R1. CONDITION FOR ADMISSION

Candidates for admission to M.E. Degree programme in Computer Science Engineering shall be required to have passed the B.E./B.Tech Computer Science and Engineering or B.E. / B.Tech Electrical and Electronics or B.E./B.Tech Electronics and Communication or B.E./B.Tech Electronics and Instrumentation or B.E./B.Tech Instrumentation and Control or B.E./B.Tech Information technology or Graduates of any other authority accepted by the syndicate of this University as equivalent thereto. They shall satisfy the conditions regarding qualifying marks, and physical fitness as may be prescribed from time to time by the syndicate of the Annamalai University. The candidates who underwent the degree programme under a Part-time scheme, should possess two years of professional experience after passing the B.E. degree examination. Admission to ME. (CSE) part time programme is restricted to those working within a radius of 75km from Annamalainagar.

R2. CREDITS

ME full-time programme will have a duration of four semesters. ME part-time programme will have a duration of six semesters.

The number of credits for each semester for the full-time programme shall be as follows:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First and second semesters</td>
<td>20 credits per semester</td>
</tr>
<tr>
<td>Third Semester</td>
<td>12 credits</td>
</tr>
<tr>
<td>Fourth Semester</td>
<td>13 credits</td>
</tr>
</tbody>
</table>

The number of credits for each semester of the part-time programme shall be as follows:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First to fourth semesters</td>
<td>an average of 10 credits per semester</td>
</tr>
<tr>
<td>Fifth semester</td>
<td>12 credits</td>
</tr>
<tr>
<td>Sixth semester</td>
<td>13 credits</td>
</tr>
</tbody>
</table>

The total credits for both the programmes will be 65 each. For the award of the degree, a student has to earn a minimum of 65 credits.

R3. DURATION OF THE PROGRAMME

A student of the full-time programme is normally expected to complete in four semesters but in any case not more than four years from the time of admission.

A student of the part-time programme is normally expected to complete in six semesters but in any case not more than six years from the time of admission.

R4. REGISTRATION FOR COURSES

A student newly admitted will automatically be registered for all the courses prescribed for the first semester, without any option.

Every other student shall submit a completed registration form indicating the list of courses intended to be credited during the next semester. This registration will be done a week before the last working day of the current semester. Late registration with
the approval of the Dean on the recommendation of the Head of the Department along with a late fee will be done up to the last working day.

Registration for the thesis phase-I and phase-II shall be done at the appropriate semesters.

R5. ASSESSMENT

The break-up of assessment and examination marks for theory and practical subjects is as follows.

<table>
<thead>
<tr>
<th>Assessment Type</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>First assessment (I Mid Term Test)</td>
<td>15</td>
</tr>
<tr>
<td>Second assessment (II Mid Term Test)</td>
<td>15</td>
</tr>
<tr>
<td>Third assessment</td>
<td>10</td>
</tr>
<tr>
<td>Examination</td>
<td>60</td>
</tr>
</tbody>
</table>

The thesis phase-I will be assessed for 40 marks by a committee consisting of the Head of the Department, the guide and a minimum of two members nominated by the Head of the Department. The Head of the Department will be the chairman. 60 marks are allotted for the thesis work and viva voce examination at the end of the pre-final semester. The same procedure will be adopted in the final semester also.

R6. COUNSELLOR

To help the students in planning their course of study and for general advice on the academic programme, the Head of the Department will attach a certain number of students to a member of the faculty who shall function as counsellor throughout their period of study. Such counsellors shall advise the students, give preliminary approval for the courses to be taken by the students during each semester and obtain the final approval of the Head of the Department.

R7. CLASS COMMITTEE

For each semester, separate class committee will be constituted by the respective Heads of Departments.

The composition of the class committee for each semester except the final semester shall be as follows:

Teachers of the individual courses.

A project co-coordinator (in the pre-final and final semester committees only) who shall be appointed by the Head of the Department from among the project supervisors.

One professor or Reader, preferably not teaching the concerned class, appointed as chairman by the Head of the Department.

The Head of the Department may opt to be a member or the Chairman.

All counsellors of the class, the Head of the Department (if not already a member) and any staff member nominated by the Head of the Department may serve as special invitees.

The class committee shall meet four times during the semester.

The first meeting will be held within two weeks from the date of commencement of the class to decide the type of assessment like test, assignment etc. for the three assessments and the dates of completion of the assessments.
The second and third meetings will be held within a week after the completion of the first and second assessments respectively to review the performance and for follow-up action.

The fourth meeting will be held on completion of all the assessments except the end semester examination and at least one week before the commencement of the end semester examinations.

During this meeting the assessment on a maximum of 40 marks will be finalised for every student and tabulated and submitted to the Head of the Department for approval and transmission to the Controller of Examinations.

R8. WITHDRAWAL FROM A COURSE

A student can withdraw from a course at any time before a date fixed by the Head of the Department prior to the second assessment, with the approval of the Dean of the faculty on the recommendation of the Head of the Department.

R9. TEMPORARY BREAK OF STUDY

A student can take a one-time temporary break of study covering the current semester and/or the next semester with the approval of the Dean on the recommendation of the Head of the Department, not later than seven days after the completion of the second assessment test. However, the student must complete the entire programme within the maximum period of four years for full-time and six years for part-time.

R10. MOVEMENT TO THE PRE-FINAL SEMESTER

A minimum of 24 credits must be earned by the student to move to the pre-final semester. The results of the final semester will be withheld until the student passes all the previous semester examinations.

R11. SUBSTITUTE ASSESSMENTS

A student who has missed one or more of the assessments of a course other than the end semester examination, for genuine reasons accepted by the Head of the Department, may take a substitute assessment for any one of the missed assessments. The substitute assessment must be completed before the date of the fourth meeting of the respective class committee.

A student who wishes to have a substitute assessment must apply to the Head of the Department within a week from the date of the missed assessment.

R12. ATTENDANCE REQUIREMENTS

To be eligible to appear for the examination in a particular course, a student must put in a minimum of 80% of attendance in that course. However, if the attendance is 75% or above but less than 80% in any course, the authorities can permit the student to appear for the examination in that course on payment of the prescribed condonation fee.

A student who withdraws from or does not meet the minimum attendance requirement in a course must re-register for and repeat the course.

R13. PASSING & DECLARATION OF EXAMINATION RESULTS

All assessments of all the courses on an absolute marks basis will be considered and passed by the respective results passing boards in accordance with the rules of the University. The marks for each course shall be converted to the corresponding letter
grade as follows. Thereafter, computation of the Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) shall be done.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Marks Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>90 to 100 marks</td>
</tr>
<tr>
<td>A</td>
<td>80 to 89 marks</td>
</tr>
<tr>
<td>B</td>
<td>70 to 79 marks</td>
</tr>
<tr>
<td>C</td>
<td>60 to 69 marks</td>
</tr>
<tr>
<td>D</td>
<td>55 to 59 marks</td>
</tr>
<tr>
<td>E</td>
<td>50 to 54 marks</td>
</tr>
<tr>
<td>F</td>
<td>Less than 50 marks</td>
</tr>
<tr>
<td>I</td>
<td>Insufficient attendance</td>
</tr>
<tr>
<td>W</td>
<td>Withdrawn from the course</td>
</tr>
</tbody>
</table>

In order to pass a course the student has to score 24 marks out of 60 (end semester examination) and 50 marks out of 100 (total marks).

A student who earns a grade of S, A, B, C, D or E for a course is declared to have successfully completed that course and earned the credits for that course. Such a course cannot be repeated by the student.

A student who obtains letter grades I or W in a course must reregister for and repeat the course.

A student who obtains letter grade F in a course has to reappear for the examination in that course.

A student who obtains letter grade I or W or F in thesis phase-I must reregister in the next semester. Registration for thesis phase-II for such students can be done in the subsequent semesters.

The following grade points are associated with each letter grade for calculating the GPA and CGPA.

- S - 10
- A - 9
- B - 8
- C - 7
- D - 6
- E - 5
- F - 0

Courses with grades I and W are not considered for calculation of grade point average or cumulative grade point average. F grade will be considered for computing GPA and CGPA.

A student can apply for re-totalling of one or more of his/her examination answer papers within a week from the date of issue of grade sheet to the student on payment of the prescribed fee per paper. The application must be made to the controller of examinations with the recommendation of the Head of the department.

After results are declared, grade cards will be issued to the students. The grade card will contain the list of courses registered during the semester, the grades scored and the grade point average for the semester.

GPA is the sum of the products of the number of credits of a course with the grade point scored in that course, taken over all the courses for the semester, divided by the sum of the number of credits for all courses taken in that semester. CGPA is similarly calculated considering all the courses taken from the time of admission.

The results of the final semester will be withheld until the student obtains passing grades in all the courses of all the earlier semesters.
After successful completion of the programme, the degree will be awarded with the following classifications based on CGPA.

For First class with Distinction the student must earn a minimum of 65 credits within four semesters for full-time and six semesters for part-time from the time of admission, pass all the courses in the first attempt and obtain a CGPA of 8.25 or above.

For First class, the student must earn a minimum of 65 credits within two years and six months for full time and three years and six months for part time from the time of admission and obtain a CGPA of 6.75 or above.

For second class the student must earn a minimum of 65 credits within four years for full-time and six years for part-time from the time of admission.

**R14. RANKING OF CANDIDATES**

The candidates who are eligible to get the M.E. degree in First Class with distinction will be ranked on the basis of CGPA for all the courses of study from I to IV Semester for M.E. Full time and from I to VI Semester for M.E. Part-Time.

The candidates passing with First class and without failing in any subject from the time of admission will be ranked next to those with distinction on the basis of CGPA for all the courses of study from I to IV Semester for M.E. Full time and from I to VI Semester for M.E. Part-Time.

**R15. ELECTIVES**

Apart from the various elective courses offered in the curriculum of the branch of specialisation, a student can choose a maximum of two electives from any specialisation under the faculty during the entire period of study, with the approval of the Head of the Department and the Head of the Department offering the course.

**R16. TRANSITORY REGULATIONS**

If a candidate studying under the old regulations could not attend any of the courses in his/her programme, shall be permitted to attend equal number of courses, under the new regulation and will be examined in those courses. The choice of courses will be decided by the concerned Head of the Department. However he/she will be permitted to submit the thesis as per the old regulations. The results of such candidates will be passed as per old regulations.

The University shall have powers to revise or change or amend the regulations, the scheme of examinations, the courses of study and the syllabi from time to time.
# M.E. Degree Programme (Full time) in Computer Science & Engineering

(Two year Degree Programme)

Choice Based Credit System (CBCS)

Subjects of study and scheme of examinations

## FIRST SEMESTER

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>L</th>
<th>Thesis</th>
<th>P</th>
<th>Exam Duration in hours</th>
<th>Exam marks</th>
<th>Sess. Marks</th>
<th>Total Marks</th>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSEC101</td>
<td>Mathematical Structures of Computer Science</td>
<td>3</td>
<td>1</td>
<td>3</td>
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<td>40</td>
<td>100</td>
<td>3</td>
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<tr>
<td>CSEC102</td>
<td>Data Structures and Algorithms</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>60</td>
<td>40</td>
<td>100</td>
<td>3</td>
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<tr>
<td>CSEC103</td>
<td>Computer Network Engineering &amp; Management</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>3</td>
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<td>60</td>
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<td>100</td>
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<tr>
<td>CSEE105</td>
<td>Elective - I</td>
<td>2</td>
<td>2</td>
<td>3</td>
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<td>40</td>
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<tr>
<td>CSEE106</td>
<td>Elective - II</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>60</td>
<td>40</td>
<td>100</td>
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<td></td>
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<tr>
<td>CSEP107</td>
<td>Programming Lab[Data Structures &amp; Graphics using C++]</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>60</td>
<td>40</td>
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</table>

Total 16 4 7 420 280 700 20

## SECOND SEMESTER

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>L</th>
<th>Thesis</th>
<th>P</th>
<th>Exam Duration in hours</th>
<th>Exam marks</th>
<th>Sess. Marks</th>
<th>Total Marks</th>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSEC201</td>
<td>Advanced Database Technology</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>60</td>
<td>40</td>
<td>100</td>
<td>3</td>
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<tr>
<td>CSEC202</td>
<td>Operating System Design</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>60</td>
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<td>100</td>
<td>3</td>
</tr>
<tr>
<td>CSEC203</td>
<td>Software Engineering Methodologies</td>
<td>2</td>
<td>2</td>
<td>3</td>
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<tr>
<td>CSEC204</td>
<td>Elective - III</td>
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<tr>
<td>CSEE205</td>
<td>Elective - IV</td>
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<tr>
<td>CSEE206</td>
<td>Elective - V</td>
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<td>2</td>
<td>3</td>
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<td>40</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSEP207</td>
<td>Design Lab[Operating Systems &amp; DBMS]</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>60</td>
<td>40</td>
<td>100</td>
<td>2</td>
</tr>
</tbody>
</table>

Total 14 2 11 420 280 700 20
M.E. Degree Programme (Full time) in Computer Science & Engineering (Two year Degree Programme) Choice Based Credit System (CBCS) Subjects of study and scheme of examinations

### THIRD SEMESTER

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>L</th>
<th>Thesis</th>
<th>Exam Duration in hours</th>
<th>Exam Marks</th>
<th>Sess. Marks</th>
<th>Total Marks</th>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSEE301</td>
<td>Elective-VI</td>
<td>4</td>
<td>3</td>
<td>60</td>
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<td>100</td>
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</tr>
<tr>
<td>CSEE302</td>
<td>Elective-VII</td>
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<td>40</td>
<td>100</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CSET303</td>
<td>Thesis Phase-I &amp; Viva-voce</td>
<td>-</td>
<td>15</td>
<td></td>
<td>60</td>
<td>40</td>
<td>100</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>8</td>
<td>15</td>
<td></td>
<td>180</td>
<td>120</td>
<td>300</td>
<td>12</td>
</tr>
</tbody>
</table>

### FOURTH SEMESTER

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>L</th>
<th>Thesis</th>
<th>Exam Duration in hours</th>
<th>Exam Marks</th>
<th>Sess. Marks</th>
<th>Total Marks</th>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSET401</td>
<td>Thesis Phase-II &amp; Viva-voce</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>60</td>
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<td>100</td>
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<tr>
<td><strong>Total</strong></td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>60</td>
<td>40</td>
<td>100</td>
<td>13</td>
</tr>
</tbody>
</table>

**ELECTIVES**

- CSEE01. Knowledge Based Systems
- CSEE02. Computer Architecture
- CSEE03. Neural Networks and Fuzzy Systems
- CSEE04. Digital Imaging
- CSEE05. Object Oriented Systems Design
- CSEE06. Real Time Computing Systems
- CSEE07. Data Mining and Warehousing
- CSEE08. Mobile Computing
- CSEE09. VLSI Technology
- CSEE10. Electronic Commerce Technology
- CSEE11. Design and Analysis of Parallel Algorithms
- CSEE12. Advanced System Software
- CSEE13. Multimedia Systems
- CSEE14. Advanced Web Design
- CSEE15. Network Security
- CSEE16. Internet Programming and Tools
- CSEE17. Embedded Systems
- CSEE18. Software Project Management
- CSEE19. Embedded Controllers and Systems
CSEC101: MATHEMATICAL STRUCTURES OF COMPUTER SCIENCE


REFERENCES:

CSEC102: DATA STRUCTURES AND ALGORITHMS

INTRODUCTION


BASIC DATA STRUCTURES


SETS AND COMPUTER ALGORITHM


POLYNOMIALS AND MATRICES


MEMORY MANAGEMENT


REFERENCES:

CSEC103: COMPUTER NETWORK ENGINEERING AND MANAGEMENT

PROTOCOLS AND ARCHITECTURES


NETWORK ACCESS PROTOCOLS AND NETWORKING


TRANSPORT AND SESSION SERVICE PROTOCOLS


PRESENTATION / APPLICATION PROTOCOLS


NETWORK MANAGEMENT


REFERENCES:

CSEC104: COMPUTER GRAPHICS


Three dimensional concepts – Transformations – Viewing – Clipping – Hidden surface and hidden line elimination algorithms.


REFERENCES:


CSEP107: PROGRAMMING LAB [DATA STRUCTURES AND GRAPHICS USING C++]

Exercises will be from Data Structures and Algorithms and Computer Graphics using C++ language.
CSEC201: ADVANCED DATABASE TECHNOLOGY


Object oriented databases – Introduction – Approaches to object oriented databases – Modeling and design for object oriented databases – Persistence – Transaction, concurrency, recovery and versioning in Object oriented databases.


REFERENCES:

CSEC202: OPERATING SYSTEM DESIGN


REFERENCES:


CSEC203: SOFTWARE ENGINEERING METHODOLOGIES


QUALITY CONSIDERATIONS AND STANDARDS


QUALITY ASSURANCE

Software Quality and Software quality assurance – Software reviews – Software quality metrics – Formal approaches to Software quality assurance – Software reliability.

REFERENCES:

CSEP207: DESIGN LAB [OPERATING SYSTEM & DBMS]

Exercises will be from Operating System Design and DataBase Management System.
ELECTIVES

CSEE01: KNOWLEDGE BASED SYSTEMS


Applications: Information retrieval - E-Commerce -Telecommunication systems.

REFERENCES
4. Ellain Ritche, “Artificial Intelligence”, TMH

Reference Links
http://www.ouhk.edu.hk/~operlink/current/0004/e-com.htm
http://ai.bpa.arizona.edu/papers/mlir93/mlir93.html

Note: No prescribed book for the last unit. Materials are available in the net. Some of the relevant links are given above.
CSEE02: COMPUTER ARCHITECTURE

Introduction – Measuring & reporting Performance – Quantitative principles of computer design - Memory Hierarchy design – Cache, cache performance, reducing cache misses, reducing cache miss penalty, reducing hit time, Main memory, Virtual memory - Storage systems – Types, Buses, I/O performance measures - Designing an I/O system – Computer arithmetic – Basic Techniques of Integer arithmetic, Floating point arithmetic – Speeding up Integer arithmetic.

Instruction set principles – Classifying instruction set architectures, Memory addressing, Operations, Encoding an Instruction set, Role of compilers - DLX architecture – Pipelining – Basic pipeline for DLX, Pipeline Hazards, Data Hazards, Control hazards, Structured hazards, What makes pipelining hard to implement.


RISC –Addressing modes of Instruction formats, MIPS, Power PC, RISC Vs CISC – Control Unit Operation – Micro operation, Micro programmed control – Microinstruction sequencing, TI8800, Applications of Microprogramming.

REFERENCES
CSEE03 : NEURAL NETWORKS AND FUZZY SYSTEMS

**Back Propagation**


**Statistical Methods**


**Counter Propagation Network & Adaptive Resonance Theory**


**Neo-Cognitron**


**Fuzzy Sets**


**REFERENCES**

Digital Image Fundamentals


Image Enhancement


Image Compression & Segmentation


Feature Extraction

Image feature description – Interpretation of Line drawings, Image pattern recognition algorithms.

Knowledge Representation And Use

Knowledge representations and use – Image analysis using knowledge about scenes – Image understanding using two dimensional methods.

REFERENCES
CSEE05: OBJECT ORIENTED SYSTEMS DESIGN


REFERENCES


CSEE06: REAL TIME COMPUTING SYSTEMS

Introduction to Real-Time Systems (RTS): Typical examples of real-time systems – Characteristic features of real-time structural, functional and performance requirements of reactive real-time system – distinctive features from non-real-time and off-line systems.

Modelling RTS: Representation of time – concurrency and distributed ness in discrete event systems – examples of Modelling practical systems.

Analysis of RTS: Analyzing logical properties of discrete event systems – analyzing timing related properties. Examples of checking safety and timing properties of industrial systems.


REFERENCES
CSEE07 : DATA MINING AND WAREHOUSING

Introduction
Relation to statistics, databases, machine learning – Taxonomy of data mining tasks – Steps in data mining process – Overview of data mining techniques.

Visualization and Statistical Perspectives

Predictive Modelling

Data Warehousing

Applications
Tools – Applications – Case studies.

REFERENCES
CSEE08 : MOBILE COMPUTING

Introduction
Medium access control – Telecommunication systems – Satellite systems – Broadcast systems.

Standards
Wireless LAN – IEEE 802.11 – HIPERLAN – Blue Tooth.

Adhoc Networks
Characteristics – Performance issues – Routing in mobile hosts.

Network Issues

Application Issues

REFERENCES
CSEE09. VLSI TECHNOLOGY

MOS Technology and Circuit Design


Digital Circuits and Analog VLSI

Programmable Logic Array(PLA) and Finite State Machines – Design of ALUs – Memories and Registers – Introduction to Analog VLSI – Realization of Neural Networks and Switched capacitor filters – Sub-micron technology and GaAs VLSI technology.

Crystal Growth, Wafer Preparation, Epitaxy & Oxidation


Lithography and Relative Plasma Etching


Deposition, Diffusion, Ion Implantation and Metalisation


REFERENCES

CSEE10 : ELECTRONIC COMMERCE TECHNOLOGY

Introduction


Core Technology


Electronic Payment Systems


Security


Inter/Intra Organizational Electronic Commerce


REFERENCES

CSEE11: DESIGN AND ANALYSIS OF PARALLEL ALGORITHMS


REFERENCES
Introduction

Introduction to System Software – Assemblers – Features and Functions – Loaders – Features and Functions – Macro processors – Features and Functions.

Compilers


Syntax Analyzer

Role of a parser – Context-free grammars – Top-down parsing – Bottom-up parsing – Use of a tool to generate parsers.

Intermediate Code Generation


Code Generation


REFERENCES

CSEE13: MULTIMEDIA SYSTEMS

**Introduction**


**Compression And File Formats**


**Input/Output Technologies**

Traditional devices – Pen input – Video display systems – Scanners – Digital audio – Video images and animation.

**Storage and Retrieval**


**Application Design**


**REFERENCES**

CSEE14: ADVANCED WEB DESIGN

Fundamentals

Simple Design Issues

Advance Design Issued

Scripting in Design

Tools and Applications
Online applications – Developing as on-line shopping application – Data Base design issues – connecting Data Base with tools such as Java, ASP, Cold Fusion – Designing Portals and Vortals.

REFERENCES
CSEE15: NETWORK SECURITY

Security Problem
Security problem in computing - Characteristics of computers in intrusion - Kinds of security breaches - Points of security vulnerability - Methods of defence - Controls - Effectiveness of controls - Plan of attack encryption.

Cryptography
Basic encryption and decryption - Mono alphabetic ciphers – poly alphabetic substitution, transpositions - Fractional Morse - Stream and block ciphers - Characteristics of good ciphers - Secure encryption systems - Public key systems - Single Key system - Data encryption standard - Rivest Shamir Adelman (RSA) encryption.

Role of Operating System
Security involving programs and Operating Systems - Information access problems - Program development controls - Operating system controls in use of programs administration controls - Protection services for users of operating system - Protected objects and method of protection - File protection mechanism - User authentication.

Database and Network Security
Database and Network security - Security requirements for database - Reliability and integrity - Sensitive data - Inference problem - Multilevel databases.


Communication and System Security
Communication and system security - Communication characteristics - Communication media - Loss of integrity - Wire tapping - Electronic mail security - IP security - WEB security - Intruders, Viruses, Worms-Firewalls-Standards.

REFERENCES
CSEE16: INTERNET PROGRAMMING AND TOOLS

Basic Internet Concepts

Internet Applications
Electronic Mail, Newsgroups, UUCP, FTP, Telnet, Finger, etc.

World Wide Web
Overview – Hyper Text Mark up Language – Uniform Resource Locators – HTTP Protocol – Common Gateway Interface – Multipurpose Internet Mail Extension – Web Browsers such as Netscape, Internet Explorer.

Java Programming Language

Miscellaneous Topics
Intranets – Internet Commerce – Internet and VRML – Active X.

REFERENCES
CSEE17: EMBEDDED SYSTEMS


Transducers: Sensors for measuring physical phenomena – output devices such as power actuators - motors. Data transformation – signal conditioning - data conversion. The impact of EMC regulations on design practice.

TEXT BOOK

REFERENCE BOOK
CSEE18: SOFTWARE PROJECT MANAGEMENT


Project Schedule Planning: Top-Down and Bottom-up planning - Initial and final project schedule plans - Types of Activity Relationships - Estimating the duration of an Activity - critical path - Identifying milestones - Activity responsibility matrix - project check list.

Project Tracking: Overview of project progress - project outlook - occurrence of tracking - tracking meetings - Tracking Meeting ground rules - Recovery plans - the role of Escalations.

Product Requirement and Specifications: product Requirements - understanding the customer’s problem to solve - product objectives - providing direction for the solution - product specifications - Defining the Final product - Development testing - Unit test - function test - function test plan - Anticipating qualities weak link.


REFERENCE BOOKS


INTRODUCTION:
Overview of dedicated and automated systems and their applications—Their specific requirements—Temporal and Technological constraints—software embedded in to a system-embedded systems on a chip (SOC) and the use of VLSI designed circuits—choice of a processor—product design cycle.

SOFTWARE ISSUES AND DEVELOPMENT:
Development environment compilers—linker/locator—getting embedded software in to the target system—emulation and debugging techniques—Real Time Operating systems—kernel—concepts of programming in assembly language (Vs) high level language—creating software state machines—designing and implementing code for dedicated systems.

HARDWARE ISSUES:
I/O devices—CAN bus and advanced I/O serial high speed buses—memory—speed—integration—embedded DSP devices—overview of embedded microcontrollers—introduction to FPGA—case study of a embedded system for a smart card and burglar alarm.

TRANSUDCERS:
Sensors for measuring physical phenomena—output devices such as power actuators—motors—data transformation—signal conditioning—data conversion—the impact of EMC regulations on design practice.

INTERFACING:
Parallel port interfaces—input switches and keyboards, output LED—Memory interfacing—address decoding, general memory bus timing, external bus timing—general approach for high speed interfacing and analog interfacing—need for speed.

REFERENCES: