

Dr. J. SUNDARARAJAN,
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ABSTRACT

Drowsiness and fatigue of automobile drivers reduce the drivers' abilities of car manage, herbal reflex, recognition and notion. Such diminished vigilance stage of drivers is found at night time driving or overdriving, causing twist of fate and pose extreme danger to mankind and society. Therefore, it is very tons essential in this recent fashion in vehicle industry to include driving force help system which could hit upon drowsiness and fatigue of the drivers. This undertaking offers a nonintrusive prototype computer vision gadget for monitoring a driving force's vigilance in real time. Eye tracking is one of the key technologies for destiny motive force help systems for the reason that human eyes contain lots statistics approximately the driver's condition which includes gaze, attention stage, and fatigue degree. One problem commonplace too many eye monitoring strategies proposed to this point is their sensitivity to lighting fixtures situation exchange. This has a tendency to seriously restrict their scope for car packages. Real-time detection and monitoring of the attention is an energetic region of research in laptop imaginative and prescient community. Localization and monitoring of the attention can be beneficial in face alignment. This challenge describes actual time eye detection and tracking approach that works underneath variable and sensible lighting fixtures situations. It is primarily based on a hardware device for the real-time acquisition of a driving force's snap shots the use of digital camera and the software program implementation for monitoring eye that can avoid the accidents.

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CHAPTER 11

11. CONCLUSION AND FUTURE ENHANCEMENT

11.1 CONCLUSION

Drowsiness and fatigue of automobile drivers reduce the drivers' abilities of vehicle control, natural reflex, recognition and perception. Such diminished vigilance level of drivers is observed at night driving or overdriving, causing accident and pose severe threat to mankind and society. The proposed system can be used for driver's safety and its consequences. The system detects drowsiness of driver through eye conditions. It based on face detection using well known Linear Discriminative algorithm, eyes are detected through proposed crop Eye algorithm which segments the face in different segments in order to get left and right eye. Conditions of open and close eye are determined by intensity values, distance between eye brow and eye lash is calculated. If calculated distance is greater than threshold value, eyes are closed otherwise open. An alarm is triggered if eyes are found to be closed for consecutive frames. The proposed method was tested in video sequence recorded in vehicle as well as in lab environment. The proposed system works in real time with minimal computational complexity. Therefore, it is also suitable for implementing in surveillance environment. The system produces 90% accurate results for different faces.

11.2 FUTURE ENHANCEMENT

However, its limitation is detecting the eyes of person wearing glasses. Also it does not produce accurate results if any reflective object is found behind the driver. In future, we can consider the limitations and implemented with embedded system

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