CHAITANYA BHARATI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
Stake holder involvement in Curriculum Development
AY 2019-20

Action taken and implementation in Curriculum

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DEPARTMENT OF ECE
Chaitanya Bharathi Institute of Technolog
Hyderabad-500 075

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Stakeholder involvement in Curriculum Development

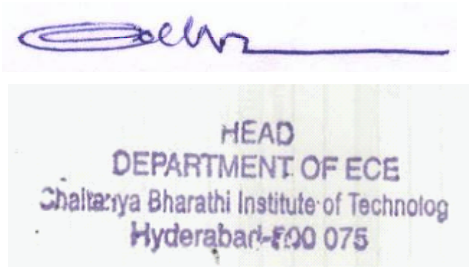
AY 2019-20

Action taken and implementation in Curriculum

1) Industry

S.no.	Suggestions & opinion	Actions Taken
1.	1.In VII Semester there is need to understand the theoretical concepts of computer networks, and laboratory may be introduced for the same.	It is a core course and enough care is taken while drafting the syllabus. This lab course is introduced in the curriculum.
2.	Less emphasis on Random Process for the subject Analog Communication	It is included in the syllabus

1) Industry (Proof)



CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

AICTE Model Curriculum with effect from AY 2021-22

B.E (Electronics and Communication Engineering)

SEMESTER – VII

S. No	Course Code	Title of the Course	Scheme of Instruction			Scheme of Examination			Credits
			Hours per week			Duration of SEE in Hours	Maximum Marks		
			L	T	P/D		CIE	SEE	
THEORY									
1	18ECC26	Computer Networks	3	-	-	3	30	70	3
2	18ECC27	VLSI Design	3	-	-	3	30	70	3
3		Program Elective-IV	3	-	-	3	30	70	3
4		Program Elective-V	3	-	-	3	30	70	3
5		Open Elective-II	3	-	-	3	30	70	3
PRACTICALS									
6	18ECC28	Computer Networks Lab	-	-	2	2	15	35	1
7	18ECC29	Electronic Design and Automation Lab	-	-	2	2	15	35	1
8	18ECC30	Electronics Measurement and Simulation Lab	-	-	2	2	15	35	1
9	18ECC31	Project: Part-1	-	-	4	-	50	-	2
Total			15	-	10	-	245	455	20
Clock Hours Per Week: 25									

L: Lecture **D: Drawing** **CIE: Continuous Internal Evaluation**

T: Tutorial **P: Practical/Project Seminar/Dissertation** **SEE: Semester End Examination**

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DEPARTMENT OF ECE
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18EC C08

ANALOG COMMUNICATION

Instruction	3 L Hours per Week
Duration of SEE	3 Hours
SEE	70 Marks
CIE	30 Marks
Credits	3

Prerequisite: A prior knowledge of signals and systems is required.

Course Objectives:
This course aims to:
1. Introduce the fundamentals of analog communication.
2. Provide the design details of various transmitters and receivers used in analog communication system.
3. Involve the students in analyzing performance of communication system by estimating noise.

Course Outcomes:
Upon completion of this course, students will be able to:
1. Understand various linear and nonlinear modulation schemes.
2. Apply the knowledge of modulation concept to compute various parameters of transmitted signal.
3. Analyze the response of linear system for the given random process.
4. Evaluate the performance of analog communication system through the estimation of noise.
5. Build various transmitters and receivers for the given specifications.

UNIT – I
Linear Modulation Schemes:
Need for Modulation, Double Side Band Suppressed Carrier Modulation, Balanced Modulator, Coherent Detector and Costas Detector. Conventional Amplitude Modulation, Phasor Diagram of AM, Switching Modulator, Envelope Detector. Hilbert Transform and its Properties. Single Side Band Modulation. Vestigial Side Band Modulation.

UNIT – II
Non-Linear Modulation Schemes:
Angle Modulation, Frequency Modulation and Phase modulation, Concept of Instantaneous Phase and Frequency. Types of FM modulation: Narrow Band FM and Wide Band FM. FM Spectrum in Terms of Bessel Functions. Phasor Diagram of NBFM. Direct and Indirect (Armstrong's) methods of FM Generation. Foster–Seeley Discriminator for FM Detection. Introduction to PLL.

UNIT – III
Transmitters and Receivers::
High Level and Low-Level AM Transmitters. Principle and Operation of Tuned Radio Frequency receiver and Super Heterodyne Receivers. Selection of RF Amplifier. Choice of Intermediate Frequency. Image Frequency and its Rejection Ratio, Receiver Characteristics: Sensitivity, Selectivity, Fidelity. Double Spotting, Tracking and Alignment. Pre-emphasis and De-emphasis.

UNIT – IV
Random Process:
Concept of random process, Stationarity and Ergodicity, Auto Correlation and its Properties, Power Spectral Density and its Properties. Linear System with Random inputs: Random Signal Response of Linear System, Auto Correlation of Response.

UNIT – V
Noise: Thermal Noise. White Noise and Colored Noise. Noise Temperature. Noise in Two-Port Network: Noise Figure, Equivalent Noise Temperature and Noise Bandwidth. Noise Figure and Equivalent Noise Temperature for Cascaded stages. S/N Ratios and Figure of Merit Calculations for AM, DSB-SC and SSB systems. Pulse Analog Modulation Schemes: Sampling of low Pass and Band Pass Signals. Types of Sampling. Pulse Modulation Schemes: PAM, PWM and PPM.

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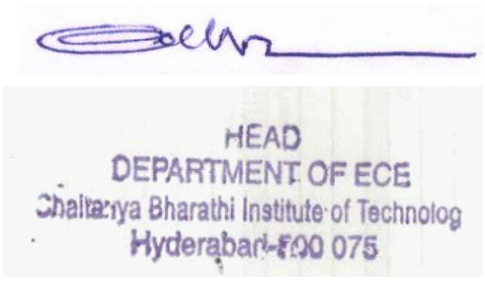
2) Alumni

S.no.	Suggestions & opinion	Action taken
1.	As per the need of the day a separate course on Embedded systems and Software Defined Radio must be introduced.	The course is included in VII Semester.
2.	Less emphasis was given on Random processes in Analog Communication Course	It is included in the syllabus
3.	A separate course on Telecommunication can be introduced in the syllabus which helps to build the career in this field.	It is included in the curriculum as Program Elective in V Semester.
4.	Enhance the Microcontroller Lab with some advanced and latest experiments as it forms the basis for Embedded Systems and IoT	It is included in the syllabus

2) Alumni (Proof)



CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

AICTE Model Curriculum with effect from AY 2021-22

B.E (Electronics and Communication Engineering)

List of Courses in Program Elective-IV		List of Courses in Program Elective-V		List of Courses in Open Elective-II	
Course Code	Title of the Course	Course Code	Title of the Course	Course Code	Title of the Course
18ECE15	Cryptography and Blockchain Technology	18ECE20	CMOS RF IC Design	18CE O02	Disaster Mitigation and Management
18ECE16	DSP Processors and Architectures	18ECE21	Digital Image Processing	18ME O04	Entrepreneurship
18ECE17	Principles of Computational Electromagnetics	18ECE22	Embedded Systems	18CS O06	Fundamentals of DBMS
18ECE18	Semiconductor Memory Design and Testing	18ECE23	Software Defined Radio	18IT O02	Python Programming
18EC E19	Speech Processing	18EC E24	5G Communications	18EG O01	Technical Writing Skills

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18EC C08

ANALOG COMMUNICATION

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Duration of SEE	3 Hours
SEE	70 Marks
CIE	30 Marks
Credits	3

Prerequisite: A prior knowledge of signals and systems is required.

Course Objectives:
This course aims to:
1. Introduce the fundamentals of analog communication.
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4. Evaluate the performance of analog communication system through the estimation of noise.
5. Build various transmitters and receivers for the given specifications.

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UNIT – II
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Noise: Thermal Noise, White Noise and Colored Noise, Noise Temperature, Noise in Two-Port Network: Noise Figure, Equivalent Noise Temperature and Noise Bandwidth. Noise Figure and Equivalent Noise Temperature for Cascaded stages. S/N Ratios and Figure of Merit Calculations for AM, DSB-SC and SSB systems. Pulse Analog Modulation Schemes: Sampling of low Pass and Band Pass Signals. Types of Sampling. Pulse Modulation Schemes: PAM, PWM and PPM.

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

AICTE Model Curriculum with effect from AY 2020-21
B.E (Electronics and Communication Engineering)

List of Courses in Program Elective-I		List of Courses in Open Elective-I	
Course code	**Title of the Course**	**Course code**	**Title of the Course**
18ECE01	Electronic Measurements and Instrumentation	18BT O01	Basics of Biology
18EC E02	Industrial Electronics	18CS O05	Fundamentals of Virtual Reality
18EC E03	Optical Communication	18ME O07	Intellectual Property Rights
18EC E04	Telecommmication Switching Systems	18IT O01	Object Oriented Programming Using Java
		18MT O04	Quantum Computing

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18ECC24

MICROCONTROLLERS LAB

Instruction	2 P Hours per Week
Duration of SEE	2 Hours
SEE	35 Marks
CIE	15 Marks
Credits	1

Prerequisite: Basic knowledge of programming in C language.

Course Objectives:
This course aims to:
1. Develop and understand the 8051 and ARM7 C programming
2. Understand the usage of Integrated Development Environment (Keil)
3. Control the operation of various peripherals using 8051 and ARM7 microcontroller

Course Outcomes:
Upon completing this course, students will be able to:
1. Develop the programs of 8051 and ARM using their respective instruction set.
2. Understand the usage of various debugging tools available to program different microcontrollers
3. Build code for 8051 and ARM7 to interface various input/output modules
4. Analyze the hardware and software interaction and integration.
5. Design and develop the 8051 and ARM 7 based embedded systems for various applications

List of Experiments

I. 8051 Programming

1. Familiarity and use of 8051 microcontroller trainer kit, Keil IDE and simple programs under different addressing modes.
2. Assembly programming using instruction set
3. Timer and counter operations and programming using 8051.
4. Interfacing applications using LED, switch, relay and buzzer.
5. Generation of waveforms using DAC by interfacing it with 8051.
6. Stepper motor interfacing.
7. LCD interfacing.
8. Development of Embedded 'C' Code based on the module specifications. (under Structured enquiry)

II. ARM7 Programming

1. Study and use of LPC214x Microcontroller trainer kit and simple programs using its instruction set
2. Interfacing applications using LED, switch, relay and buzzer.
3. DC Motor interfacing.
4. Programming on-chip ADC.
5. Waveform generation using internal DAC.
6. Development of Embedded 'C' Code based on the module specifications. (under Structured enquiry)

III. Design an experiment related to the Embedded Application of your choice using 8051/ARM based architectures. (under Open ended enquiry)

3) Parent

S.no.	Suggestions &opinion	Action Taken
1.	In IV semester DSD course is studied. With this basics, Verilog and VLSI related courses may be introduced.	VLSI design course is included in the curriculum in VII Semester

3) Parent (Proof)

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A)

AICTE Model Curriculum with effect from AY 2021-22

B.E (Electronics and Communication Engineering)

SEMESTER – VII

S. No	Course Code	Title of the Course	Scheme of Instruction			Scheme of Examination			Credits
			Hours per week			Duration of SEE in Hours	Maximum Marks		
			L	T	P/D		CIE	SEE	
THEORY									
1	18ECC26	Computer Networks	3	-	-	3	30	70	3
2	18ECC27	VLSI Design	3	-	-	3	30	70	3
3		Program Elective-IV	3	-	-	3	30	70	3
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5		Open Elective-II	3	-	-	3	30	70	3
PRACTICALS									
6	18ECC28	Computer Networks Lab	-	-	2	2	15	35	1
7	18ECC29	Electronic Design and Automation Lab	-	-	2	2	15	35	1
8	18ECC30	Electronics Measurement and Simulation Lab	-	-	2	2	15	35	1
9	18ECC31	Project: Part-1	-	-	4	-	50	-	2
		Total	15	-	10	-	245	455	20
Clock Hours Per Week: 25									

L: Lecture **D: Drawing** **CIE: Continuous Internal Evaluation**

T: Tutorial **P: Practical/Project Seminar/Dissertation** **SEE: Semester End Examination**

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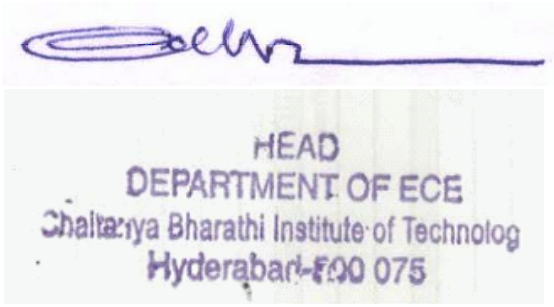
4) Faculty

S. no	Suggestions/Feedback	Action Plan
1.	In RTOS, if possible case studies may be added for better understanding.	The case studies are practiced.
2.	The title of the course may be changed from Electronic Instrumentation to Electronic Measurements and Instrumentation.	The course title has been modified.
3.	In EMI course include the topics on AC and DC bridges.	The said topics are included in the syllabus.
4.	A topic on virtual Instrumentation Lab View may be included	It is include in VII semester Electronics Measurement and Simulation Lab

4) Faculty (Proof)



18ECE28

REAL TIME OPERATING SYSTEMS

(Program Elective - VI)

Instruction	3 L Hours per Week
Duration of SEE	3 Hours
SEE	70 Marks
CIE	30 Marks
Credits	3

Prerequisites: Prior knowledge of Computer Organization and Architecture is required.

Course Objectives:

This course aims to:

1. Learn about the fundamental need of Real Time operating systems.
2. Understand the concepts of different RTOS.
3. Study the Linux based target system design process.

Course Outcomes:

Upon completion of this course, students will be able to:

1. Understand Real-time operating system requirements and applications.
2. Categorize different scheduling approaches for real time scheduler.
3. Differentiate various RTOS features and POSIX standards
4. Analyze the inter task communication in RTOS.
5. Apply the Linux based embedded system design process.

UNIT-I

Introduction to Operating Systems: Operating System objectives and functions, Evolution of operating systems, Developments leading to modern Operating Systems, Virtual machines, OS design consideration for multiprocessor and multicore, Overview on traditional and modern Unix OS, Differences between GPOS and RTOS

UNIT-II

Real Time System Basics: Basic model of a real time system, characteristics, applications, types of real time tasks, timing constraints, Uniprocessor Scheduling: Criteria for scheduling, scheduling algorithms: FCFS, SJF, Priority, Round Robin. **Real Time Task Scheduling:** Earliest Deadline First (EDF): Implementation, shortcoming. Rate Monotonic Algorithm (RMA): Implementation, issues associated with RMA

UNIT-III

Commercial Real Time Operating System: Time services, Features of RTOS, Unix as a RTOS, Non pre-emptive kernel, dynamic priority levels, POSIX: genesis of POSIX, Overview, Real Time POSIX standard, Priority inversion, priority ceiling and priority Inheritance protocols , a survey of contemporary RTOS: PSOS, VRTX, QNX, µC-OS-II and RT-Linux,

UNIT-IV

Introduction to VxWorks: Salient Features, Multitasking, Task state transition, Task Control: Task Creation and Activation, Task Stack, Task Names and IDs, Task Options, Task Information, Task Deletion and Safety, Semaphore and message queues related functions

UNIT-V

Linux Development Process: Types of Host /Target Development and debug setup, Generic Architecture of an Embedded Linux System, System start up, Types of Boot configurations, System Memory Layout, Development Tools: Project Workspace, IDE, GNCC cross platform, selecting and configuring kernel, setting up boot loader.

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18EC E01

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Program Elective-I)

Instruction	3 L Hours per Week
Duration of SEE	3 Hours
SEE	70 Marks
CIE	30 Marks
Credits	3

Prerequisite: Fundamental concepts of Network Theory and Electronic Circuits.

Course Objectives:

This course aims to:

1. Explain basic concepts, definitions and error analysis in measurement.
2. Identify the details of instrumentation and devices intended for a particular application.
3. Elaborate discussion about the importance of signal display devices and analyzers in measurement and describe the various bridge configurations and their applications.

Course Outcomes:

Upon completion of this course, students will be able to:

1. Define the characteristics and analyze the errors of measurement systems.
2. Select the appropriate passive or active transducers for measurement of physical phenomenon.
3. Relate and apply the appropriate measuring techniques to real time applications.
4. Interpret the usage of DVM, Spectrum Analyzer and DSO instruments for appropriate measurements.
5. Develop an understanding of construction and working of different AC and DC bridges and their applications.

UNIT– I

Error - Absolute error, Relative error and Accuracy, Precision - conformity and significant figures, limiting errors, Propagation of errors, Errors in measurement-gross, systematic and random errors, Loading effect, Statistical analysis of measurement data and probable error, Resolution, Sensitivity, Calibration.

UNIT – II

Classification of transducers, Strain gauges - gauge factor, bonded, un-bonded and semiconductor strain gauges, rosettes, LVDT - principle, construction and displacement measurement, Capacitive transducer - principle and thicknessmeasurement, Piezo-electric transducer and different modes of operation, Photo- electric transducers.

UNIT – III

Characteristics, pressure, power and intensity levels of sound, Microphones, Temperature measurement - resistance wire thermometers, semiconductor thermometers and thermocouples.

UNIT – IV

DVMs- ramp, dual-slope integration, integrating and successive-approximation types, digit, resolution, sensitivity and general specifications, Spectrum analyzers, Digital storage oscilloscope, Introduction to Virtual Instrumentation (LabView).

UNIT – V

Introduction to Bridges, DC Bridges - Wheatstone's bridge, Kelvin's bridge, AC bridges - introduction, general balance equation for four arm bridge, capacitance comparison bridge, inductance comparison bridge, Maxwell's bridge, Wien's bridge, Wagner's earth connection.

Text Books:

1. Albert D. Helfric, and William D. Cooper, "Modern Electronic Instrumentation and Measurement Techniques", PHI, 2010.
2. D V S Murthy, "Transducers and Instrumentation", 2nd Edition, PHI, 2013.
3. Nakra B.C, and Chaudhry K.K., "Instrumentation, Measurement and Analysis", 3rdEdition, TMH, 2013.

18EC E01

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Program Elective-I)

Instruction	3 L Hours per Week
Duration of SEE	3 Hours
SEE	70 Marks
CIE	30 Marks
Credits	3

Prerequisite: Fundamental concepts of Network Theory and Electronic Circuits.

Course Objectives:

This course aims to:

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