SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited with "A" Grade by NAAC
Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai - 600 119.
Phone: 044 - 2450 3150 / 51 / 52 / 54 / 55 Fax: 044 - 2450 2344
www.sathyabama.ac.in

School of Electrical and Electronics Engineering

Minutes of Board of Studies Meeting held on 21st May, 2018

(Venue: Conference Hall, IEC, Sathyabama Institute of Science and Technology, Chennai 119)

Time: 9.00 AM – 11.30 AM

In the beginning of the meeting Dr. N. M. Nandhitha, Dean, School of EEE welcomed all the members and briefed them about the progress of the Department. The BOS members expressed their highly appreciation and satisfaction about the courses and activities of the Department. After that the BOS discussed and resolved the following items:

The Agenda for the meeting was as follows:

- Discussions were held on course structure and course outcomes.
- New & Revised Syllabus
- Inclusion of branch specific and new elective subjects
- Bringing down the overall credits to 180.
- Dr M D Selvaraj. Professor, IIITDM accepted the changes suggested by Dr T.Ravi in the subject 'Programming in HDL'. Dr.Sivakumaran, Prof., NIT, Trichy suggested to include Modeling a test bench, timing and delays , Switch level modeling.
- Dr.S.Lakshmi suggested the change in 'Optical Communication'. Dr.sivakumaran accepted the change.
- The new courses introduced are RF and Microwave Engineering, Data communication and networking, Satellite Communications and Project Work (Phase - II).
- Dr.T.Ravi also presented the new course introduced for PG courses are RTOS Programming, Cloud Computing, High Performance Computing, Advanced Digital Image Processing , Big Data Technologies, RTOS Programming lab.
- The Syllabus Revision carried out in PG courses is VLSI circuit Design for Imaging Applications.
- Dr.Selvaraj suggested specific mentioning should be made in the curriculum with regard to:

a) Program outcomes

b) Program specific outcomes

c) Course objectives

d) Course outcomes

- Dr.Ramadevi suggested the inclusion of Field and HART protocol in 'Logic and Distributed Control system'. Dr.sivakumaran accepted the change.
- Dr.V.Sivachidambaranathan, Prof.& Head, Dept. of Electrical and Electronics Engineering requested Dr.Sundarsingh, Faculty/EEE to present the curriculum revisions before the board for the subject Power System Protection and Switch gear and High Voltage Engineering.
- Dr.V.Sivachidambaranathan, Prof.& Head, Dept. of Electrical and Electronics Engineering requested Dr.Rameshbabu, Faculty/EEE to present the curriculum revisions for the subject Analysis of Inverters before the board.
- They presented the old and new syllabus before the board and discussed the valid additions made in the syllabus.
- Dr.V.Sivachidambaranathan put forth the syllabus of the new courses, 'Industrial Instrumentation and Automation' for the approval of the board. Dr. A.Amalin Prince approved the Syllabus for this new course.

The next BOS meeting may be scheduled on Oct 2018 to review and finalize the syllabus revision process.

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The following internal and external members were present in the meeting.

INTERNAL MEMBERS	SIGNATURE
1. Dr.N.M.Nandhitha	
2. Dr.S.Lakshmi	
3. Dr.V.Vijaya Baskar	
4. Dr.V.Sivachidambaranathan	
5. Dr.T.Ravi	
6. Dr. P. Kavipriya	
7. Dr.P.Chitra	
8. Dr.S.Karthikeyan	
9. Mrs.K.Srilatha	
10. Dr.V.Balamurugan	
11. Mrs.L.Magthelin Therase	
12. Mrs.I.Rexiline Sheeba	
13. Dr.Ramadevi	
14. Mrs.K.Sujatha	
15. Dr.Susitra	

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QUALITY SYSTEM CERTIFICATION DNV·GL ISO 9001:2015

External members

Dr.N.Shivakumaran
Professor,
Dept. of I & C
NIT, Trichy

21/5/18

Dr.M.D.Selvaraj,
Associate Professor,
IIITDM, kancheepuram

Selvaraj
21/5/18

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School of Electrical and Electronics Engineering

Minutes of Board of Studies Meeting held on 16st NOV, 2018

Venue: Conference Hall, IEC

Date: 16-11-18

Time: 9.00 AM – 11.30 AM

- Dr. N. M. Nandhitha, Dean, School of EEE welcomed all members of Board of Studies. On the suggestions of various Experts, the contents are designed by the Board of Studies Members considering the various aspects and need of the society. The members appreciated the contents of the syllabus and it was resolved as under:
- Course outcomes for each course has been discussed and modified.
- Dr.T.Ravi put forth the introduction of new courses 'Advanced Microprocessors', 'Automatic Speech recognition', Pattern Recognition and Image Vision' and 'Advanced Electronic Test Engineering'.
- Dr M D Selvaraj. Professor, IIITDM suggested that RF and Microwave Engineering can be renamed as RF Engineering in VIII semester.
- Dr.Sivakumaran, Prof., NIT, Trichy suggested to have Optical Fibre Communication in VII semester can be replaced with visible light communication. Microprocessor Interfacing and its Applications can be modified as Microprocessor and Microcontrollers.
- Dr.Sivakumaran suggested that subject name can be changed from "Control Engineering" to "Modern Control Systems". The members Dr M D Selvaraj advised to revise the fifth unit of Electronic Devices syllabus.
- Dr.T.Ravi also presented the new course introduced for PG courses are AI and Soft Computing, Network Oriented OS, Scada Systems Applications. The Syllabus Revision carried out in PG courses is Computational Nanoelectronics.
- Dr.V.Sivachidambaranathan requested Dr.Susitra to put forth the syllabus of the new courses, 'Testing and Commissioning of Electrical Equipment ' for the approval of the board. Dr. A.Amalin Prince approved the Syllabus for this new course.
- Dr.N.M Nandhitha putforth to revise the syllabus of B.E by incorporating the following

Develop curricula with relevance to:

- Local needs
- National needs
- Regional needs
- Global needs

Develop existing courses with focus on:

- Employability
- Entrepreneurship
- Skill development.
- Note: If any collaboration is made with any organizations to facilitate the courses, MoU's should be signed with them.

Develop existing courses with focus on:

- Gender
- Environment and Sustainability
- Human Values and Professional Ethics.
- Introduce either Field Projects/research projects or Internships at the end of second and fourth semesters.
- New elective courses namely Advanced microprocessor, Automatic Speech recognition, Pattern recognition and image vision, Advanced Electronic Test Engineering has been introduced.
- The Dean reported the members about the efforts of all the members of Board of Studies to prepare the syllabus of the subject B.E for the academic year 2018-19. The next BOS meeting may be scheduled on April 2019 to review and finalize the syllabus revision process. It was resolved as under, "Resolved that the Appreciation of Board of Studies members who contributed to prepare syllabus be noted." There being no other matter, the meeting was concluded with a vote of thanks .

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EXTERNAL MEMBERS

Dr.N.Shivakumaran
Professor
Dept. of I & C
NIT, Trichy

16/11/18

Dr.M.D.Selvaraj,
Associate Professor,
IIITDM, kancheepuram

Selvaraj
16/11/18

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SYLLABUS REVISION(2018-2019)

SL.NO	COURSE CODE	COURSE NAME
1.	SEC1402	Programing in HDL
2.	SEC1403	Optical Communications

SECX1023	PROGRAMMING IN HDL	L	T	P	Credits	Total Marks
		3	0	0	3	100

course objectives

1. To focus on the basic concept of VHDL and Verilog HDL
2. To Introduce the style of modeling in VHDL and Verilog HDL
3. To focus advanced features of Verilog HDL
4. To outline the formal procedures for testing and verification of HDL
5. To introduce the design of switch level modeling and high level architecture

UNIT I INTRODUCTION TO VHDL **10 hrs**

Digital system design process – Levels of Abstraction – Language elements of VHDL-Operators-Data Types – Signal assignments – Inertial delay mechanism – Transport delay mechanism – Concurrent and Sequential assignments – Delta delay.

UNIT II STYLES OF MODELING **10 hrs**

Process statement – Wait statement – If statement - Loop statement - Assertion statement – Data flow modeling– Concurrent Signal Assignment statement - Structural modeling – Examples – Component declaration – Component Instantiation – Generate statement – Guarded signals.

UNIT III ADVANCED FEATURES **10 hrs**

Generics – Configurations – Configuration Specification – Configuration Declaration - Subprograms – Subprogram Overloading – Operator Overloading - Package declaration and package body – Design Libraries –State Machine Modeling – Moore FSM, Mealy FSM.

UNIT IV VERILOG HDL **10 hrs**

Verilog as HDL – Levels for design description – Language elements – Data Types – Operators – Module structure – Gate primitives – Timing controls – Procedural and Conditional assignments – Data flow Modeling – Structural Modeling – examples.

UNIT V PROGRAMMING USING VERILOG **10 hrs**

Realization of SM charts – Xilinx 3000 series FPGAs – Altera Complex Programmable Logic devices – Static RAM Memory – Interfacing Memory to a Microprocessor Bus – UART design – Design of Microcontroller CPU.

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Course Outcomes

On completion of the course, student will be able to–

CO1	Interpret the basic logic designs.
CO2	Understanding the various modelling to interpret digital system design.
CO3	Analyze the synthesis report.
CO4	Built a RTL schematic and analyze the parameters.
CO5	Determine the performance of combinational and sequential circuits and evaluate the efficiency of Digital design in various applications.

TEXT/REFERENCE BOOKS:

1. J.Bhaskar ,“A VHDL primer”,3rd edition 2004, Prentice Hall of India Limited.
2. J.Bhaskar, “A Verilog HDL Primer”, 3rd edition 2004, Prentice Hall of India Limited.
3. Charles H,Roth ,“Digital system design using VHDL” , 2nd Edition, PWS publishing co., 2005.
4. ZainalabedinNavabi, “VHDL analysis and modeling of digital systems”, 2nd Edition, MGH, 2004.
5. Michael D.Ciletti, “Advanced Digital design with Verilog HDL”, 2nd Edition, PHI Ltd, 2005.
6. T.R.Padmanabhan&Bala Tripura sundari, “Design through Verilog HDL”, WSE2004 IEEE press.
7. Michael D.Ciletti “Advanced Digital design with Verilog HDL", PHI, 2005.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 80 Exam Duration : 3 hrs

PART A :2 Questions from each unit, each carrying 2 marks. No choice **20Marks**

PART B :2 Questions from each unit with internal choice, each carrying 12 marks **60Marks**

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SEC1402	PROGRAMMING IN HDL (For ECE and EEE)	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT1 BASIC CONCEPTS IN VHDL 9 hrs

Digital system design process - Hardware simulation - Introduction to VHDL - Language elements of VHDL - Data objects - Data types - Operators - Signal assignments - Inertial delay mechanism - Transport delay mechanism - Variable assignments - Concurrent and Sequential assignments- Delta delay.

UNIT2 MODELING IN VHDL 9 hrs

Data flow modeling - Concurrent Signal Assignment statements - Structural modeling - Component declaration - Component Instantiation - Behavioral modeling - Process statement - wait statement - Conditional and loop statements -Generics and configurations - Examples for modeling.

UNIT3 INTRODUCTION TO VERILOG HDL 9 hrs

Basic concepts - Levels for design description - Module - Delays - Language elements - Compiler directives - value set - data types - Parameters - Expressions - Operands - operators in Verilog HDL.

UNIT4 STYLES OF MODELING 9 hrs

Gate level modeling -Primitive Gates- Multiple input and multiple output gates - User Defined Primitives - Combination UDP - Sequential UDP- Data flow modeling - Behavioral modeling - procedural constructs - procedural assignments - conditional and loop statements - Structural Modeling - Examples for modeling.

UNIT5 FEATURES IN VERILOG HDL 9 hrs

Tasks- Functions -systems tasks and functions - Verification - Modeling a test bench - timing and delays - Switch level modeling - state machine modeling - Moore FSM – Melay FSM - Design of memories - Design of microcontroller CPUs.

Max. 45 hrs

COURSE OUTCOMES:

On completion of this course, students are able to

CO1	Identify the use of HDL language in constructing digital logic circuits
CO2	Analyze the combinational sequential logic circuit in gate and switch level modeling
CO3	Conceptualize the system through design and modeling various architectures
CO4	Develop any design based upon the system requirements for solving real time problems
CO5	Validate and Verify the system design
CO6	Design a test bench for any logic circuit

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TEXT / REFERENCE BOOKS:

1. J.Bhaskar, “A VHDL Primer”, Pearson. 3rd edition, 2013
2. Douglas L. Perry, "VHDL Programming by Example", McGraw Hill, 4th edition, 2012
3. J.Bhaskar, “A Verilog HDL Primer”, Star Galaxy Publishing. 3rd edition, 2011
4. Stephen Brown, "Fundamental of Digital logic with VHDL Design", Tata McGraw Hill,3rd edition, 2012

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100 **Exam Duration: 3 hrs**

Part A: 10 questions of 2 marks each -No choice **20 Marks**
Part B: 5 questions from each unit with internal choice, each carrying 16 marks **80 Marks**

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SECX1038 (old)	OPTICAL COMMUNICATION (Common to ECE,ETCE)	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT I INTRODUCTION **10 hrs.**

Introduction to vector nature of light, propagation of light, propagation of light in a cylindrical dielectric rod. Rays and Modes. Different types of optical fibers, Modal analysis of a step index fiber, Linearly Polarized Modes, Singlemode fibers and Graded- Index Fiber.

UNIT II SIGNAL DEGRADATION AND OPTICAL SOURCES **10 hrs.**

Attenuation- Absorption, Scattering Losses, Bending Losses, Core and Cladding Losses. Signal distortion in Optical waveguides- Material Dispersion, Waveguide Dispersion. Optical sources - Semiconductor Device Fabrication, LED and LASER diode - Principles of operation, concepts of line width, phase noise, switching and modulation characteristics.

UNIT III OPTICAL DETECTORS **10 hrs.**

Optical detectors – pn detector, pin detector, avalanche photodiode - Principles of operation, concepts of responsivity, sensitivity and quantum efficiency, noise in detection. Multichannel Transmission Technique- Multichannel Frequency Modulation, Subcarrier multiplexing. WDM Concepts and Components.

UNIT IV OPTICAL AMPLIFIERS **10 hrs.**

Basic concepts, semiconductor amplifier, Erbium-Doped Fiber Amplifier, Raman amplifier, Brillouin amplifier - principles of operation, amplifier noise, signal to noise ratio, gain, gain bandwidth, gain and noise dependencies,
intermodulation effects, saturation induced crosstalk, wavelength range of operation.

UNIT V OPTICAL NETWORKS AND DISPERSION COMPENSATION **10 hrs.**

Optical networks: SONET/SDH, ATM, IP, Wavelength routed networks, soliton communication system, fiber soliton, Soliton based communication system design, High capacity and WDM soliton system. Limitations, Post and Precompensation techniques, Equalizing filters, fiber based gratings, Broad band compensation - applications.

Course Outcomes

On completion of the course, student will be able to–

CO1	Recall the basic optical laws and recognizing the types of optical fiber cables. Identifying the signal impairments in optical systems
CO2	Exemplify the characteristics of optical sources and detectors. Summarize the conversion of light energy into electrical energy and vice versa.
CO3	Implementing the transmission techniques and concepts in designing electrical engineering problems

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CO4	Select an appropriate amplifier by critically evaluating its noise parameters
CO5	Create the opportunity to design optical communication system for industrial applications

TEXT BOOKS:

1. Keiser. G, “Optical fiber communications”, 4th Edition Tata McGraw-Hill, New Delhi, 2008.
2. Agrawal. G.P, “Fiber-Optic Communication Systems” 3rd Edition John Wiley & Sons, 2002.

REFERENCE BOOKS:

1. John Gowar, “Optical Communication Systems”, 2nd Edition Prentice Hall, 1993.
2. Franz & Jain, “Optical communication, Systems and Components”, Narosa Publications, New Delhi, 2000.
3. Karminvov & T. Li “Optical Fibre Telecommunications”, Vol A & B, Academic Press, 2002.

SEC1403 (Revised)	OPTICAL COMMUNICATION (Common to ECE,ETCE)	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT1 INTRODUCTION TO OPTICAL FIBERS **9 hrs**

Basics of optical communication system, light propagation in optical fibers, Optical spectral bands, Advantages of optical fiber communication over other communication systems, Ray theory and mode theory. Total internal reflection, Acceptance angle, Numerical aperture, phase and group velocity, cutoff wavelength and group delay. Different types of optical fibers, refractive index profiles & mode transmission

UNIT2 TRANSMISSION CHARACTERISTICS AND OPTICAL AMPLIFIER **9 hrs**

Characteristics of optical fibers: Attenuation due to absorption, scattering &bending, core and cladding loses, Signal Distortion in optical fibers: Intra modal Dispersion: Material &Waveguide dispersion; Intermodal dispersion: MMSI, MMGI &modal noise Optical Amplifiers: Basic concepts, Erbium-Doped Fiber Amplifier, Raman amplifier -principles of operation, amplifier noise, signal to noise ratio, gain, gain bandwidth, intermodulation effects and wavelength range of operation

UNIT3 OPTICAL TRANSMITTERS AND RECEIVERS **9 hrs**

Fiber optic Transmitter module, Optical sources- LEDs, LASER diodes- Principles of operation: concepts of line width, phase noise. Optical detectors- PN, P-I-N, Avalanche photodiodes: Principles of operation: concepts of responsivity, sensitivity and quantum efficiency, noise in detection. Fiber optic receiver module

UNIT4 COUPLERS, CONNECTORS AND OPTICAL LINK **9 hrs**

Couplers: 2x2 coupler, Tap coupler, star coupler, Connectors: Cylindrical ferrule, Biconical Ferrule, Double eccentric, Splices: Fusion splices, Mechanical splices, Multiple splices. Design considerations in optical links, Point to point Links: Link Power budget, Rise Time budget, Analog Links: CNR, Multichannel transmission techniques-Multichannel Frequency Modulation, Subcarrier multiplexing.WDM Concepts and Components

UNIT5 OPTICAL NETWORKING PRINCIPLES AND APPLICATIONS **9 hrs**

FDDI, WDM, SONET/SDH, ATM, IP over WDM, Optical LAN Standards-IEEE802.3, Broad band and select WDM networks, Applications- Military

Max. 45

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COURSE OUTCOMES:

On completion of this course, students are able to

CO1	Illustrate the basics of optical fiber cables
CO2	Describe the attenuation and dispersion characteristics in optical systems and comprehend the types of optical amplifiers
CO3	Distinguish the sources and detectors for real-time applications
CO4	Design optical communication system based on link budget
CO5	Evaluate the capacity of the systems using different networking techniques
CO6	Develop fiber distributed services for military application

TEXT / REFERENCE BOOKS:

1.GerdKaiser,"Optical Fiber Communications",4thedition,Sixthreprint,TataMcGrawHill,NewDelhi,2009

2. John M. Senior, "Optical Fiber Communications- Principles And Practice", Third Edition, Pearson Education,2010

3. Gerd Keiser, "Optical communications Essentials", Tata Mc Graw Hill, Special Indian Edition, 2009

4. Govind P Agrawal,"Fiber-Optic Communication Systems", John Wiley & Sons, Third Edition, 2011

5. Ivan P. Kaminow, Casimer DeCusatis, "The Optical Communications Reference", Academic Press, 1st edition, 2009

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