Shri Shankaracharya Technical Campus, Bhilai

(An Autonomous Institute Affiliated to CSVTU Bhilai)

Scheme of Teaching & Examination (Effective from 2020-2021 Batch)

B. Tech. (Electronics & Telecommunication Engineering) Eighth Semester

Sl. No.	Board of Studies (BOS)	Courses	Course Code	Period per Week			Scheme of Examination			Total Marks	Credit
				L	T	P	Theory/Lab				
							ESE	CT	TA		
1	Electronics & Telecommunication	Power Electronics	**ET105801**	3	1	-	100	20	30	150	4
2	Electronics & Telecommunication	Professional Elective-IV (Refer Table V)	(Refer Table V)	2	1	-	100	20	30	150	3
3	Electronics & Telecommunication	Open Elective-III (Refer Table VI)	(Refer Table VI)	3	-	-	100	20	30	150	3
4	Electronics & Telecommunication	Power Electronics Lab)	**ET105891**		-	2	25	-	25	50	1
5	Electronics & Telecommunication	Virtual LAB(LabVIEW)	**ET105892**		-	2	25	-	25	50	1
6	Electronics & Telecommunication	Capstone Project Phase II	**ET105893**	-	-	16	300	-	150	450	8
Total				**8**	**2**	**20**	**650**	**60**	**290**	**1000**	**20**

Note:

(a) Abbreviations used : L-Lecture, T- Tutorial, P- Practical, ESE- End Semester Exam, CT- Class Test, TA- Teacher's Assessment

(b) The duration of end semester examination of all theory papers will be of three hours.

Table-V (Professional Elective-IV)

Sl. No.	Board of Studies (BOS)	Courses (Subject)	Course Code	Credit
1	Electronics & Telecommunication	Wireless Sensor Networks	**ET105821**	3
2	Electronics & Telecommunication	Consumer Electronics	**ET105822**	3
3	Electronics & Telecommunication	**Radar and Navigational Aids**	**ET105823**	3
4	Electronics & Telecommunication	Biometric Techniques	**ET105824**	3
5	Electronics & Telecommunication	ARM System Architecture & Design	**ET105825**	3

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Chairman (AC)	Chairman (BoS)	Date of Release	Version	

Table-VI (Open Elective-III)

Sl. No.	Board of Studies (BOS)	Courses (Subject)	Course Code	Credit
1	Electronics & Telecommunication	Virtual Instrumentation	**ET100841**	3
2	Electronics & Telecommunication	**Enterprise Resource Planning**	**ET100842**	3

SYLLABUS

B.TECH. (ELECTRONICS & TELECOMMUNICATION ENGINEERING)

EIGHTH SEMESTER

Shri Shankaracharya Technical Campus, Bhilai

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B. Tech. (Electronics & Telecommunication Engineering) Eighth Semester

Subject Code :- ET105801	Power Electronics	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objective	Course Outcomes
1. To understand basic knowledge of Thyristor family members. 2. To understand the various firing schemes for convertors. 3. To understand the operation of power conditioning circuits.	**CO1.** Students will be able to understand the controlled and uncontrolled rectifications. **CO2.** Students will be able to understand Switching and Triggering of SCRs . **CO3.** Students will be able to understand phase control operation of different power electronics devices. **CO4.** Students will be able to understand mechanism of invertors and choppers. **CO5**. Students will be able to understand mechanism of cyclo converters and AC voltage controllers.

UNIT-I: Silicon Controlled Rectifiers: **[CO1]**

Introduction to SCR and its Construction, Principle of Operation, Characteristics & SCR Terminologies, Two-Transistor Analogy of SCR. General idea of Modern Power Semiconductor Devices: Power Diode, Power BJT, Power MOSFET,GTO, DIAC, TRAIC, IGBT, SIT, SITH, MCT, SUS, SBS, SCS. .**[8Hrs]**

UNIT-II: Switching and Triggering of SCRs: **[CO2]**

Different Methods of Turning-ON & Turning-OFF of SCRs, Typesof Triggering Circuits, Series & Parallel Operation of SCRs. Phase Controlled Rectifier I: Phase Angle Control Techniques, Classification of Converter, Single Phase Half and Full Wave Converters with R, RL and RLE Loads . **[8Hrs]**

UNIT-III : Phase Controlled Rectifier II: **[CO3]**

Symmetrical and Asymmetrical Bridge Converters with R and RL Load, Three-Phase three and six pulse Converters, Three-phase fully Controlled Bridge Converters, Dual Converters: Phase Controlled Dual Converter, Single-Phase Dual Converter, Three-Phase Dual Converter, Circulating Current Type Dual Converter: Mid-Point Configuration & Dual Bridge Configuration. **[10Hrs]**

UNIT-IV: Power Conditioning Circuits I: **[CO4]**

Inverters: Single Phase - Half and Full Bridge Inverter with R and RL Load, 3-Phase Bridge Inverter, Mcmurray Full Bridge Inverter. Choppers: Principle of Operation, Chopper Control Technique, Voltage Step-Down (Buck) Chopper & Step-Up (Boost) Chopper, Buck-Boost Chopper, Jones Chopper. . **[8Hrs]**

UNIT-V: Power Conditioning Circuits II: **[CO5]**

A C Voltage Controller: Types of Power Control, Integral Cycle Control, Full Wave AC Voltage Regulator with R and RL, TRIAC based AC Voltage Regulators, Cycloconverters: Single Phase to Single Phase: Midpoint Configuration & Bridge Configuration, Three Phase to Single Phase Cyclo converter: Circulating Current Type, Non-Circulating Current Type.**[7Hrs]**

Text Books:

S.No.	Title	Authors	Publisher
1	Industrial Electronics & Control	B. Paul	PHI
2	Power Electronics	M. D. Singh, Khanchandani	TMH.
3	Power Electronics	P.S Bhimbra	Khanna publications

Reference Books:

S. No.	Title	Authors	Publisher
1	Industrial & Power Electronics	H.C. Rai	Umesh Publications
2	Power Electronics	K. Hari Babu	SCITECH Publications.
3	Power Electronics	P.C. Sen	TMH.

Subject Code: ET105891	Power Electronics Lab	L = 0	T = 0	P = 2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	Lab Period
	25	-	25	50	24Hrs

Course Objective	Course Outcomes
1. The student will understand: The characteristics of power electronic devices with gate firing circuits various forced commutation techniques. 2. The operation of single-phase voltage controller, converters and Inverters circuits with R and RL loads. 3. Analyze the TPS7A4901, TPS7A8300 and TPS54160 buck regulators.	**After completion of this course, the student is able:** **CO1.** To Understand the operating principles of various power electronic converters.. **CO2.** To Use power electronic simulation packages & hardware to develop the power converters. **CO3.** Analyze and choose the appropriate converters for various applications. **CO4.** To understand various rectifier circuits. **CO5.** To understand how a Photoconductive cell may be used to trigger an SCR

List of Experiments: (At least Ten experiments are to be performed by each student)

1. Study of VI characteristic of a silicon controlled Rectifier (SCR).
2. Study of VI characteristic of a DIAC.
3. Study of VI characteristic of a TRIAC.
4. Study of VI characteristic of a UJT.
5. Application of UJT as relaxation Oscillator.
6. Study of Half wave gate controlled rectifier-using SCR.
7. RC triggering Scheme of SCR.
8. Study of Voltage Commutation.
9. Study of Current Commutation.
10. Study of single-phase, Half –controlled, full-wave rectifier using two SCRs, and two diodes.
11. Speed controls of a dc shunt Motor using SCR.
12. Study of a three –phase rectifier using power diodes.
13. Study of a three phase full-wave half –controlled rectifier.
14. To study a TRIAC power control circuit
    (i) use to control the speed of a fan
    (ii) used as a dimmer.
15. To observe how a Photoconductive cell may be used to trigger an SCR.

Laboratory Project: Application of BJT as relaxation Oscillator.

***Note: Laboratory Project is compulsory to all students.**

List of Equipments/Machine Required: Diodes, SPST switch, Transformer, Oscilloscope, Photo cells CRO, Voltmeter, Ammeter, DC shunt motor

Reference Books:

S. No.	Title	Authors	Publisher
1	Fundamentals of Power Electronics	S .K Bhattacharya.,	ISTE
2.	Fundamentals of Power Electronics	S. Rama Reddy.	
3.	Industrial and Power Electronics	Harish C. Rai	

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B. Tech. (Electronics & Telecommunication Engineering) Eighth Semester

Subject Code: ET105892	Virtual LAB(LabVIEW)	L = 0	T = 0	P = 2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	Lab Period
	25	-	25	50	24Hrs

Course Objective	Course Outcomes
1. The objective of this lab is to use LabVIEW for various experiment and to test the systems on a simulation of the NI-ELVIS II+ prototyping board. 2. Building these systems will demonstrate the potential for using simulated instruments in a laboratory. 3. These programs will also obtain data from outside the computer and incorporate it into a program design. 4. The lab will be divided into two parts. Both parts of the lab focus on creating a solution for the assigned problem statement.	**CO1.** With virtual instruments and graphical user interface, a virtual lab provides a low-cost solution to the traditional physical laboratory setup. **CO2.** It also gives the advantage of conducting the experiments without any constraints on time and space. **CO3.** With virtual laboratories, students can preview the background theory, components to be used and experimental procedure **CO4.** Students can confidently conduct experiments in the physical mode as well. **CO5.** The interactive nature of such labs makes learning fun and interesting.

List of Experiments: (At least Ten experiments are to be performed by each student)

1. Build a VI to add and multiply two given numbers and display the Result.
2. Create a VI to find whether the given number is even or odd
3. To design and verify the following simple logic circuits.
   1) Half Adder. 2) Full Adder.
4. To convert a given temp value from degree centigrade to Fahrenheit.
5. Create a VI to find the factorial of given number using for loop and shift registers.
6. Build a VI to Find the Sum of First 10 natural numbers using a for Loop
7. Create a VI to Find the Determinant of a 2 × 2 Matrix which is represented in The Form of 2D Array Using Index Array Function
8. Create a VI to compare the element of two clusters if values of corresponding elements of both VI's are the Same Switch ON an LED in output Cluster
9. Built a VI to Plot a Circle in the XY Graph using For Loop
10. Create a VI to add or subtract two no. use case structure to switch s/w addition & subtraction.
11. Build a VI to find sum and product of array elements.
12. Write a Program in LabVIEW to print the number, the square and the cubes of only even numbers from 0 to 10.

13. Compute the equation (x1+2) * Log(x1) using function, expression node & express formula for the given input x1
14. ECG Signal Processing Using LabVIEW.
15. To apply filtering technique for a given input signal.

Laboratory Project : * To design and verify 4 bit Binary to Gray code Convertor using LabVIEW

***Note: Laboratory Project is compulsory to all students.**

List of Equipments/Machine Required: PCs with LabVIEW software version 2013

Reference Books:

S. No.	Title	Authors	Publisher
1	Virtual Labs-Analog Experiments and Applications of Labview	Neeraj Kumar Reddy Dantu , Nived Chebrolu	LAP Lambert Academic Publishing

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Scheme of Teaching & Examination (Effective from 2020-2021 Batch)

B. Tech. (Electronics & Telecommunication Engineering) Eighth Semester

Subject Code: ET105893	Capstone Project Phase II	L = 0	T = 0	P = 16	Credits =8
Evaluation Scheme	ESE	CT	TA	Total	Lab Period
	300	-	150	450	24Hrs

Course Objective	Course Outcomes
The objective of this course is to improve student's ability to analyze, design and solve complex engineering problems through pedagogies (**Project Based Learning**) that support them in developing these skills. The goal here is not to passively absorb and reiterate information; but rather to actively engage with the content, work through it with others, relate to it through an analysis, use modern tools and effectively solve problems with the corresponding knowledge gained.	**On successful completion of the course, the student will be able to**: **CO1:** Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach. **CO2:** Reproduce, improve and refine technical aspects of engineering projects applying appropriate techniques, resources, and modern engineering and IT tools. **CO3:** Work as an individual and as a member or leader in teams in development of technical projects. **CO4:** Follow management principle and value health, safety and ethical practices during project. **CO5:** Communicate and report effectively project related activities and findings.

The Process Followed to Maintain the Quality of Student Projects are:

a) Allotments of Projects
b) Project Identification
c) Continuous Monitoring
d) Evaluation

a). Allotment of Projects:

i. Individual Student has to submit their areas in which they would like to pursue their projects.
ii. Through meeting and deliberations students are allotted guide depending on their preference and maximum number of students under a faculty is limited to three.

b). Identification of projects: Students are asked to formulate problem statement and state objectives of their project in consultation with the project guide.

c). Continuous Monitoring:

i. Progress is continuously monitored by guide and instructions are given how to proceed further during their project periods as per time table.
ii. Students submit weekly progress report to the project in-charge after consultation with their project guide.

d). Evaluation

i. In order to evaluate projects two project seminars (assessment) are taken in which student present their project through presentations and demonstrate their work.
ii. Students are assessed on the basis of their technical skill implementation, use of modern tools, communication skill, team work, health, safety and ethical practices and

	relevance of the project.
iii.	At the end of the semesters a report is submitted by the students and student's projects are finally evaluated by external examiner in end semester practical examination based on demonstration by students.

SYLLABUS

(Professional Elective-IV)

B.TECH. (ELECTRONICS & TELECOMMUNICATION ENGINEERING)

EIGHTH SEMESTER

Table-V (Professional Elective-IV)

Sl. No.	Board of Studies (BOS)	Courses (Subject)	Course Code	Credit
1	Electronics & Telecommunication	Wireless Sensor Networks	**ET105821**	3
2	Electronics & Telecommunication	Consumer Electronics	**ET105822**	3
3	Electronics & Telecommunication	**Radar and Navigational Aids**	**ET105823**	3
4	Electronics & Telecommunication	Biometric Techniques	**ET105824**	3
5	Electronics & Telecommunication	ARM System Architecture & Design	**ET105825**	3

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Subject Code :- ET105821	Wireless Sensor Networks	L = 2	T = 1	P = 0	Credits = 3
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objective	Course Outcomes
1. To understand the WSN node Architecture and Network Architecture 2. To identify the Wireless Sensor Network Platforms 3. To program WSN using embedded C. 4. To design and Develop wireless sensor node	After completing this course the students should: **CO1.** Understand and explain common wireless sensor node architectures. **CO2**. Be able to carry out simple analysis and planning of WSNs. **CO3**. Demonstrate knowledge of MAC protocols developed for WSN. **CO4**. Demonstrate knowledge of routing protocols developed for WSN. **CO5**. Understand and explain mobile data-centric networking principles.

UNIT-I: Introduction to wireless sensor networks (WSN): [CO1]

Hardware of wireless sensor node, Network deployment, Localization, Coarse grained and fine grained localization, Network wide localization, Theoretical analysis of localization techniques .**[8 Hrs]**

UNIT-II: Time synchronization : [CO2]

Traditional approaches, Fine grained clock synchronization, Coarse grained data synchronization. Medium access and sleep scheduling.[**7 Hrs]**

UNIT-III: Sleep based topology control : [CO3]

Topologies for connectivity, topologies for coverage, Cross layer issues. Energy efficient and robust routing, Metric based approaches, Routing with diversity, Multipath routing, Energy aware routing.**[7 Hrs]**

UNIT-IV: Distributed detection: [CO4]

Distributed detection and estimation in sensor networks.**[7Hrs]**

UNIT-V: Data centric networking : [CO5]

Data centric routing, Data gathering with compression, Querying, Data centric storage and retrieval.**[8 Hrs]**

Text Books:

S.No.	Title	Authors	Publisher
1	Networking wireless sensor nodes	B Krishnamachari	Cambridge University Press
2	Wireless sensor networks: An information processing approach	F Zhao, L J Guibas, Morgan Kaufman	Elsevier, New Delhi

Reference Books:

S. No.	Title	Authors	Publisher
1	SENSORS HANDBOOK	Sabrie Soloman	Mc Graw Hill publication.
2	Wireless Sensor Networks,	Feng Zhao, Leonidas Guibas	Elsevier Publications.
3.	Wireless Sensor Networks: Technology, Protocols and Applications	Kazem Sohrby, Daniel Minoli	Wiley-Inderscience

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B. Tech. (Electronics & Telecommunication Engineering) Eighth Semester

Subject Code :- ET105822	Consumer Electronics	L = 2	T = 1	P = 0	Credits = 3
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objective	Course Outcomes
1. To understand fundamentals of television. 2. To gain knowledge of color TV fundamentals. 3. To understand working of microphones and know concepts of optical recording. 4. To gain knowledge of public address system. 5. To gain knowledge of use of electronics in home and automobiles.	On successful completion of the course, **CO1.**Students will be able to understand the concepts of television. **CO2.** Students gain a deep insight into concepts of color television. **CO3.** Students will be able to know about various microphones and also optical recording technique**.** **CO4.** Students learn the design aspect of PA system**.** **CO5.** Students will be able to get complete knowledge of working of microwave oven, washing machine and in car computers.

UNIT-I: Fundamentals of Television : [CO1]

Elements of Television system, Scanning Process, Scanning Methods and Aspect Ratio, Persistence of Vision and Flicker, Vertical Resolution, Picture Elements, Kell Factor, Horizontal Resolution and Video Bandwidth, Interlacing of Scanning Lines, Video Signals, Control Pulses, Composite Video Signal, TV Standards: 625 Line System..**[7 Hrs]**

UNIT-II: Color TV: [CO2]

Introduction, Color Spectrum, Compatibility Consideration, Color TV Signal, Luminance Signal, Chrominance Signal, Luminance and Chrominance, Recombination to Natural Color Voltages, Interleaving Process. Color Subcarrier Frequency, Phase Errors, Composite Color Signal, High Definition TV, Digital TV.**[8 Hrs]**

UNIT-III: Microphone and Optical Recording: Microphone: [CO3]

Characteristics of Microphones, Construction and working Principles of Microphones, Carbon Microphone, Dynamic Microphone, Capacitor Microphone, Tie Clip Microphone, Wireless Microphone Optical Recording of Audio Signal: Disc Processing of Audio signal, Readout from the Disc, Reconstitution of the Audio Signal.. **[8 Hrs]**

UNIT-IV: Public Address System: **[CO4]**

Loudspeaker. Ideal Loudspeaker, Basic Loudspeaker, Capacitor Loudspeaker, Permanent Magnet Loudspeaker, Voice coil, Loudspeaker Impedance, Acoustic Impedance and Resonance, Woofers, Horn Type Tweeters Loudspeaker System: Horns, Indoor Acoustics. Public Address system: Introduction to PA system. Planning a PA System, Speaker Matching System, PA System Characteristics, PA Amplifiers. **[7Hrs]**

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UNIT-V : Electronics in Home Appliances and Automobiles: **[CO5]**
Microwave Oven: Block diagram, LCD Timer with Alarm, Single Chip Controller, Washing Machine: Electronic Controller for Washing Machine, Washing Machine Hardware, Washing Cycles-Hardware and Software Development, Fuzzy Logic Washing Machine, Electronics in Automobiles: In Car Computers Applications, Electronic Electronic Ignition Lock System. Anti Lock Braking System, Electronically Control Suspension Instruments Panel Displays, Ultrasonic Car Safety Belt System Air Bag System. Vehicle Proximity Detection System, Car Navigation System. **[7 Hrs]**

Text Books:

S.No.	Title	Authors	Publisher
1	Consumer Electronics	S. P Bali	Pearson Publication
2	Color Television	S.P Bali	McGraw Hill.

Reference Books:

S. No.	Title	Authors	Publisher
1	Monochrome and color TV	R.R. Gulati,	New Age International.
2	Basic TV and video systems	Benard Globb.	TMH Pub.
3	Audio and Video System	R.G. Gupta	McGraw Hill.

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B. Tech. (Electronics & Telecommunication Engineering) Eighth Semester

Subject Code :- ET105823	Radar and Navigational Aids	L = 2	T = 1	P = 0	Credits = 3
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objective	Course Outcomes
1. Main objective of this course is to make the students understand the basic concept in the field of Radar and Navigational aids. 2. Students are taught about different types of Radar Systems.	On successful completion of the course, the student will be able: **CO1.**To become familiar with fundamentals of Radar. **CO2.** To gain in depth knowledge about the different types of Radar and their operation. **CO3.** To gain in depth knowledge about the different types of Propagation of Radar Waves . **CO4.** Need for signal detection in Radar and various Radar signal detection techniques **CO4**. To become familiar with Radio Navigation techniques

UNIT-I: Principles and Applications: **[CO1]**

Basic Radar, Radar Block Diagram, Radar Frequencies, Applications of Radar, Radar Range Equation, Probabilities of Detection of False Alarm Integration of Radar Pulses, Radar Cross Section of Targets.**[7 Hrs]**

UNIT-II: MTI And Pulse Doppler Radar: **[CO2]**

Introduction to Doppler and MTI Radar, Delay Line Cancellers, Staggered PRF, Range Gated Doppler Filter, Limitations to MTI Performance, Tracking with Radar, Monopulse Tracking, Conical Scan and Sequential Lobing, Limitations to Tracking Accuracy, Low Angle Tracking, Tracking in range, Comparison of Trackers.**[8 Hrs]**

UNIT-III: Propagation of Radar Waves: **[CO3]**

Forward Scattering from a Flat Earth, Scattering from Round Earths Surface, Atmospheric Refraction-Standard Propagation, Non-Standard Propagation, Diffraction, Attenuation by Atmospheric Gases, External or Environmental Noise, Other Propagation Effects. **[8 Hrs]**

UNIT-IV: Antennas for Detection of Radar Signals: **[CO4]**

Parabolic Antennas, Introduction to Phased Array, Cosecant Squared Antenna Radome. **[7Hrs]**

UNIT-V : Radar Transmitter and Receiver: **[CO5]**

Radar Receiver, Receiver Noise Figure, Super heterodyne Receiver, Duplexers and Receiver Protectors, Radar Displays, introduction to ECM and ECCM, Linear Beam Power Tubes, Solid State Power Sources, Magnetron. **[7 Hrs]**

Text Books:

S.No.	Title	Authors	Publisher
1	Introduction to Radar Systems	M. I Skolnik,	TMH Pub. Co.
2	Microwave Radar and Navigational Aids	A.K. Sen and A. B. Bhattacharya	Khanna Publisher

Reference Books:

S. No.	Title	Authors	Publisher
1	Radar: Principles, Technology, Applications	Edde	Pearson Education Pub.
2	Elements of Electronic Navigation	Nagaraj	TMH Pub.

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B. Tech. (Electronics & Telecommunication Engineering) Eighth Semester

Subject Code :- ET105824	Biometric Techniques	L = 2	T = 1	P = 0	Credits = 3
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objective	Course Outcomes
1. The basic objective in offering this course is to study the state-of-the-art in biometrics technology can explore the way to improve the current technology. 2. The students can learn and implement various biometrics technologies using advanced algorithm	**On completion of this program student will:** **CO1.** Understand the basic definition of 'Biometric Recognition' and the distinctive of this form of biometrics. **CO2.** Be able to state precisely what functions these systems perform. **CO3**. Be able to draw a system-level diagram for any biometric system and discuss its components. **CO4**. Be able to solve verification, identification, and synthesis problems for a variety of biometrics such as fingerprint, face, iris, hand gestures and cryptography. **CO5.** Be able to use the biometrics ingredients of existing system to obtain a given security goal.

UNIT-I: Introduction of Biometrics: **[CO1]**

Definition, history, basic working architecture, types; Performance measures of biometrics; applications and benefits of biometrics; design of biometrics; biometric identification versus verification. **[8 Hrs]**

UNIT-II: Face and Iris Biometrics: **[CO2]**

Background of face and iris recognition; Face recognition methods: Eigen face methods, contractive transformation method; Challenges of face biometrics; Design of iris biometrics: image segmentation, image preprocessing, determination of iris region; Advantages and disadvantages of face and iris biometrics.**[8 Hrs]**

UNIT-III : Fingerprint and Sign Language Biometrics: **[CO3]**

Fingerprint matching: image acquisition, image enhancement and segmentation, image binarization, minutiae extraction and matching; Sign language biometrics: Indian sign language (ISL) biometrics, SIFT algorithm, advantages and disadvantages of ISL and fingerprint biometrics.**[7Hrs]**

UNIT-IV: Biometric Cryptography and Privacy Enhancement: **[CO4]**

Introduction to biometric cryptography; general purpose cryptosystems; Cryptographic algorithms: DES and RSA; Privacy concerns and issues related to biometrics; biometrics with privacy enhancement; soft biometrics; comparison of various biometrics; Identity and privacy.**[7Hrs]**

UNIT-V : Scope of Biometrics and Biometric Standards: **[CO5]**

Multimodal biometrics: basic architecture and fusion scheme, application, example of AADHAAR; scope and future market of biometrics; role of biometrics in enterprise and border security; DNA biometrics; biometric standards; biometric APIs. **[7Hrs]**

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Text Books:

S. No.	Title	Authors	Publisher
1	Biometrics: concepts and applications	Dr G R Sinha and Sandeep B. Patil,	Wiley India Publications,

Reference Books:

S. No.	Title	Authors	Publisher
1	Introduction to biometrics	Anil K Jain, Arun Ross and Karthik Nandakumar,	Springer
2	Biometrics Identity verification in a networked world	Samir nanawati, Michael Thieme and Raj Nanawati,	US edition of Wiley India

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B. Tech. (Electronics & Telecommunication Engineering) Eighth Semester

Subject Code: ET105825	ARM System Architecture & Design	L = 2	T = 1	P = 0	Credits = 3
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objective	Course Outcomes
1. The objective of this course is to give the students a thorough exposure to ARM architecture. 2. Make the students to learn the ARM programming & Thumb programming models. .	**CO1.**Describe the programmer's model of ARM processor and create and test assembly level programming. **CO2.** Analyze various types of coprocessors and design suitable co-processor interface to ARM processor. **CO3.** Analyze floating point processor architecture and its architectural support for higher level language. **CO4.** Become aware of the Thumb mode of operation of ARM. **CO5.**Identify the architectural support of ARM for operating system and analyze the function of memory Management unit of ARM.

UNIT-I: ARCHITECTURAL FEATURES OF ARM PROCESSOR: **[CO1]**
Processor modes, Register organization, Exceptions and its handling, Memory and memory-mapped I/Os, ARM and THUMB instruction sets, addressing modes, ARM floating point architecture and DSP extensions, ARM coprocessors.**[8 Hrs]**

UNIT-II: ARM 9 TDMI ARCHITECTURAL STUDY: **[CO2]**
H/W architecture, Timing diagrams for various accesses, Memory buses: AMBA, ASB, APB, Case study of Intel Xscale architecture or Samsung ARM implementations.**[8 Hrs]**

UNIT-III : ARM AND THUMB INSTRUCTION SETS: **[CO3]**
Conditional execution and flags, Branch instructions, The barrel shifter, Immediate constants, Single register data transfer, Block data transfer, Stack management, Coprocessor instructions, Register access in Thumb, ARM architecture V5TE new instructions, Assembler workbooks ARM / THUMB INTERWORKING: Switching between states, Branch exchange example, Mixing ARM and Thumb subroutines, ARM to thumb veneer, , Interworking calls, and Interworking using codewarrior.**[8Hrs]**

UNIT-IV: ARM DEVELOPPER SUITE (ADS) OVERVIEW: **[CO4]**
Using the core tools, C/C++ compilers key features, Supplied libraries, Code warrior introduction, Debugging with multi-ICE. ADS INTRODUCTORY WORKBOOK: Compiling and running an example, Creating a header file, Creating a new project, Viewing registers and memory.**[7Hrs]**

UNIT-V : EMBEDDED SOFWARE DEVELOPMENT: [CO5]

ROM or RAM at 0x0, ROM/RAM remapping, Exception vector table, Reset handler, Initialization stack pointers, code and data areas, C library initialization, Scatter loading, Linker placement rules, Long branch veneers, C library functionality, Placing the stack, Debugging ROM images. **[7Hrs]**

Text Books:

S. No.	Title	Authors	Publisher
1	ARM System Developer's Guide: Designing and Optimizing	Sloss Andrew N, Symes Dominic, Wright Chris,	Morgan Kaufman Publication.
2	ARM System-on-Chip Architecture	Steven Furber	Pearson Education

Reference Books:

S. No.	Title	Authors	Publisher
1	Technical reference manual for ARM processor cores, including Cortex, ARM 11, ARM 9 & ARM 7 processor families.		
2	User guides and reference manuals for ARM software development and modeling tools		
3	ARM Architecture Reference Manual,	David Seal,	Addison-Wesley.

SYLLABUS

(Open Elective-III)

B.TECH. (ELECTRONICS & TELECOMMUNICATION ENGINEERING)

EIGHTH SEMESTER

Sl. No.	Board of Studies (BOS)	Courses (Subject)	Course Code	Credit
1	Electronics & Telecommunication	Virtual Instrumentation	**ET100841**	3
2	Electronics & Telecommunication	**Enterprise Resource Planning**	**ET100842**	3

Subject Code :- ET100841	Virtual Instrumentation	L = 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objective	Course Outcomes
1. To review background information required for studying virtual instrumentation. **2.** To study the basic building blocks of virtual instrumentation. **3.** To study the various techniques of interfacing of external instruments of PC. **4.** To study the various graphical programming environment in virtual instrumentation. **5.** To study a few applications in virtual instrumentation.	**On successful completion of the course, the student will be able to:** **CO1.** To know importance of VI in present scenario. **CO2.** To know about application of mathematical tools in Virtual Instrumentation. **CO3.** The students will come to know about Cluster of Instruments in VI System. **CO4.** Develop Concepts of graphical programming - LabVIEW software . **CO5.** To know Various applications of VI.

UNIT- I: Review of Digital Instrumentation: **[CO1]**

Representation of analog signals in the digital domain - Review of quantization in amplitude and time axes, sample and hold, sampling theorem, ADC and DAC.**[8Hrs]**

UNIT- II: Fundamentals of Virtual Instrumentation: **[CO2]**

Concept of virtual instrumentation - PC based data acquisition - Typical on board DAQ card - Resolution and sampling frequency Multiplexing of analog inputs - Single-ended and differential inputs Different strategies for sampling of multi-channel analog inputs. Concept of universal DAQ card - Use of timer-counter and analog outputs on the universal DAQ card.**[7Hrs]**

UNIT- III : Cluster of Instruments in VI System: **[CO3]**

Interfacing of external instruments to a PC-RS232, RS 422, RS 485 and USB standards - IEEE 488 standard-ISO-OSI model for serial bus - Introduction to bus protocols of MOD bus and CAN bus.**[7Hrs]**

UNIT- IV: Graphical Programming Environment in VI: **[CO4]**

Concepts of graphical programming - Lab-view software - Concept of VIs and sub VI - Display types - Digital-Analog Chart-Oscilloscopic types - Loops-Case and sequence structures - Types of data - Arrays - Formulae nodes -Local and global variables - String and file I/O .**[7Hrs]**

UNIT- V : Analysis Tools And Simple Applications in VI : **[CO5]**

Fourier transform - Power spectrum - Correlation - Windowing and filtering tools - Simple temperature

indicator - ON/OFF controller-P-I-D controller - CRO emulation – Simulation of a simple second order system - Generation of HTML page.**[8Hrs]**

Text Books:

S.No.	Title	Authors	Publisher
1.	PC Interfacing for Data Acquisition and Process Control,	S. Gupta and JP Gupta,	Instrument Society of America
2.	Understanding Serial Communications,	Peter W. Gofton	Sybex International.
3.	Learning with Lab-view	Robert H. Bishop	Prentice Hall

Reference Books:

S. No.	Title	Authors	Publisher
1.	PC Interfacing and Data Acquisition: Techniques for Measurement, Instrumentation and Control	Kevin James	Newness
2.	Lab-view Graphical Programming	Gary W. Johnson, Richard Jennings	McGraw Hill Professional Publishing

Shri Shankaracharya Technical Campus, Bhilai

(An Autonomous Institute Affiliated to CSVTU Bhilai)

Scheme of Teaching & Examination (Effective from 2020-2021 Batch)

B. Tech. (Electronics & Telecommunication Engineering) Eighth Semester

Subject Code :- ET100842	Enterprise Resource Planning	L = 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objective	Course Outcomes
1. Identify the important business functions provided by typical business software such as enterprise resource planning and customer relationship management. 2. Describe basic concepts of erp systems for manufacturing or service companies. 3. Analyze the technical aspect of telecommunication systems, internet and their roles in business environment. 4. Develop skills necessary for building and managing relationships with customers, and stakeholders.	**CO1.** To know the basics of ERP **CO2.** To understand the key implementation issues of ERP **CO3.** To know the business modules of ERP • **CO4.** To be aware of some popular products in the area of ERP **CO5.** To appreciate the current and future trends in ERP

UNIT I A Foundation for Understanding Enterprise Resource Planning systems : [CO1]

Reengineering and Enterprise Resource Planning Systems – Planning ,Design ,and Implementation of Enterprise Resource Planning Systems – ERP Systems: Sales and Marketing – ERP Systems: Accounting and finance ERP Systems Production and Materials Management ERP Systems: Human Resources **[8Hrs]**

UNIT II Managing an ERP Project : [CO2]

Supply chain Management and the marketplace – Rules of the game – Winning as a team. ERP Implementation Lifecycle, Implementation Methodology, Hidden Costs, Organizing the Implementation, Vendors, Consultants and Users, Contracts with Vendors, Consultants and Employees, Project Management and Monitoring.**[8Hrs]**

UNIT III Planning Evaluation and selection of ERP systems : [CO3]

ERP Implementation life cycle Pre-evaluation Screening Package Evaluation Project Planning Phase ERP Implementation, Team Training Testing. Call Centers Mean Customer Interaction The functionality, Technological implementation, what is ACD (automatic call distribution), IVR (interactive voice response), CTI (computer telephony integration), Web enabling the call center, Automated intelligent call routing, Logging & Monitoring. **[7Hrs]**

UNIT IV Planning : [CO4]

Forecasting Demand – Scheduling Supply – Improving performance – Mastering Demand – Designing the Chain – Maximizing Performance Introduction to CRM & Automation Definition of CRM technology, CRM technology components, Customer life style, customer interaction, Introduction to eCRM: difference between CRM & eCRM, features of eCRM.**[7Hrs]**

		July 2023	1.00	Applicable for AY 2023-24 Onwards
Chairman (AC)	Chairman (BoS)	Date of Release	Version	

UNIT V The Business Modules : **[CO5]**

Business modeling for ERP Overview, Concept, Significance and principles of business engineering, BRP, ERP and IT business engineering with IT, ERP and management concerns, Building an MIS, Business as a system, Core process in a manufacturing company, Entities for data model in a manufacturing company, Extended ERP. Business modules in an ERP Package, Finance, Manufacturing, Human Resources, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution. **[7Hrs]**

Text Books:

S.No.	Title	Authors	Publisher
1.	ERP concept and Practice-	V.K Garg and N.K Venkatkrishnan	PHI
2.	MIS	S. Sadagopan,	PHI

Reference Books:

S. No.	Title	Authors	Publisher
1.	Analysis and Design of Information Systems	V. Rajaraman	PHI
2.	Information System, Analysis, Design and Implementaion	K.M. Hussain and D. Hussain,	TMH
3.	Concepts of ERP-	Monak and Brady,	Vikas Pub.
4.	Managing with Information	Thomas J Kanter	PHI