Maharshi Dayanand University
Rohtak

Syllabus and Courses of Reading for
M.Tech (Electronics & Communication Engg.)
Examination

Session 2011-2012

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### MASTER OF TECHNOLOGY COURSE IN ELECTRONICS & COMMUNICATION ENGG. SEMESTER-I

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**Elective-I**
- Advanced Digital Communication Techniques (MEEC-509)
- Advanced Mathematics for Engineers (MEEC-511)
- Computational methods (MEEC-513)
- Data Communication Networks (MEEC-515)

**Note:**
1. The paper setters shall set each theory paper of 100 marks covering the entire syllabus. However, the examiner shall evaluate the performance of the student in the theory paper finally by assigning one of the grades out of A+, A, B, C, D and E. The Examination of practical courses shall also be evaluated on the basis of three grades.
2. The Sessionals of Theory/Practical Courses shall also be evaluated on the basis of these grades.
3. The choice of students for any elective shall not be binding on the Deptt. to offer it.
4. The Grading System is defined at the end of the Scheme of Studies & Examinations.

### MASTER OF TECHNOLOGY COURSE IN ELECTRONICS & COMMUNICATION ENGG. SEMESTER-II

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**Elective-II**
- Switching Systems (MEEC-512)
- Multimedia Systems (MEEC-514)
- Statistical Models (MEEC-516)

**Note:**
1. The paper setters shall set each theory paper of 100 marks covering the entire syllabus. However, the examiner shall evaluate the performance of the student in the theory paper finally by assigning one of the grades out of A+, A, B, C, D and E. The Examination of practical courses shall also be evaluated on the basis of three grades.
2. The Sessionals of Theory/Practical Courses shall also be evaluated on the basis of these grades.
3. The choice of students for any elective shall not be binding on the Deptt. to offer it.
4. The Grading System is defined at the end of the Scheme of Studies & Examinations.
### Semester III

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### Elective-III

- Reliability Engineering (MEEC-619)
- Emerging Networks Technologies (MEEC-605)
- Digital Signal Processors & Applications (MEEC-607)
- Image Processing (MEEC-609)
- Computer Communications (MEEC-611)

Note:
1. The paper setters shall set each theory paper of 100 marks covering the entire syllabus. However, the examiner shall evaluate the performance of the student in the theory paper finally by assigning one of the grades out of A+, A, B, C, D & E. The Examination of practical courses shall also be evaluated on the basis of three grades.
2. The Sessionals of Theory/Practical Courses shall also be evaluated on the basis of the grades.
3. The choice of students for any elective shall not be binding on the Department to offer it.
4. The Grading System is defined at the end of the Scheme of Studies & Examinations.

### Semester IV

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Note:
1. Sessionals of Dissertation Course shall be evaluated on the basis of the grades out of A+, A, B, C, D & E.
2. The dissertation shall be evaluated through an exam. by a Committee of Examiners consisting of Head of the Department, Dissertation supervisor & one External Examiner. The evaluation shall be based upon the above grades.
3. The Grading System is defined at the end of the Scheme of Studies & Examinations.
MEEC-501      ADVANCED MICROPROCESSOR & MICROCONTROLLERS

L   T   P       Marks  Credits
4   -   -       Exams  :  100   4
4     -   -    Sessionals :  50   2
Total :  150   6
Duration of Exam : 3 hrs.

1. **Design of basic microprocessor architectural Concepts**:
   Microprocessor architecture, word lengths, addressable memory, Microprocessor’s speed architectural characteristics, registers, instruction, memory addressing architecture, ALU, GPR’s Control logic & internal data bus.

2. **Microprocessor Instructions & Communication**:
   Instruction Set, Mnemonics, Basic Instruction Types, Addressing modes, Microprocessor I/O connecting I/O put to Microprocessor, Polling and Interrupts, Interrupt and DM. Controllers.

3. **Microcontroller**:
   Introduction 8051 architecture and programming model. Internal RAM and registers, I/O parts, Interrupt system & Instruction sets.

4. **Advanced microprocessors**:
   Intel X86 family of advanced Microprocessor, programming model for 86 family. X85 addressing modes, instruction set, hardware. Motorola 68 XXX family of microprocessor, 68 XXX addressing modes, instruction set, hardware.

5. **Microprocessor I/O**:

6. **Developing Microprocessor Based Products**:
   Introduction to the Design Process, Preparing the specifications, Developing a design, Implementing and Testing and design, Regulatory Compliance Testing, design tool for Microprocessor Development.

Text Books:
1. C.M. Gilmore, “Microprocessors Principals and Application”, MGH

Reference Books:
1. Berry B. Berry, “Inter Series of microprocessors”, PHI
2. D. V. Hall, “Microprocessor & Interfacing”, TMH

NOTE:
1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.
3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-503      SATELLITE AND SPACE COMMUNICATION

L   T   P       Marks  Credits
4   -   -       Exams  :  100   4
4     -   -    Sessionals :  50   2
Total :  150   6
Duration of Exam : 3 hrs.

1. **Introduction**:
   Satellite communication, Brief History.

2. **Orbits of satellite**:
   Low, medium and Geo synchronous main characteristics, Angle period, Returning period, Angle of Evaluation, Propagation Delay, Orbital Spacing.
3. **Satellite Links**: Delay transponders, Earth Stations, Antennas and Earth coverage, Altitude and eclipses.

4. **Earth space propagation effects**: Frequency window, Free space loss, Atmospheric absorption, Rainfall Attenuation, Ionospheric scintillation, Telemetry, Tracking and command of satellites.

5. **Detection**: QPSK offset QPSK and MSK. Coherent and non-coherent detection, Error rate performance.

6. **Synchronization**: Principle and techniques, Multiple Access Techniques, FDMA, SPADE system, TDMA system, concept and configuration, system timing frames format, SSMA-Basu Principles, VSAT, Random access, space communication, link design description of operational in TELSAT and INSA T system.

**Text Books:**


**Reference Books:**

1. Tri Ha Digital Satellite Communication Tata Mc Graw Hill.

**NOTE:**

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2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.

3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.
2. Ranjan Bose, Information Theory, Coding & Cryptography, TMH


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MEEC-507 ADVANCED DIGITAL SIGNAL PROCESSING

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2. **Fourier Transform & inverse Fourier transform**: Frequency domain design of digital filters, Fourier transform, use of Fourier transform in Signal processing. The inverse fourier transform, Sampling continuous function to generate a sequence, Reconstruction of continuous -time signals from Discrete-time sequences.

3. **DFT & FFT & Z transform with Applications**: Discrete Fourier transform, properties of DFT, Circular Convolution, Fast Fourier Transform, Realizations of DFT. The Z-transform, the system function of a digital filter, Digital Filter implementation from the system function, the inverse Z- transform, properties & applications, Special computation of finite sequences, sequence of infinite length & continuous time signals, computation of fourier series & time sequences from spectra.

4. **Digital Filter Structure & Implementation**: Linearity, time-invariance & causality, the discrete convolution, the transfer function, stability tests, steady state response, Amplitude & Phase characteristics, stabilization procedure, Ideal LP Filter, Physical reliability & specifications. FIR Filters, Truncation windowing & Delays, design example, IIR Filters: Review of design of analog filters & analog frequency transformation. Digital frequency transformation. Design of LP filters using impulse invariance method, Bilinear transformation, Phase equalizer, digital all pass filters.

5. **Implementation of Filters**: Realization block diagrams, Cascade & parallel realization, effect of infinite-word length, transfer function of degree 1&2, Sensitivity comparisons, effects of finite precision arithmetic on Digital filters.

**Text Books**


**Reference Books**


NOTE:

1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.

2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.

3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-509 ADVANCED DIGITAL COMMUNICATION TECHNIQUES

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Exams : 100 4
Sessionals : 50 2
Total : 150 6
Duration of Exam : 3 hrs.

1. Vector quantization, sub band coding of speech, audio and video signals, linear predictive coding of speech, CELP coders, and MPEG standards for audio and video.

2. Characterization of band pass signals, and systems, orthonormal expansion of signals, representation of digitally modulated signals, non-linear modulation methods, with memory. Optimum demodulation for known signals in additive Gaussian noise.

3. Probability of error for binary and Mary signaling, DPSK demodulator, carrier and symbol synchronization techniques, characterization of band limited channels and ISI, signal design for zero ISI, and controlled ISI, optimum demodulator, for ISI and AWGN.

4. Linear equalization and decision feedback, equalization, adaptive equalize, fading dispersion channels, and tapped delay line model optimum demodulation for binary signals over fading dispersive channels, RAKE recover.

Text Books:


Reference Books:


NOTE:

1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.

2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.

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MEEC-511 ADVANCED MATHEMATICS FOR ENGINEERS

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Exams : 100 4
Sessionals : 50 2
Total : 150 6
Duration of Exam : 3 hrs.

Transforms, Parseval’s Identity, Fourier Transforms of derivative of functions, Relation between Fourier and Laplace transform.


Text Book:
1. Dr. B.S. Grewal; “Higher Engineering Mathematics”, Khanna Publishers

Reference Books:

NOTE :
1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.
3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-513 COMPUTATIONAL METHODS

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Duration of Exam : 3 hrs.

1. Computational complexity, Error analysis in science and engineering, Fourier series, Fourier Integral, example of transforms’ and orthogonal polynomials, Time series calculation of power spectra, convolution and correlation using FETs, introduction to wavelets.

2. Evaluation of integrals, Elementary Analytical methods, Trapezoidal and Simpson’s rules, Summation of series, Gaussian Quadrature and orthogonal 1 polynomials, Multidimensional integrals.

4. Vectors and matrices, solution of linear and algebraic equations by direct and interactive methods, Gaussian elimination, minimal residual and conjugate gradient methods, preconditioning techniques.

Text Books:
2. Dr. B.S. Grewal, “Numerical Methods in Engg. & science”, Khanna Publisher

Reference Books:
3. J.B. Scarborough, Numerical Mathematical Analysis, oxford

NOTE:
1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.
3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-515 DATA COMMUNICATION NETWORKS

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1. Introduction to Data Transmission: Overview of Data Communication and networking, Analog And Digital Data Transmission, Transmission Impairments, Various Transmission Media, Data Encoding.
2. Digital Data Communication Techniques: Asynchronous And Synchronous Transmission, Error Detection and correction techniques, Physical interfaces
3. Data Link Control: Link Configurations, Protocol principles (Error control, Flow control), Bit Oriented and character oriented protocol, Data link layer services, Link Control.
4. Multiplexing: F.D.M. Synchronous TDM, Statistical TDM
7. ISDN Networks: Concepts & Architecture, Protocols

Text Books:
2. Forouzan, "Data communications and networking", TMH

Reference Books:
1. Andrew Tanenbaum, “Computer Networking”, PHI
2. Godbole, “Data communications and network”, TMH

NOTE:
1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.

2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.

3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-517 SATELLITE LAB

L T P Marks Credits
- - 3 Exams : 50 2
  Sessionals : 50 2
  Total : 100 4
  Duration of Exam : 3 hrs.

(A few experiments may be designed & included in this list depending upon the infrastructure available in the institute)

1. To Study the process of Transmitting Signal.
2. To Study the Base band Signal in a Satellite Link.
3. To estimate C/N Ratio.
4. To estimate S/N Ratio.
5. To setup digital satellite Communication Link.

MEEC-519 ADVANCED MICROPROCESSOR & MICROCONTROLLER LAB

L T P Marks Credits
- - 3 Exams : 50 2
  Sessionals : 50 2
  Total : 100 4
  Duration of Exam : 3 hrs.

(A few experiments may be designed & included in this list depending upon the infrastructure available in the institute)

1. To study the architecture of 8086 Kit
2. Write an ALP to convert a hexadecimal No. to decimal No. in single step execution (DEBUG)
3. Write an ALP to enter a word from keyboard and to display
4. Write an ALP for addition of two one digit Numbers.
5. Write an ALP to display a string
6. Write an ALP reverse a string
7. Write an ALP to check whether the No. is Palindrome
8. To study the Microcontroller Kit
9. Write an ALP to generate 10 KHz frequency square wave
10. Write an ALP to generate 10 KHz & 100KHz frequency using interrupt
11. Write an ALP to interface intelligent LCD display
12. Write an ALP to interface intelligent LED display
13. Write an ALP to Switch ON alarm when Microcontroller receive interrupt
14. Write an ALP to interface one microcontroller with other using serial / parallel communication.

**NOTE:** The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner.

### MEEC-502 ELECTRONICS SYSTEM DESIGN

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1. **Review of Digital Electronics concept**
5. **Asynchronous Finite State Machines:** Scope, Asynchronous Analysis, Design Of Asynchronous Machines, Cycle And Races, Plotting And Reading The Excitation Map, Hazards, Essential Hazards Map Entered Variable, MEV Approaches To Asynchronous Design, Hazards In Circuit Developed By MEV Method.

Text Books:
2. Z. Kohavi, “Switching and Finite Automata Theory”, TMH

**Reference Books**
1. Markovitz, “Introduction to Logic Design”, TMH

**NOTE:** In the semester exam., the examiner will set 8 questions
in all covering the entire syllabus. Students will be required to attempt any five questions.

2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.

3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-504  OPTICAL COMMUNICATION

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5. Optical fiber communication System: Optical transmitter circuit : LED and laser drive circuits, optical receiver circuit; Structure, Pre amplifier, AGC, Equalization, Optical power budgeting line loading, analog systems: analog modulation, direct modulation, sub carrier modulation, distribution system, Optical TDM sub-carrier multiplexing, WDM.


Text books:

Reference Books:

NOTE: 1 In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.

2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.

3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.
MEEC-506 VLSI DESIGN

L T P Marks Credits
4 - - Exams : 100 4
  Sessionals : 50 2
  Total : 150 6
  Duration of Exam : 3 hrs.

1. Review of MOS technology: Basic MOS Transistors, Enhancement and Depletion mode transistors, N MOS and C MOS process, thermal aspects of processing, Production of masks.

2. Electrical properties of MOS circuit: Parameters of MOS transistors, pass transistors, N MOS inverter, Pull-up to pull down ratio for an N MOS inverter, C MOS inverters, MOS transistor circuit model, Latch up on C MOS circuits.


5. Subsystem Design & Layout: Architectural issues in VLSI, switch logic, gate logic, Examples of Combinational logic, Clocked sequential circuits, other system consideration.


7. Design Examples: Design of an ALU subsystems, carry look ahead address, parallel.

Text Books:

Reference Books:
2. SZE, “VLSI Technology”, TMH

NOTE:
1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.
3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-508 WIRELESS MOBILE COMMUNICATION

L T P Marks Credits
4 - - Exams : 100 4
  Sessionals : 50 2
  Total : 150 6
  Duration of Exam : 3 hrs.

1. Introduction to mobile radio systems: Paging systems, cordless telephone system, Cellular telephone systems- Cellular concept, frequency reuse, channel assignment strategies, Interference and system capacity, trunking and grade of service, cell splitting, sectoring, microcell zone concept, HO strategies.

2. Mobile radio propagation: mechanism, free space path loss, log-distance path loss models, Okumara model, Hata model, PCS model, Wideband PCS microcell model, indoor propagation models, Jake’s channel model, Multi path characteristics of radio waves, signal fading, Time dispersion, Doppler spread, coherence time LCR, fading statistics, diversity techniques.
3. Introduction to spread spectrum communication, multiple access techniques used in mobile wireless communication: FDMA/TDMA/CDMA, Cellular CDMA, packet radio protocols, CSMA, reservation protocols, capacity of cellular CDMA, soft HO

4. Wireless systems and standards: GSM standards, signaling and call control, mobility management, location tracing, wireless data networking, packet error modeling on fading channels, Performance analysis of link and transport layer protocols over wireless channels, mobile data networking (mobile IP), wireless data services, IS-95, GPRS

Text Books:

Reference Books:

NOTE: 1 In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.
3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.
NOTE :
1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.

2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.

3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-514  MULTIMEDIA SYSTEMS

L    T    P    Marks    Credits
4    -    -  Exams  : 100    4
      -    -  Sessionals  : 50    2
      -    -  Total  : 150    6

Duration of Exam  : 3 hrs.


2. Digital audio representation and processing: Audio in computer applications, its digital representation, transmission and digital processing, speech recognition and generation.

3. Digital video and image compression: Video compression techniques and standardization of algorithms, JPEG, MPEG, DVI technology.


5. Multimedia communication systems: Public Network services and N/W Protocols, Quick time Movie File (QMF), format, OMFI, MHEG, Format function Real time Interchange, Track Model and Object Model Teleconferencing systems, Shared Amlication Architectures, Embedded Distributed objects, Multimedia conferencing architecture, architecture of team workstation.


Text Books:

Reference Books:
1. Fred Halsall, “Multimedia Communications”, Pearson

NOTE :
1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.

2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.
3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-516 STATISTICAL MODELS

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Random Variables and distribution function. Probability mass and probability density function, Two dimensional random variables: joint, Marginal and conditional distributions, Independence of random variables. Moments, Expectation, Variance covariance, conditional expectation.

Probability generating and Moment generating functions, Characteristics function.

Probability distributions; Binomial, Poisson, Geometric, Negative Binomial, Uniform, Exponential, Beta, Gamma, Weibull and Normal

General / Stochastic Process, definition, classification and examples, compound distribution, Random walk Gambler’s ruin problem.

Markov chains, higher transition probabilities. Classification of states and chain, determination of higher transition probabilities, Stability of Markov systems, limiting behaviour.


Queueing systems, general concepts, Queueing models /M/M/1, M/M/1/R, M/M/C, M/M/ ,M/M/C/C, M/E k models. Machine interference problem.

TEXT BOOK:

Reference Books:
1. Medhi, J, New International publication
2. Bhatt B.R., Stochastic models

NOTE:
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3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-518 VLSI LAB

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A few experiments may be designed & included in this list depending upon the infrastructure available in the institute)
1. Write a spice programme for CMOS inverter with following details.
2. Write a spice programme for CMOS nand gate with following details:
   Vdd=5 volt, pmos L=8 um W=20um, nmos L =8um W=um, 
   nmos (kp=45u V to = 1.0v) pmos (kp=25u Vto=-1.2v)

3. Write a spice programme for CMOS nor gates with following details:
   Vdd=5volt, pmos L=8um W=20um, nmos L=8um W=um, 
   nmos (kp=45u Vto=1.0v) Pmos (kp=25u Vto=-1.2v)

4. Design a d-latch with clk time period=6ns using nand gates with following specification:
   L=2U W=100U for n&p-mos, For n-mos Kn'=600 Vto = 0.6V)
   for p-mos kp=20U Vto=0.8v)

5. Design a half adder using nand gates with following specifications:
   for n-mos : L=20 W=100U, for p-mos L=2U W=650U, for n-mos Kn'=600 Vto=0.6V)
   for P-mos Kp=20U Vto=0.8v)

6. Design a full adder using half adder designed above.

7. Design the layout for PMOS in layout editor.

8. Design the layout for NMOS in layout editor.

9. Design the layout for CMOS inverter with equal rise and fall time in layout editor.

10. Design the layout for 2-Input NAND gate.

11. Design the layout for 2-Input NOR gate.

12. Design the layout for clocked S-R flip-flop.

Note: The Scheme of awarding the grades to a student in the course will be supplied by the University to examiner.
MEEC-601  NEURAL NETWORKS & FUZZY LOGIC

L  T  P                      Marks  Credits
4  -  -                      Exams : 100  4
                                            Sessionals : 50  2
                                            Total : 150  6
                                            Duration of Exam : 3 hrs.


4. Applications of neural nets: Applications such as pattern recognition, Pattern mapping, Associative memories, speech and decision-making..


Text Books:
1. B. Yegnanarayana, “Artificial Neural Networks” PHI

3. ROSS J.T , “Fuzzy logic with engineering application”, TMH

Reference Books:
1. Simon Haykin, “Neural Networks”, PHI
2. Ahmad M.Ibrahim, “Introduction to applied Fuzzy Electronics”, (PHI)

NOTE:
1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.

2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.

3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-603  CDMA SYSTEMS

L  T  P                      Marks  Credits
4  -  -                      Exams : 100  4
                                            Sessionals : 50  2
                                            Total : 150  6
                                            Duration of Exam : 3 hrs.

1: Direct sequence and frequency hopped spread spectrum, spreading sequence and their correlation functions, Acquisition and tracking of spread spectrum signals.

2: Error probability for DS-CDMA, on AWGN channels, DS-CDMA on frequency selective fading, channels, Performance analysis of cellular CDMA.
3: Capacity estimation, Power control, effect of imperfect power control on DS CDMA performance, Soft Handoffs.

4: Spreading /coding tradeoffs, multi-carrier CDMA, IS-95 CDMA system, third generation CDMA systems, multi-user detection.

Text Books:

Reference Books:
2. Steve Lee, “Spread spectrum CDMA”, TMH

NOTE:
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2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.
3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-605 EMERGING NETWORK TECHNOLOGIES

L T P Marks Credits
4 - - Exams : 100 4
Sessionals : 50 2
Total : 150 6
Duration of Exam : 3 hrs.

1. Foundations: virtual circuits, PVC, SVC, SPVC, connection oriented and connectionless systems, variable bit rate and constant bit rate applications, flow control and connection management, addressing and identification schemes, multiplexing methodologies, network interface.

2. System & topology: TI/IE I CARRIER systems, topology, X.25, layers, POUs, ISDN- typical topology, layers, and PDUs, SS7, FOOI, Frame relay, standards, topology, layers, OSI and ANSI layers. frame relay protocol data unit Frame relay network to network interface.

3. Fast and switched Ethernet: generation of LANs, switched Ethernet, architecture, store and forward and Cut through switches, virtual LAN, Fast Ethernet, 100BASET.


Text Books:
Reference Books:


NOTE:

1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.

2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.

3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-607 DIGITAL SIGNAL PROCESSORS AND APPLICATIONS

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1. SDP 56002: Architecture, CPU, ALU, Program Controller, Address Generation Unit, Addressing Modes, Interrupt, Priority register.

2. DSP 56002 Instruction Set: Instruction Formats Parallel move operating parallel move types, instructions set, move arithmetic logic, bit manipulation, loop, programmed control instructions.


4. TMS - 320 Architecture, and Instruction Set.

TEXT BOOK:

1. Mohammed EL. Sharkawy: Digital Signal Processor Applications with Motorola’s DSP 56002. PTR.


NOTE:

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3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-609 IMAGE PROCESSING

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4. **Image Enhancement**: Spatial and frequency domain methods point processing, intensity transformation, Histogram processing image substitution and Averaging spatial filtering, LP, HP and homomorphic felling, generation of spatial marks, Color image processing.

5. **Image Restoration**: Degradation model, digitalization of circulate and block circulate metrics, Algebraic approved invoice filtering, wiener filter, constrained least square restoration, Interactive restoration in spatial domain geometric transformation.


7. **Image Segmentation**: Detection of Discontinuity, Edge detection, Boundary detection, Thresholding, Regional oriented segmentation use of motion in segmentation.

8. **Representation and Description**: Image analysis, Pattern and their classes, Decision theoretical methods, Structural methods, Interpretation.

**Text Books:**


**Reference Books:**


**NOTE:**

1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.

2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.

3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

**MEEC-611 COMPUTER COMMUNICATIONS**

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**Sessionals**: 50 2

**Total**: 150 6

**Duration of Exam**: 3 hrs.

1. **Data communication**: Introduction to data communication. Concept of analog and digital signals. Bandwidth. Transmission media. Wired and wireless connectivity. FDM, TDM and CDMA. Circuit and packet switching. Frame relay and ATM switching. ISDN.


5. **Transport and application layer**: Transport and application layer design issues. Connection management. Transport protocol
on top of X.25. File transfer and access management.


Text Books
1. Stallings, “Data communication & Networking”, PHI
2. Tanenbaum, “Computer Networks”, PHI

References Books:
2. Forouzan, “Data communications and networking”, TMH
3. Godbole, “Data communications and network”, TMH

NOTE:
1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.
3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-619 RELIABILITY ENGINEERING

L T P Marks Credits
4 - - Exams : 100 4
- - Sessionals : 50 2
- - Total : 150 6

Duration of Exam : 3 hrs.


3. Reliability Prediction: Objective of reliability Prediction, Classification, Information sources for failure rate data, prediction methodologies, general requirement, role and limitations of reliability prediction.

4. Reliability Allocation: Subsystems reliability improvement, Apportionment for new units, critically.

5. Redundancy Techniques for reliability: Forms of maintenance, measures of maintainability and availability, maintainability function, availability function, two unit parallel system with repair, Markov model for two unit systems, preventive maintenance provisioning of spares.

6. Reliability Testing: Kinds of testing, components reliability measurements parametric methods, confidence limits, accelerate testing, equipment acceptance testing.

7. Economics of Reliability Engineering: Reliability cost, effect of reliability on cost, reliability achievement cost models, replacement policies.
8. Integrated performance measures for communication system:
Integration of reliability and capacity, Delay related reliability.

Text Books:
3. Balaguruswamy : Reliability Engineering

Reference Books:
2. Ebeling, "Introduction to Reliability & Maintainability", TMH

NOTE:
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2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.
3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

MEEC-613 SEMINAR

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Every student will be required to present a seminar talk on a topic approved by the Deptt. except on his/her dissertation. The committee constituted by the Head of the Deptt. will evaluate the presentation and will award one of the grades out of A+, A, B, C, D and E.

A Student who is awarded the ‘F’ grade will be required to repeat the seminar on the same topic.

MEEC-617 DISSERTATION (PHASE-I)

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Every student will carry out dissertation under the supervision of a Supervisor(s). The topic shall be approved by a Committee constituted by the Head of the concerned Deptt.

Every student will be required to present two seminar talks, first at the beginning of the Dissertation (Phase-I) to present the scope of the work and to finalize the topic, and second towards the end of the semester, presenting the work carried out by him/her in the semester. The committee constituted will screen both the presentations so as to award the sessional grades out of A+, A, B, C, D and E. A student scoring ‘F’ grade shall have to improve this grade before continuing his/her Dissertation in the 4th semester failing which he/she shall have to repeat the Dissertation (Phase-I) next time in the regular 3rd semester.
The Dissertation Phase-1 will be continued as dissertation in 4th Semester. The award of sessional grades out of A+, A, B, C, D and E will be done by an internal Committee constituted by the Head of the Deptt. This assessment shall be based on presentation(s), report, etc. before this committee. In case a student scores ‘F’ grade in the sessional, failing which he/she will not be allowed to submit the dissertation.

At the end of the semester, every student will be required to submit three bound copies of his/her Master’s dissertation of the office of the concerned Department. Out of these, one copy will be kept for department record & one copy shall be for the supervisor. A copy of the dissertation will be sent to the external examiner by mail by the concerned department, after his/her appointment and intimation from the university. Dissertation will be evaluated by a committee of examiners consisting of the Head of the Department, dissertation supervisor(s) and one external examiner. There shall be no requirement of a separate evaluation report on the Master Dissertation from the external examiner.

The external examiner shall be appointed by the University from a panel of examiners submitted by the respective Head of Deptt., to the Chairman, Board of Studies. In case the external examiner so appointed by the University does not turn up, the Director/Principal of the concerned college, on the recommendation of the concerned Head of the Dept. Shall be authorized, on behalf of the University, to appointed an external examiner from some other institution.

The student will defend his/her dissertation through presentation before this committee and the committee will award one of the grades out of A+, A, B, C, D and E. Student scoring ‘F’ grade in the exam shall have to resubmit his/her Dissertation after making all correction/improvements and this dissertation shall be evaluated as above.

Note: The Scheme of awarding the Grades to the student in the course will be supplied by the University to the examiner(s).