



# SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)

Declared as Category 'A' University by MHRD, Govt. of India

Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai – 600 119, Tamilnadu. India.



## School of Electrical and Electronics

**DATE: 30-04-2016**

**VENUE: VLSI LAB**

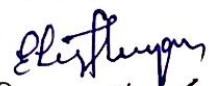




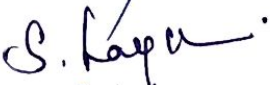






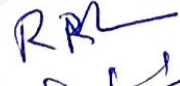
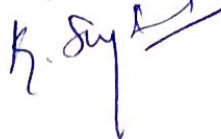
**TIME: 10.30 a.m. to 12 noon**

### Minutes of Board of Studies Meeting held on 30<sup>th</sup> April, 2016

- Dr.E.Logashanmugam, Faculty Head of EEE at the outset extended his cordial welcome to all the members of the Governing Body and in his introductory remarks, he appreciated the members for their active participation in curriculum revision process. The BOS members expressed their highly appreciation and satisfaction about the courses and activities of the Department. The HODs of ECE, EEE, E&I, E&C and ETCE under the Faculty of Electrical and Electronics, Staff members from the faculty attended the meeting to have an effective interaction with the members as and when required.
- Dr.G.Sundari, Prof. & Head Department of Electronics and Communication started the meeting by welcoming both the external and the internal numbers to the Board of Studies meeting. The guidelines of the syllabus given by the management were explained by HOD to all the members of the BOS. The external members also ratified the decision to revise the syllabus under the mentioned guidelines.
- Dr. M. Madhavi Latha, Professor, JNTU College of Engineering, Hyderabad accepted the changes suggested by Mr.Vino in 'Satellite Communication'.
- Dr,N.M. Nandhitha presented the changes made in the subject ' Programming in MATLAB'. She highlights the added miscellaneous topics- file handling, import & Export – Low Level File I/O – Directory management – FTP File Operations – Time Computations. Dr.Ram Bilas Pachori, Professor, IIT appreciated the effort done by Dr.N.M.Nandhitha.
- Mr.Vino suggested the changes made in 'Digital Logic Circuits' Dr. M. Madhavi Latha accepted the changes. Dr.T.Ravi presented the new course introduced to the students 'Probability Theory and Random process'.
- Dr.T.Ravi also presented the new course introduced for PG courses are Testing of VLSI Circuits, High Speed VLSI design, VLSI for Wireless Communication, ASIC Design, Design of Semiconductor memories and RF circuits Design for M.E. Embedded system. The Syllabus Revision carried out in PG courses is Embedded System Modelling Using UML.

- Dr.R.Ramadevi presented the changes made in the process control lab by adding experiment related to fuzzy Logic and Neural Network Application as per the suggestion given by Dr.Sivakumaran.
- Dr.V.Sivachidambaranathan, Prof.& Head, Dept. of Electrical and Electronics Engineering requested Dr.Susitra, Faculty/EEE to present the curriculum revisions before the board.
- She has presented the old and new syllabus for DC machines and transformer (theory and practical) before the board and discussed the valid additions made in the syllabus.
- Dr.V.Sivachidambaranathan put forth the syllabus of the new courses, 'Advanced Power Electronics', 'Electric Vehicles' for the approval of the board. Dr.N Sivakumaran approved the Syllabus for these new courses.

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

INTERNAL MEMBERS	SIGNATURE
1. Dr.E.Logashanmugam	
2. Dr.G.Sundari	
3. Dr.N.M.Nandhitha	
4. Dr.V.Sivachidambaranathan	
5. Dr.V.Vijaya Baskar	
6. Dr.S.Lakshmi	
7. Dr.T.Ravi	
8. Dr.V.G.Sivakumar	
9. Dr. P. Kavipriya	
10. Dr.P.Chitra	
11. Dr.S.Karthikeyan	
12. Ms.K.Srilatha	
13. Dr.R.Ramadevi	
14. Mrs.K.Sujatha	

15. Dr.Susitra

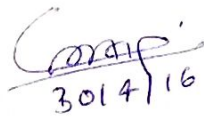


**EXTERNAL MEMBERS**

Dr. M. Madhavi Latha  
Professor, JNTU College of Engineering  
Hyderabad



Dr.Ram Bilas Pachori  
Professor, IIT Indore



Dr.Sivakumaran,  
Professor, NIT, Thiruchirapaali





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## School of Electrical and Electronics

**DATE 26-11-2016**

**VENUE: VLSI LAB**

**TIME: 10.30 a.m. to 12 noon**

### Minutes of Board of Studies Meeting

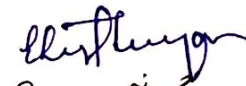









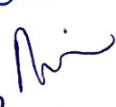



- Dr.E.Logashanmugam, Faculty Head of EEE at the outset extended his cordial welcome to all the members of the Governing Body and in his introductory remarks, he appreciated the members for their active participation in curriculum revision process. The BOS members expressed their highly appreciation and satisfaction about the courses and activities of the Department.
- Dr.G.Sundari, Prof. & Head Department of Electronics and Communication started the meeting by welcoming both the external and the internal numbers to the Board of Studies meeting (26-11-2016, 10.30 a.m. to 12.00 noon).
- The guidelines of the syllabus given by the management were explained by HOD to all the members of the BOS.
- The external members also ratified the decision to revise the syllabus under the mentioned guidelines.
- Dr S Lakshmi, proposed syllabus revision in 'Spread Spectrum Communication'. Dr.M. Madhavi Latha, Professor, JNTU College of Engineering, Hyderabad accepted the changes.
- Dr. M. Madhavi Latha accepted the changes incorporated in the subject' Audio Signal Processing suggested by Dr.P.kavipriya.
- Dr.S.Karthikeyan presented the changes made in 'Analog Communication'. Dr.Ram Bilas Pachori accepted the changes.
- Ms.K.Srilatha presented the changes made in 'Electronic Circuit II'. Dr.Ram Bilas Pachori accepted the changes.
- Dr T Ravi presented the new 'Object Oriented Programming Lab ' for enriching the programming language to students which will be helpful during placement. The two courses introduced are Radar and Navigational Aids' and 'Television Engineering'

- To enrich the knowledge of student with real time industrial environment the five credit course 'Professional Training 1' was introduced to the students was put forth by Dr.G. Sundari.
- Dr.R.Ramadevi suggested few electives for EIE, AsTheory Of Robotics And Automation, Fundamentals of Mechatronics and Instrumentation And Control In Iron And Steel Industries
- Dr.V.Sivachidambaranathan, Prof.& Head, Dept. of Electrical and Electronics Engineering requested Dr.Rameshbabu, Faculty/EEE to present the curriculum revisions before the board.
- He presented the old and new syllabus for AC machines Lab before the board and discussed the valid additions made in the syllabus.

The meeting ended with vote of thanks from the Faculty Head Dr.E.Logashanmugam.

#### INTERNAL MEMBERS

#### SIGNATURE

1. Dr.E.Logashanmugam 
2. Dr.G.Sundari 
3. Dr.N.M.Nandhitha 
4. Dr.V.Sivachidambaranathan 
5. Dr.V.Vijaya Baskar 
6. Dr.S.Lakshmi 
7. Dr.T.Ravi 
8. Dr.V.G.Sivakumar 
9. Dr. P. Kavipriya 
10. Dr.P.Chitra 
11. Dr.S.Karthikeyan 
12. Ms.K.Srilatha 
13. Dr.R.Ramadevi 
14. Mrs.K.Sujatha 

15. Dr.Susitra

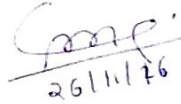


**External members**

Dr. M. Madhavi Latha  
Professor, JNTU College of Engineering  
Hyderabad



Dr.Ram Bilas Pachori  
Professor, IIT Indore



Dr.Sivakumaran,  
Professor, NIT, Thiruchirappalli



**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**NEW COURSES(2016-2017)**

<b>SL.NO</b>	<b>COURSE CODE</b>	<b>COURSE NAME</b>
1.	SEC1213	PROBABILITY THEORY AND RANDOM PROCESS
2.	SCS4201	OBJECT ORIENTED PROGRAMMING LAB
3.	S14PT1	PROFESSIONAL TRAINING – 1
4.	SECX1060	RADAR AND NAVIGATIONAL AIDS
5.	SECX1043	TELEVISION ENGINEERING

<b>SEC1213</b>	<b>PROBABILITY THEORY AND RANDOM PROCESS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>	<b>Total Marks</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>100</b>

### UNIT 1 PROBABILITY THEORY

12 hrs

Probability Theory: Random experiment, Definition of probability, Axioms of Probability, Probability Space, Theorem (without proof), Concept of a Random Variables (Discrete and Continuous), Functions of Random Variables

### UNIT 2 RANDOM VARIABLES

12 hrs

Probability Distributions: Discrete distributions: Binomial distribution, Poisson distribution, Geometric distribution  
Distributions: Uniform distribution, exponential distribution, Normal distribution (problems only).

### UNIT 3 RANDOM PROCESS

12 hrs

Two Dimensional Random Variables : Two dimensional random variables, probability functions(x,y) , Joint Marginal and conditional probability distributions, Independent random variables, Transformation of two dimensions

### UNIT 4 DISCRETE PARAMETER MARKOV CHAINS

12 hrs

Random Process: Random Process concept, Classification of random process, Stationary process, strict sense stationary process, Wide sense stationary processes, Poisson Process (Problems only) , Auto correlation and its properties (problems only).

### UNIT 5 CONTINUOUS PARAMETER MARKOV CHAINS

12 hrs

Queuing Theory : Introduction to Concept of Queuing Models -Symbolic representation of a queuing model, characteristic of queuing system, single server models (M/M/1):(∞/FCFS) and (M/M/C):(∞/FCFS) - Multiple server Models (M/M/1):(N/FCFS) and (M/M/C):(N/FCFS)- Problems only.

### COURSE OUTCOMES:

On completion of this course, student will be able to

CO1	Appraise various probability distribution functions
CO2	Evaluate several probability values involving two dimensional random variables
CO3	Predict the properties of random processes and its various types
CO4	Create State classification and Pollaczek-Khinchin transform equation
CO5	Analyse Markovian model queueing systems with multi server and infinite/finite capacity
CO6	Develop continuous parameter Markov chain



**TEXT / REFERENCE BOOKS**

1. T. Veerarajan, "Probability, statistics and Random Processes", Tata McGraw-Hill Publishing Company Ltd., 2005
2. J. Medhi, "Stochastic Processes", New Age International (P) Ltd., Third Revised Edition, 2010

**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**

<b>SCS4201</b>	<b>OBJECT ORIENTED PROGRAMMING LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>	<b>Total Marks</b>
		<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>100</b>

1	Develop a C++ program to implement a class, object creation, member function invocation concept	4 hrs
2	Develop a C++ program to implement the various constructors and destructor concept	3 hrs
3	Develop a C++ program to implement a friend function, Inline function	3 hrs
4	Develop a C++ program to implement an operator (Unary & Binary) overloading concept	5 hrs
5	Develop a C++ program to implement a function overloading concept	3 hrs
6	Develop a C++ program to implement a run time polymorphism	4 hrs
7	Develop a C++ program to implement the following inheritance types: a. Single b. Multiple c. Multilevel d. Hierarchical e. Hybrid	6 hrs
8	Develop a C++ program to implement an Abstract class concept.	4 hrs
9	Develop a C++ program to implement a Virtual function.	4 hrs
10	Develop a C++ program to find the number of characters in a file	4 hrs
11	Develop a C++ program to handle the exceptions.	5 hrs

#### **COURSE OUTCOMES:**

On completion of this course, student will be able to

CO1	Describe the procedural and object-oriented paradigm with concepts of streams, classes, functions, data and objects
CO2	Explain the difference between object-oriented programming and procedural oriented language and data types in C++
CO3	Describe dynamic memory management techniques using pointers, constructors, destructors, etc.
CO4	Describe the concept of function overloading, operator overloading, virtual functions and polymorphism
CO5	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming
CO6	Develop program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc

<b>SECX1060</b>	<b>RADAR AND NAVIGATIONAL AIDS</b> (Common to ECE, ETCE)	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>	<b>Total Marks</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>100</b>

**UNIT 1 RADAR BASICS**

**10 hrs**

Basic Radar-The Origins of Radar, Simple form of Radar Equation-Radar Block Diagram-Radar Frequencies-Application of Radar. The Radar Equation: Introduction-Detection of Signals in noise-Receiver noise and the Signal-to-Noise Ratio-Probability Density Function-Probabilities of Detection and False Alarm-Integration of Radar pulses-Radar Cross Section of Targets-Radar Cross Section Fluctuations-Transmitter Power-Pulse Repetition Frequency-Antenna Parameters-System Losses-Other Radar Equation Considerations.

**UNIT 2 MTI AND PULSE DOPPLER RADAR**

**10 hrs**

Introduction To Doppler and MTI Radar-Delay- Line Cancelers-Staggered Pulse Repetition Frequencies-Doppler Filter Banks-Digital MTI Processing-Moving Target Detector-Limitation of MTI Performance-Pulse Doppler Radar-Other Doppler Radar Topics-Tracking with Radar-Monopulse Tracking-Conical Scan and Sequential Lobing-Limitation to Tracking Accuracy-Low-Angle Tracking-Tracking in Range-other Tracking Radar Topics-Comparison of Trackers-Automatic Tracking with Surveillance Radars(ADT)

**UNIT 3 RADAR COMPONENTS**

**10 hrs**

Detection of Signals in Noise: Introduction-Matched-Filter Receiver-Detection Criteria-Detectors-Automatic Detector-Integrators-Constant-False-Alarm Rate Receivers-The Radar Operator-Signal Management-Propagation Radar waves-Atmospheric Refraction-Standard Propagation-Non Standard Propagation. The Radar Antennas: Reflector Antennas-Electronically Steered Phased Array Antennas-Phase Shifter-Frequency-Scan Arrays Radar Transmitters: Introduction-Linear Beam Power Tubes-Solid State RF Power Sources-Magnetron-Crossed Field Amplifier-Other Rf Power Sources-Other aspects of Radar Transmitter. Radar Receivers: The Radar Receiver-Receiver Noise Figure-Superheterodyne Receiver-Duplexers and Receivers Protectors-Radar Displays.

**UNIT 4 BASICS OF NAVIGATION**

**10 hrs**

Introduction-Four Method of Navigation-Radio Direction Finding-The Loop Antenna-Loop Input Circuits-An Aural Null Direction Finder-The Goniometer-Error In Direction Finding-Adcock Direction Finders-Direction Finding at very High Frequencies-Automatic Direction Finders-The Commutated Aerial Direction Finders-Range and Accuracy of Direction Finders Radio Ranges-The LF/MF Four Course Radio Range-VHF Omni directional Range (VOR)-VOR Receiving Equipment-Range and accuracy of VOR-Recent Development Hyperbolic System of Navigation (Loran and Decca)-Loran-A-Loran-A Equipment-Range and Precision of Standard Loran-Loran-C-The Decca Navigation System-Decca Receiver-Range and Accuracy of Decca-The Omega System

**UNIT 5 NAVIGATIONAL SYSTEM**

**10 hrs**

DME and TACAN-Distance Measuring Equipment-Operation of DME-TACAN-TACAN Equipment Aids to Approach and Landing-Instrument Landing System-Ground Controlled Approach System-Microwave Landing System(MLS) Doppler Navigation-The Doppler Effect-Beam Configuration-Doppler frequency Equation-Track Stabilization-Doppler Spectrum-Components of The Doppler Navigation System-Doppler Range Equation-Accuracy of Doppler Navigation System. Inertial Navigation-Principles of Operation-

Navigation Over The Earth-Components of an inertial Navigation System-Earth Coordinate Mechanization-Strapped-Down Systems-Accuracy of Inertial Navigation Systems. Satellite Navigation System-The Transit System-Navstar Global Positioning System(GPS)-Nightvision systems.

**COURSE OUTCOMES:**

On completion of this course, student will be able to

CO1	Analyze the different terminologies used in RADAR systems
CO2	Design the operation of MTI and Pulse Doppler RADAR segment
CO3	Analyze the different component used in RADAR systems
CO4	Apply the corrective & controlling techniques in RADAR systems
CO5	Analyze the fundamental techniques used in Navigation system
CO6	Develop the applications of Navigational System

**TEXT BOOKS :**

1. Merrill I.Skolnik, "Introduction to Radar Systems", Tata McGraw-Hill (3rd Edition) 2003.
2. Nagaraja.N.S, "Elements of Electronics Navigation", Tata McGraw Hill 1993.

**REFERENCE BOOKS :**

1. Nadav Levanon, "Radar Principles", John Wiley and Sons, 1989
2. Peyton Z. Peebles, "Radar Principles", John Wiley & Sons, 2004
3. Toomay.J.C, "Principles of Radar", 2nd edition- PHI, 2004
4. Brookner, "Radar Technology", Artech Hons,1986.

<b>SECX1043</b>	<b>TELEVISION ENGINEERING</b> (Common to ECE, ETCE)	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>	<b>Total Marks</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>100</b>

**UNIT I TV PICTURES AND TV STANDARDS**

**10 hrs**

Geo metric form and aspect ratio of the picture- scanning- interlaced scanning-number of scanned lines- vertical and horizontal resolution – picture brightness- transfer characteristics – negative transmission – VSB transmission –Complete channel bandwidth- reception of VSB signals – allocation of frequency band for TV signals- CCIR and FCC standards.

**UNIT II CAMERA TUBES**

**10 hrs**

Camera tubes requirements- Iconoscope – Image Orthicon- Vidicon –Plumbicon- Silicon diode array-solid array – solid state image scanning- Gamma collection, Requirements of TV broad cast transmission- TV transmitter – Visual exciter- Aural exciter- Diplexer- transmitting antennas – MW TV relay systems- TV via satellites- CCTV- Cable TV – TV receiver as a data communication terminal-tele conference.

**UNIT III TELEVISION RECEIVER**

**10 hrs**

Receiver block diagram- receiving antennas- Balun and TV filters- RF tuners –VHF and UHF tuners, IF response – Wave traps, Video Detector, Video amplifier- DC restoration-Sync separator – Vertical and horizontal output stageEHT generation- Picture tube- Beam deflection- Centering and focusing- Geometric distortion in raster- Sound sections.

**UNIT IV COLOUR TV**

**10 hrs**

Nature of colour- Chromotocity diagram- compatibility with monochrome and vice versa Colour TV- Transmission and Reception-Video Tape recording, VCR/VCPs. Video discs- teletext and video text – Video games.

**UNIT V ADVANCES IN TV TECHNOLOGY**

**10 hrs**

Projection TV- Stereo sound in TV - 3D TV pictures - Digital TV - High definition TV (HD TV) - Flat panel display - LED TV

**COURSE OUTCOMES:**

On completion of this course, student will be able to

CO1	Analyze the different standards used in television
CO2	Analyze the different camera tubes used in monochrome and color television
CO3	Apply the corrective & controlling techniques to bring back the good quality picture and sound in TV
CO4	Analyze the losses in satellite communication and calculate the link budget equation
CO5	Analyze the different multiple access techniques used in satellite communication
CO6	Develop the applications of satellite in network environment

**TEXT BOOKS:**

1. R.R.Gulati, Monochrome and Colour Television, 2nd edition, New Age International publishers, 2004.
2. A.M.Dhake, Television and Video Engineering, 2nd edition, TMH, 2003.

**REFERENCE BOOKS:**

1. Grob and Bernard, Basic television principles and servicing, Mc Graw Hill, 2004.
2. R.R.Gulati, Modern TV practices:Principles, Technologies & servicing, New Age International, 1991