Program educational objectives

1. Graduates will able to succeed in positions in engineering practice or research, and in other fields they choose to pursue.
2. Graduates will become a responsible member of society.
3. Graduates will be leaders, both in their chosen profession and in other activities.
4. Graduates will address the complexities of real life engineering problems and be able to formulate solutions that are technically sound, economically feasible & sustainable.

PROGRAM OUTCOMES

Upon successful completion of this course it is expected that electronics graduate will be able to:

a. Understand and proficiently apply the relevant sciences & scientific methods to Electronics engineering to design solutions to complex problems in electronics systems, electronic circuits & control processes.

b. Identify, interpret & critically appraise current developments, advanced technologies and apply them to electronic engineering field to enhance reliability and efficiency of electronics based systems, components and programs.

c. Identify and synthesize the constraints posed by economic factors, safety considerations, environmental impacts and professional standards on Electronics engineering practices and use them for professional judgments in solving the critical field problems for sustainable technological development of nation.

d. Determine, analyze and proficiently apply theoretical and numerical analysis of Phenomenon to

   conceive, control & optimize the performance of Electronics engineering systems used for different applications such as in navigation, automobiles, transportation, and automation.

e. Identify and critically evaluate the performance of a electronics engineering systems in terms of economics, safety, and social and physical environment and implement approaches to minimize any adverse impact leading to sustainable development of society.

f. Understand and proficiently apply a systems approach for electronics system design and addressing the broad contextual constraints, leading to sustainable developments of global level electronics technologies and standards.

g. Show awareness and ability to proficiently apply project management tools and methodologies to the planning and execution of projects leading to electronics engineering solutions of professional standards.

h. Develop & implement creative and innovative approaches to enhance the reliability, efficiency and economical aspect of electronics systems for sustainable improvement of electronics technologies.

i. Communicate effectively on both technical and general issues with peers, associate, clients and the general public to find solutions using technical proficiency.

j Operate effectively and professionally within a team environment to solve complex problems of analyze, design and development of electronics systems.

k. Use all fundamental knowledge of electronics engineering, sciences and mathematics to plan, organize and use resources efficiently to reduce adverse effect on environments.

SY B. Tech (E&TC) Course Outcomes for all subjects

1. BTEXC302 Analog Circuits

Course Outcomes:
On completion of the course, students will be able to:
1. Understand the characteristics of IC and Op-Amp and identify the internal structure.
2. Understand and identify various manufacturing techniques.
3. Derive and determine various performances based parameters and their significance for Op-Amp.
4. Comply and verify parameters after exciting IC by any stated method.
5. Analyze and identify the closed loop stability considerations and I/O limitations.
6. Analyze and identify linear and nonlinear applications of Op-Amp.
7. Understand and verify results (levels of V & I) with hardware implementation.
8. Implement hardwired circuit to test performance and application for what it is being designed.

2. BTEXC303 Electronic Devices & Circuits

Course Outcomes:
On completion of the course, students will be able to:
1. Comply and verify parameters after exciting devices by any stated method.
2. Implement circuit and test the performance.
3. Analyze small signal model of FET and MOSFET.
4. Explain behavior of FET at low frequency.
5. Design an adjustable voltage regulator circuits.

3. BTEXC304 Network Analysis

Course Outcomes:
On completion of the course, students will be able to:
1. Apply knowledge of mathematics to solve numerical based on network simplification and it will be used to analyze the same.
2. Design passive filters and attenuators theoretically and practically. To apply knowledge for design of active filters as well as digital filters and even extend this to advance adaptive filters.
3. Identify issues related to transmission of signals, analyze different RLC networks.
4. Find technology recognition for the benefit of the society.

4. BTEXC305 Digital Logic Design

Course Outcomes:
On completion of the course, students will be able to:
1. Use the basic logic gates and various reduction techniques of digital logic circuit in detail.
2. Design combinational and sequential circuits.
3. Design and implement hardware circuit to test performance and application.
4. Understand the architecture and use of VHDL for basic operations and Simulate using simulation software.

5. BTHM3401 Basic Human Rights

Course Outcomes:
On completion of the course, students will be able to:
1. Simply put, human rights education is all learning that develops the knowledge, skills, and values of human rights.
2. Strengthen the respect for human rights and fundamental freedoms.
3. Enable all persons to participate effectively in a free society.
4. Learn about human rights principles, such as the universality, indivisibility, and interdependence of human rights.
5. Learn about regional, national, state, and local law that reinforces international human rights law.
6. Learn and know about and being able to use global, regional, national, and local human rights instruments and mechanisms for the protection of human rights.

6. BTEXC401 Electrical Machines and Instruments

Course Outcomes:
On completion of the course, students will be able to:
1. The ability to formulate and then analyze the working of any electrical machine using mathematical model under loaded and unloaded conditions.
2. The skill to analyze the response of any electrical machine.
3. The ability to troubleshoot the operation of an electrical machine.
4. The ability to select a suitable measuring instrument for a given application.
5. The ability to estimate and correct deviations in measurements due to the influence of

the instrument and due to the accuracy of the instrument

7. BTEXC402 Analog Communication Engineering

Course Outcomes:
On completion of the course, students will be able to:
1. Understand and identify the fundamental concepts and various components of analog communication systems.
2. Understand the concepts of modulation and demodulation techniques.
3. Design circuits to generate modulated and demodulated wave.
4. Equip students with various issues related to analog communication such as modulation, demodulation, transmitters and receivers and noise performance.
5. Understand the concepts of modulation and demodulation techniques of angle modulation (frequency and phase).
6. Explain signal to noise ratio, noise figure and noise temperature for single and cascaded stages in a communication system.
7. Develop the ability to compare and contrast the strengths and weaknesses of various communication systems.

8. BTEXC403 Microprocessor

Course Outcomes:
1. Learner gains ability to apply knowledge of engineering in designing different case studies.
2. Students get ability to conduct experiments based on interfacing of devices to or interfacing to real world applications.
3. Students get ability to interface mechanical system to function in multidisciplinary system like in robotics, Automobiles.
4. Students can identify and formulate control and monitoring systems using microprocessors.
5. Students will design cost effective real time system to serve engineering solution for Global, social and economic context.
6. This course understanding will enforce students to acquire knowledge of recent trends like superscalar and pipelining and thus finds recognition of continuous updation.
7. Learn use of hardware and software tools.
8. Develop interfacing to real world devices.

9. BTEXC404 Signals and Systems

Course Outcomes:
On completion of the course, students will be able to:
1. Understand mathematical description and representation of continuous and discrete time signals and systems.
2. Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system.
3. Understand and resolve the signals in frequency domain using Fourier series and Fourier transforms.
4. Understand the limitations of Fourier transform and need for Laplace transform and

develop the ability to analyze the system in s- domain.
5. Understand the basic concept of probability, random variables & random signals and develop the ability to find correlation, CDF, PDF and probability of a given event.

10. BTID405 Product Design Engineering

Course Outcomes: At the end of the course, students will be able to
1. Create simple mechanical or other designs
2. Create design documents for knowledge sharing
3. Manage own work to meet design requirements
4. Work effectively with colleagues.

11. BTBSC406 Numerical Methods and Computer Programming

Course Outcomes:
On completion of the course, students will be able to:
1. Able to solve algebraic and transcendental equations by using numerical techniques and will be able to compare different numerical techniques used for this purpose and also will be able to choose a proper one as per the requirement of the problem.
2. Able to solve a system of linear equations with any number of variables using different direct and iterative numerical techniques.
3. Understand the concept of interpolation, finite difference operators and their relations, and can apply different interpolation techniques on equi-spaced or non equi-spaced data values.
4. Prepare them to write computer programs for the numerical computational techniques.
5. Understand application of the NMCP course in many engineering core subjects like signal processing, digital communication, numerical techniques in electromagnetics etc.
6. Understand procedure-oriented and object oriented programming concepts.
7. Capable of writing C and C++ programs efficiently

TE (E&TC) Course Outcomes for all subjects

1. Power Electronics and Drives

Course Outcomes:
On completion of the course students will be able to
1. Understand various power devices, their firing circuits and communication.
2. Design 1Φ & 3 Φ power converters.
3. Study and design DC to AC converters.
4. Understand DC to DC control techniques.
5. Understand inverter and chopper based drive applications.

2. Digital Communication

On completion of the course, students will be able to:

1.To understand the building blocks of digital communication system.
2.To understand modulation techniques in digital communication.
3. To prepare mathematical background for communication signal analysis.
4.To understand and analyze the signal flow in a digital communication system.

3. Microprocessors and Microcontrollers

Course Outcomes:

At the end of the course, a student will be able to:

1. Assess and solve basic binary math operations using the microprocessor and explain the microprocessor's and Microcontroller's internal architecture and its operation within the area of manufacturing and performance.
2. Apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor and microcontroller.
3. Compare accepted standards and guidelines to select appropriate Microprocessor (8085 & 8086) and Microcontroller to meet specified performance requirements.
4. Analyze assembly language programs; select appropriate assemble into machine a cross assembler utility of a microprocessor and microcontroller.
5. Design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to external devices.
6. Evaluate assembly language programs and download the machine code that will provide solutions real world control problems.

4. Electromagnetic Engineering

Upon successful completion of this course it is expected that engineering graduates will be able to

1. Understand different laws, equations, rules of electric field intensity related to EME.
2. Understand and evaluate energy and potential in an electric field.
3. Understand conductors, dielectrics, and capacitance of a material.
4. Understand magnetics forces, materials and inductance while studying magnetistatics.
5. Analyze wave propagation in an uniform plane wave.

5. Feedback Control System

Upon successful completion of this course it is expected that engineering graduates will be able to

1. Understand and proficiently apply the relevant sciences and scientific methods to electronics engineering.
2. Identify, interpret and critically appraise current developments and advanced technologies and apply them to electronics engineering.
3. Develop and implement creative and innovative approaches to control system (h)
4. Understand and analyze to 1storder and 2^{nd} order system in time domain general applications.

5. Determine analyses and proficiently apply theoretical and numerical analysis of phenomena to conceive, control and optimize the performance of control systems in engineering.
6. Show awareness of and ability to proficiently apply circuit project management tools and methodologies to the planning and execution of projects leading to the electronics engineering solutions of a professional standards.
7. Demonstrates the highest standards of personal performance
8. Demonstrate commitment to lifelong learning and professional development.
9. Understand the responsibilities of electronics engineers to the community' the engineering profession and industrial and business world.
10. Develop and implement creative and innovative approaches to problem solving.

6. Embedded System

Upon successful completion of this course it is expected that student will be able to have following outcomes

1. Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, health and safety, manufacturability, and sustainability.
2. Design, test and critically evaluate embedded solutions to real world situations using (embedded) computer systems interfaced to digital hardware.
3. Build circuits and program the microcontroller in the C programming language.
4. Synchronize hardware and software input/output with switches, lights and motors .
5. Implement an I/O driver and multi-threaded programming.
6. Deal with complex issues in embedded systems both systematically and creatively.
7. Make decisions in complex and unpredictable situations.
8. Work as a team leader to work on complex projects in a project team environment

7. Digital Signal Processing

At the end of course, Student will able to:

1. Compute various transform analysis of Linear Time Invariant System
2. Apply engineering problem solving strategies to DSP problems
3. Design and test signal processing algorithms for various applications.
4. Design and simulate digital filters.
5. Recover information from signals.
6. Understand various applications of DSP such as multi rate signal processing, telecommunication

8. Electronic Circuit Technology

At the end of the course, a student will be able to:

1. Develop an ability study and design different circuits
2. Understand different aspects of Op-amps circuit design
3.To measure different analog quantities
4. Understand different aspects and kinds of digital system design
5. Understand basic theory while designing circuit i.e. design considerations.

BE (E&TC) Course Outcomes for all subjects

1. Satellite Telecommunication (EL-II)

After Completing this course students will be able to:

1. Explain the basics of satellite communication
2. Explain and analyze link budget of satellite signal for proper communication
3. Use the system for the benefit of society
4. Use the different application of satellite communication

2. Microwave & Radar Engineering

After Completing this course students will be able to:

1. Understand basic concepts of microwave communication and transmission
2. Understand building blocks of microwave communication
3. Understand and design microwave generation techniques
4. Understand and learn fundamentals of Radar System.
5. Able to design impedance matching network for any transmission line or system.
6. Able to analyze and find applications and limitations of microwave tube Generators and Amplifiers.

3. Embedded System

Course Outcomes:

Upon successful completion of this course it is expected that student will be able to

1. Understand fundamentals of embedded systems, design paradigms, architectures, possibilities and challenges, both with respect to software and hardware.
2. Practically apply gained theoretical knowledge in order to design, analyze and implement embedded systems, e.g. integrating embedded su00bsystems and applications.
3. Analyze a system both as whole and in the included parts, to understand how these parts interact in the functionality and properties of the system.

4. Wireless Mobile Communication

Course Outcomes:

Upon successful completion of this course students are able to

1. Discuss the cellular system design and technical challenges.
2. Explain classification of mobile communication system.

3. Analyze the mobile radio propagation, diversity concepts, fading and channel modeling.
4. Develop ability to analyze improved data services in cellular communication.

5. Digital Image Processing

Course Outcomes:

After learning the course the students should be able to:

1.Understand the basic image enhancement techniques in spatial & frequency domains.
2.Understand the various kind of noise present in the image and how to restore the noisy image.
3.Understand the basic multiresolution techniques and segmentation methods.
4.Apply different image processing concepts for image handling in various fields.
5.Apply various compression standards studied, reducing the image size for optimizing storage and transmission bandwidth in their image processing related projects.
6.Work as a team leader to work on complex projects in a project team environment

6. Very Large Scale Integration

After successful completion of the course student will be able to:

1.Identify the various IC fabrication methods.
2.Differentiate various FPGA architectures and CPLD architecture.
3.Design an application using Vhdl
4.Concepts of modelling a digital system using Hardware Description Language.
5.Demonstrate a clear understanding of CMOS fabrication flow and technology scaling.
6.Assess the various reliability issues in VLSI technology

7. Optical Fibre Communication

After completion of the course, the student is able to

1.Distinguish Step Index, Graded index fibers and compute modevolume.
2.Explain the Transmission Characteristics of fiber and Manufacturing techniques of fiber/cable.
3.Understand basic laws of optical physics. Distinguish between the various modes of operation of Optical fibers. Identify the various causes for signal degradation.
4.Predict the pulse broadening happening due to the effect of dispersion of the signal.
Classify the construction and characteristics of optical sources and detectors.
5.Discuss splicing techniques, passive optical components and explainn oise in optical system.

8. Consumer Electronics

At the end of the course, the student will be able to
1. List technical specification of electronics Audio system (microphone and speaker).

2. Trouble shoots consumer electronics products like TV, washing machine and AC.
3. Identify and explain working of various colour TV transmission blocks.
4. Understand various functions of various devices related to telecommunication system.
5. Understand the basic functions of various consumer electronic goods.

9. Computer Communication Network

Course Outcomes:

At the end of the course, the student will be able to
1. Able to know basic concepts of computer, computer communication and use of it in networking.
2. Able to know basics of Networking with different switching techniques.
3. Study of Networking topologies: Mesh and Bus toplogy, Star topology & ring Topology.

4. Network Software : device driver for network interface card, LAN, MAN, WAN.
5. Overview of Network model: ISO-OSI and TCP/IP network reference Model.

10. Applied Digital Signal Processing (ADSP)

Course Outcomes:

At the end of the course, the student will be able to
1. Able to know different digital signal, filter techniques and it's algorithms.
2. Able to know multirate signal processing like interpolation and Decimation.
3. To enhance the knowledge of polyphase filter structures and two channel quadrature Mirror filter bank.
4. Need of Adaptive filter, its main components and its algorithms.
5. Able to design Lattice structures AR, MA & ARMA.
6. Able to represent & calculate the characterization of random signals.
7. Ability to estimate autocorrelation and power spectrum of random signals (Bartlett Window & Welch Method)
8. Ability to know different architecture of DSPs and floating & fixed point representations.
9. Case study of TMS320C54XX and introduction of SHARRC processor.
10. Applications of DSP (Ex. Biomedical, Audio-Video systems, Radar System etc.)

People's Education Society's (Mumbai)

P.E.S. College of Engineering, Nagsenvana, Aurangabad 431002

2.6.2 – Pass percentage of students 2018-19

Programme Code	Programme Name	Programme Specialization	Number of students appeared in the final year examination	Number of students passed in final semester/year examination	Pass Percentage
213461210	BE	Mechanical Engineering	104	74	71.15
213429310	BE	Electrical Electronics and Power	112	87	77.65
213437210	BE	Electronics and Telecommunication	17	14	82
213424210	BE	Computer Science and Engineering	61	41	67.21
213419110	BE	Civil Engineering	66	37	56.06

P.E.S. College of Engineering

Result Analysis

Dr..B.A.T.U., Lonere

M.Tech (CSE) May/June 2019 Part-II

SR. NO	Subject	Total	Appeared	Pass	Fail	Passing %
01	DS	04	03	02	01	66%
02	SA	04	03	03	00	100
03	ST	04	03	03	00	100
04	MC	04	03	03	00	100
05	PR	04	03	02	01	66%
06	Seminar -I	04	03	03	00	100
07	SL-II	04	03	03	00	100

Result Analysis

Dr..B.A.T.U., Lonere

M.Tech (CSE) Nov/Dec 2018 Part-I

SR. NO	PRN	NAME OF STUDENTS	CS	CA	ML	ACN	EI-I: NLP	EL-II: HPC	SL-I	Credit
01	2021342018122421000l	ZINJURDE ASHWINI MACHNDRA	Pass	Pass	Pass	Pass	Pass	Pass	Pass	22/22
02	2021342018122421000 2	SHAIKH FATIMA	Pass	Pass	Pass	Pass	Pass	Pass	Pass	22/22
03	2021342018122421000 3	JAWALE PILESH DHANRAJ	Pass	Pass	Fail	Pass	Fail	Pass	Pass	15/22
04	2021342018122421000 5	BANSODE PRATIKA	Fail	Fail	Fail	Fail	Fail	Fail	Fail	0/22
05	2021342018122421000 6	DANDGE ANJALI	Pass	Pass	Pass	Pass	Pass	Pass	Pass	22/22
		NAME OF SUBJECT TEACHER	VRM	SNK	VDJ	VBK	VAL	MMA	VSP	

People's Education Society's(Mumbai)

P. E. S. College of Engineering, Nagsenvana Aurangabad

Department of Computer Science & Engineering

Result Analysis M/J-2018-2019

CLASS : BE (CSE)

Subjectwise Analysis

Sr. No.	Subject	≥66	60-65	40-59	Fail	Absent	Appeared	Total	%Result	Subject Teacher
1	DWDM	5	5	44	7	0	61	61	88.52459	VBK & BMK
2	PDC	3	6	44	8	0	61	61	86.88525	SVB
3	PCD	4	4	41	12	0	61	61	80.32787	ASG
4	VM	3	5	41	12	0	61	61	80.32787	NSS
5	CC	1	3	44	13	0	61	61	78.68852	DTR
6	CSSL	10	10	31	10	0	61	61	83.60656	YSP
7	MOC	16	7	33	5	0	61	61	91.80328	SMS
8	SC	13	16	26	6	0	61	61	90.16393	SNK&RHJ
9	GIT	21	13	23	4	0	61	61	93.44262	VBK&SDP

Overall Result

Class	Distinction	First Class	Second Class	Fail	Absent	Total	Passing Percentage
BE	24	14	3	20	0	61	67.21

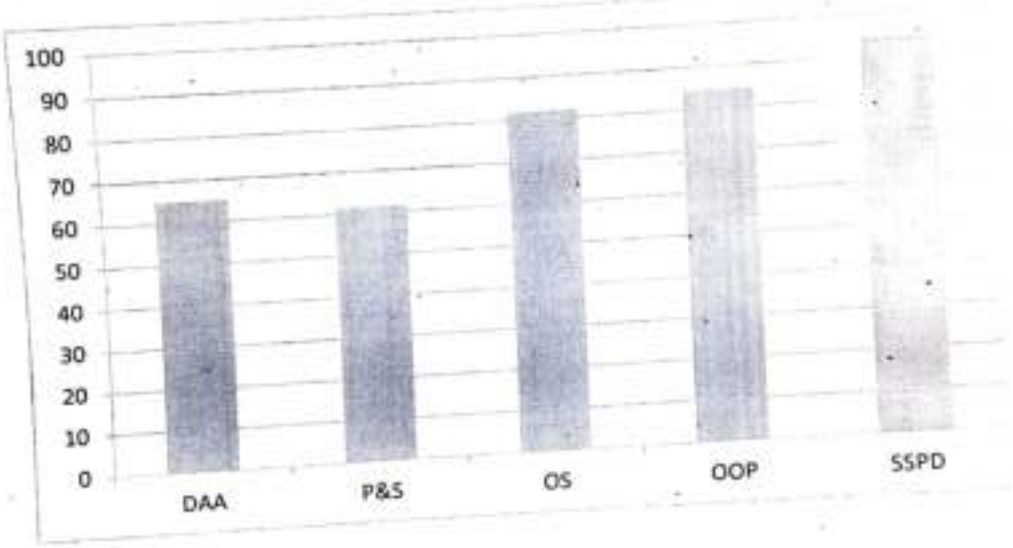
BE CSE Topper

No	Name	Percentage
1	Dalvi Arti Dattatraya	79.8
2	Nirpal Vishakha Janardan	75.87
3	Singh Neha Chetram	74.07

Head CSE

DR. Babasaheb Ambedkar Technological University, Lonere
P.E.S. College of Engineering Aurangabad
SY Btech Computer Science Summer Semester Exam 2019
Result Analysis

Sr No	Subject	Pass	Fail	Appear	Paasing Percentage	Subject Teacher
1	DAA	54	29	83	65.06024096	Prof. V. D. Jadhav
2	P&S	51	32	83	61.44578313	Prof. S. R. Aacharya
3	OS	68	15	83	81.92771084	Prof. K.R. Dahade & Prof. G. R. Goud
4	OOP	70	13	83	84.3373494	Prof. S. V. Bhosale
5	SSPD	78	5	83	93.97590361	Prof. V. R. Mote



Total Result

Class	Students Appeared	Promoted	Not Promoted	Percentage
SY CSE	83	57	26	68.67

Head. CSE

People's Education Society's(Mumbai)

P. E. S. College of Engineering, Nagsenvana Aurangabad

Department of Computer Engineering

Result Analysis M/J 2019 FIFTH & SIXTH SEM

CLASS : T.E

Subjectwise Analysis

Sr. No.	Subject	A++	A+	A	B+	B	C+	C	Fail	Absent	Appeared	Total	Percentage	Subject Teacher
1	OS	0	1	5	4	5	1	7	7	0	30	30	76.6666667	Prof. S. N. Kakarwal & Prof. S. D. Pingle
2	TOC	0	0	0	1	5	4	10	10	0	30	30	66.6666667	Prof. G. R. Goud
3	DBMS	0	0	5	6	5	5	4	5	0	30	30	83.3333333	Prof. S. M. Salve
4	PIJ	0	2	8	3	6	1	4	6	0	30	30	80	Prof. A. U. Jadhav
5	DIP	0	0	2	1	3	4	7	2	0	19	19	89.4736842	Prof. Y. S. Pagar
6	CNAP	0	0	2	0	2	0	4	3	0	11	11	72.7272727	Prof. N. R. Khatri
7	AJ	0	2	9	6	1	2	5	3	2	28	30	89.2857143	Prof. B. M. Kulkarni
8	SE	0	5	8	6	3	1	2	3	2	28	30	89.2857143	Prof. N. S. Syed
9	DAA	0	0	3	3	7	5	3	7	2	28	30	75	Prof. N. R. Khatri
10	NS	0	0	3	2	2	8	5	8	2	28	30	71.4285714	Prof. D. T. Rathod
11	SP	0	3	6	6	5	0	4	4	2	28	30	85.7142857	Prof. A. S. Gadekar

Overall Result FIFTH SEM

Class	A+	A	B+	B	C	Total PASS	FATKT	TOTAL	Passing %
T. E.	3	7	6	1	1	18	12	30	60.00

TE CSE Topper 5th Sem

No	Name	SGPA
1	Chavan Ashvini	7.96
2	Barabote Komal	7.73
3	Mengnar Divyani	7.62

TE CSE Topper 6th Sem

No	Name	SGPA
1	Shejwal Pooja	8.58
2	Hiwrale Nisha	8.54
3	Chavan Ashvini	8.31
4	Shaikh Aksha	8.31

Overall Result FIFTH SEM

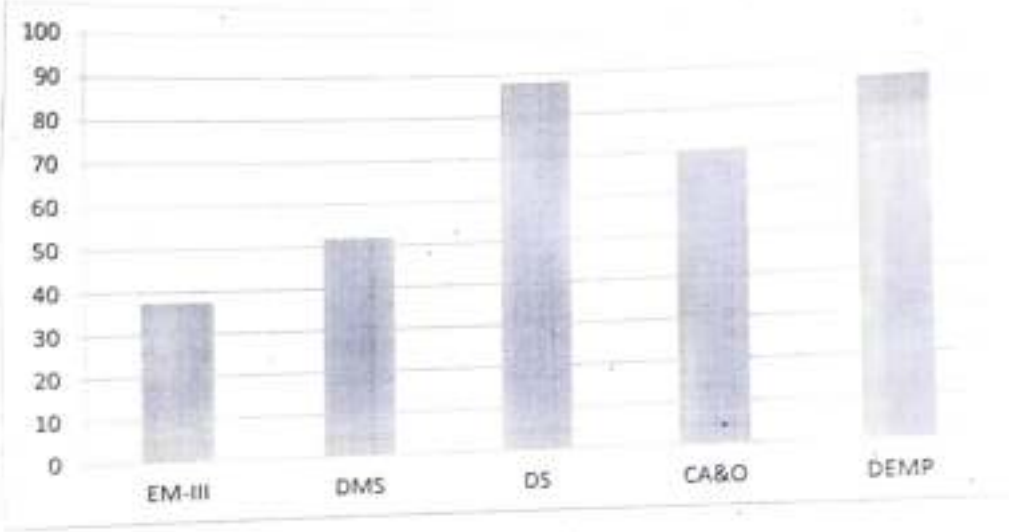
Class	A+	A	B+	Total Pass	Fail	ND*	Total	Passing %
T. E.	7	7	2	16	5	9	30	76.1905

ND* Not Declared due to 2nd Year Back

Head CSE

DR. Babasaheb Ambedkar Technological University, Lonere
P.E.S. College of Engineering Aurangabad
SY Btech Computer Science Winter Semester Exam 2018
Result Analysis

Sr No	Subject	Pass	Fail	Appear	Paasing Percentage	Subject Teacher
1	EM-III	31	52	83	37.34939759	Prof. S. R. Acharya
2	DMS	43	40	83	51.80722892	Prof. R. H. Jadhav
3	DS	73	10	83	87.95180723	Prof. V. D. Jadhav
4	CA&O	58	25	83	69.87951807	Prof. K. P. Dabhade
5	DEMP	71	12	83	85.54216867	Prof. P. K. Ghuge



List of Toppers

Sr No.	Name	SGPA
1	Shettigar Hemant	8.91
2	Khizar Ahmed Biyabani	8.78
3	Talele Pratik	8.61

Head, CSE

PES College of Engineering,Nagsenvana,Aurangabad

Department of Civil Engineering

BE CIVIL STUDENT SUBJECT WISE AVG., **MAY/JUNE 2019**

SR NO		SUBJECT	NAME OF THE SUBJECT TEACHER	≥66	60-65	40-59	FAIL	ABSENT	TOTAL AP	%RESULT
1		EE II	PROF.P.D.ALTE	1	1	50	14	0	66	78.78
2		WRE II	PROF.FATIMA	7	9	44	6	1	66	90.9
3		DOS III	PROF SHOEB ILIYAS	4	7	51	2	0	66	93.93
4		FE	PROF.S.B.DHULE	9	9	36	12	0	66	81.81
5	ELECTIVE I	PC	PROF.R.D.PANDIT	3	3	28	5	0	39	87.17
6	II	TP	PROF.S.B.DHULE	3	7	14	1	0	25	96
7		SM	PROF.R.D.PANDIT	5	7	40	14	0	66	78.78
8		CM	PROF.NASIM AHMED	13	9	37	7	0	66	89.39
9		PP	PROF.C.R GHUSHINGE	4	13	44	6	0	66	92.42
10	ELECTIVE	AS	PROF.PANDIT	12	4	31	6	0	53	88.67
11	II	PD	PROF.S.B.DHULE	0	0	7	3	1	11	63.63
		IWT	SELF PREPARED BY STUDENT	0	0	1	1	0	2	50

Class	Distinction	First Div	Second Div	Failed	ATKT	Absent	Total Appread
NO Of Student	27	7	3	30	Nil	Nil	66
Percentage	40.9	10.66	4.54	45.45	0	0	100

Pass % = 56.06/.

CLASS TEACHER
BE CIVIL ENGG

HOD CIVIL
CIVIL ENGG.DEPT

PRINCIPAL
PESCOE AURANGABAD

FINAL YEAR EEP

PART-I & PART-II 2018 - 19

Subject	Name of The Staff	Class	0-36	37-40	41-60	61-65	66 & Above	Percentage
ED	AMP	A	3.63	1.8	72.72	10.9	10.9	94.57
	SVM	B	5.26	1.71	75.43	1.4	3	93.4
PSP	BNC, AVG	A	1.8	1.8	72.72	14.54	9.0	96.4
	BNC, KKB	B	5.26	0	59.64	28.07	7	94.74
DSP	AAT	A	1.8	0	81.8	7.2	9.0	98.2
	ASP,NDK	B	5.26	1.7	66.666	17.54	8.7	96.44
IA	APP, RUM	A	0	0	67.27	16.36	16.36	100
	APP, AHY	B	3.5	0	33.33	17.54	45.61	96.5
FACTS	SSK, AMP	A	0	1.8	58.18	14.54	25.45	98.2
	SSK, MIW	B	3.5	0	24.56	22.80	49.12	96.5
HVE	VKP	A	9.09	5.45	69.2	10.9	5.45	85.46
	AMP, VKP	B	5.26	0	61.40	19.29	14.03	94.74
PSOC	BNC, AVG	A	25.45	9.09	58.18	1.8	5.45	65.46
	BNC, AVG	B	5.26	5.26	66.66	8.7	14.03	94.74
RE	AMP	A	0	0	67.27	9.09	25.45	100
	KKB	B	3.50	0	24.56	26.31	45.61	96.5
ESPD	SSK, PPF	A	3.63	0	25.45	14.54	56.9	96.4
	SSK. MIW	B	5.26	0	5.26	7.01	82.45	94.74
Total appeared=112			Total passed=87		Fail=25	Pass %		77.65%

HOD
(EEP)

PES College of Engineering , Aurangabad Mech (EPC)

Electrical Department

Part-I **Year 18-19**

Subject	Fail	E&D	C	B	A and ABOVE	Total Student	Passing %	Staff
PSM	3	5	2	3	0	13	77	BNC
RES	0	7	5	1	0	13	100	SSK
APE	5	8	0	0	0	13	62	SVM
HVPT	1	5	6	1	0	13	92	SMK
PQA	3	6	3	1	0	13	77	MSP

Part-II **Year 18-19**

Subject	Fail	E&D	C	B	A and ABOVE	Total Student	Passing %	Staff
PSDC	0	6	4	3	0	13	100	SSK
ASP	0	6	1	6	0	13	100	BNC
SGDA	0	12	1	0	0	13	100	SMK
M&SPE	0	5	5	2	1	13	100	SVM
EM&A	0	6	5	2	0	13	100	MSP

Part-III **Year 19-20**

Subject	Fail	E&D	C	B	A and ABOVE	Total Student	Passing %	Staff
PM	0	0	0	6	4	10	100	SSK
PROJ STAGE -I	0	1	0	0	9	10	100	ALL GUIDE

Part-IV **Year 19-20**

Subject	Fail	E&D	C	B	A and ABOVE	Total Student	Passing %	Staff
PROJ STAGE -I	0	0	0	2	0	2	100	ALL GUIDE

Part-I **Year 19-20**

Subject	Fail	E&D	C	B	A and ABOVE	Total Student	Passing %	Staff
PSM	3	8	5	1	0	17	82	BNC
RES	0	9	6	0	0	17	100	SSK
APE	3	7	6	1	0	17	82	SVM
HVPT	5	7	4	0	0	17	71	SMK
PQA	3	9	6	0	0	17	82	MSP

Part-II **Year 19-20**

Subject	Fail	E&D	C	B	A and ABOVE	Total Student	Passing %	Staff
PSDC	4	8	2	0	0	14	72	SSK
ASP	4	3	2	0	0	14	72	BNC
SGDA	2	9	3	0	0	14	86	SMK
M&SPE	4	7	2	1	0	14	72	SVM
EM&A	2	5	6	1	0	14	86	MSP

HOD
Electrical

P.E.S COLLEGE OF ENGINEERING

ELECTRONICS AND TELECOMMUNICATION

B.E RESULT ANALYSIS 2018-19

Sr.No.	Seat No.	Name of Student	NTK	MRR	APK	VVK	SSK	NTK	APK	APK	SSK	
			DIP	E.S	VLSID	M&RE	WMC	CCN	OFC	CE	SAT COMM	
1	428040013	Argade Sheetal	58	44	58	39	54	44	47	55	37	Fail
2	428040037	Bhamare Prashant	46	52	43	42	42	49	56	41	45	
3	428040052	Borde Gangotri	51	45	68	60	73	62	78	57	61	
4	428040065	Chavan Ganesh	66	78	62	59	61	67	70	61	56	
5	428040196	Khade Priti	53	73	47	60	62	61	74	56	62	
6	428040209	Kondke Vishal	45	60	55	45	64	48	54	51	60	
7	428040212	Kshirsagar Shivani	44	59	45	57	57	49	43	53	43	
8	428040260	Mhaske Dipali	48	63	67	57	54	54	58	61	48	
9	428040299	Pandhare Sunil	45	51	42	45	54	57	52	62	46	
10	428040317	Patil Sukanya	57	59	60	62	53	62	68	75	58	
11	428040343	Raut Sneha	57	61	48	61	50	60	82	49	63	
12	428040346	Rokade Shubhangi	45	47	69	54	48	56	68	52	64	
13	428040351	Sakhale Ajay	56	12	47	36	46	42	23	43	40	Fail
14	428040368	Shendge Ramesh	44	45	42	50	55	47	63	66	51	
15	428040377	Shoeb Ali	52	29	42	29	40	50	50	46	30	Fail
16	428040410	Thorat Pravin	57	44	48	43	60	65	55	69	48	
17	428040435	Wakode Supriya	46	65	47	50	44	62	53	66	53	
			100%	89%	100%	82%	100%	100%	94%	100%	88%	

Total students in class = 17

Total passed students = 14

Total Pass percentage = 82%

P.E.S. COLLEGE OF ENGINEERING

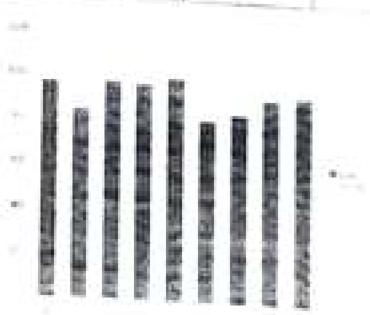
Mechanical Engineering Department

Result Analysis of [illegible]

Subject: All Subjects

Subject ↓ / Range →	0-24 No. of students	0-24 %age	25-27 No. of students	25-27 %age	28-47 No. of students	28-47 %age	48-80 No. of students	48-80 %age	Absent	Total Pass No. of students	Total Pass %age	Total Appeared No. of students	C.Pass
ICE	7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	90.57	[illegible]	9
ACS	8	15.09	0	0.00	30	56.60	14	26.42	1.00	[illegible]	83.02	52	9
MQC	2	3.77	0	0.00	35	66.04	15	28.30	1.00	[illegible]	94.34	52	9
TURBO	7	13.21	0	0.00	41	77.36	4	7.55	1.00	[illegible]	84.91	52	9
PPE	6	11.32	0	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AE	4	7.55	0	0.00	43	81.13	5	9.43	1.00	[illegible]	90.57	52	9
PMOR	13	24.53	0	0.00	29	54.72	10	18.87	1.00	[illegible]	73.58	52	9
RAC	[illegible]	[illegible]	0	[illegible]	32	60.38	16	30.19	1.00	48	90.57	52	9
IE	3	5.66	0	0.00	29	54.72	20	37.74	1.00	43	92.45	52	9

Sr. No.	subject	Result in %	NAME OF STAFF
1	ICE	90.57	Prof. M.T. Shidiqui
2	ACS	83.02	Prof. H.R. Ghan
3	MQC	94.34	Prof. S.S. Shinde
4	TURBO	84.91	Prof. A.A. Hashmi
5	PPE	86.79	Prof. A.A. Gawali
6	AE	90.57	Prof. M.T. Shidiqui
7	PMOR	73.58	Prof. S.S. Shinde
8	RAC	90.57	Prof. A.A. Hashmi
9	IE	92.45	Prof. P.J. [illegible]
10	0	0.00	



HEAD OF DEPARTMENT

Mechanical Engineering

[illegible]

P.E.S. COLLEGE OF ENGINEERING

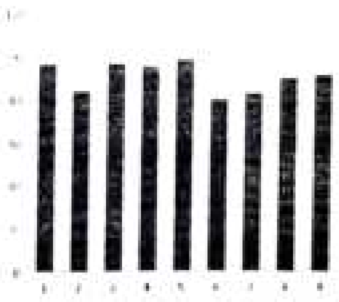
Mechanical Engineering Department

Result Analysis of BE- 2018-19

Total Number of Mark Sheets available =51   MARKSHEET T.Y.(UT) RECEIVED

Subject / All Subjects (Range →)	0-24		25-27		28-47		48-80		Absent	Total Pass		Total Appeared	CT<12
Subject ↓	No of students	%age	No. of students	%age	No. of students	%age	No. of students	%age		No. of students	%age	No. of students	
ICE	2	3.92	0	0.00	41	80.39	7	13.73	1.00	48	94.12	[illegible]	0
ACS	6	11.76	0	0.00	28	54.90	15	29.41	2.00	43	84.31		
MQC	2	3.92	0	0.00	41	80.39	7	13.73	1.00	48	94.12	[illegible]	0
TURBO	6	11.76	1	1.96	38	74.51	5	9.80	1.00	43	84.31	50	0
PPE	3	5.88	0	0.00	43	84.31	3	5.88	2.00	46	90.20	49	0
AE	2	3.92	0	0.00	41	80.39	6	11.76	2.00	47	92.16	49	0
PMOR	15	29.41	0	0.00	31	60.78	4	7.84	1.00	35	68.63	50	0
RAC	7	13.73	0	0.00	35	68.63	8	15.69	1.00	43	84.31	50	0
IE	1	1.96	0	0.00	34	66.67	15	29.41	1.00	49	96.08	50	0

Sr. No	subject	Result in %	NAME OF STAFF
1	ICE	94.12	Prof. G. G. Naik
2	ACS	84.31	Prof. A. M. Bawiskar
3	MQC	94.12	Prof. P. L. Pandit
4	TURBO	84.31	Prof. A. A. Hashmi
5	PPE	90.20	Prof. S. S. Shinde
6	AE	92.16	Prof. A. V. Thete
7	PMOR	68.63	Prof. Y. S. Sable and Prof. G. G. Naik
8	RAC	84.31	Prof. R. G. Pungle
9	IE	96.08	Prof. P. L. Pandit
10	0	0.00	



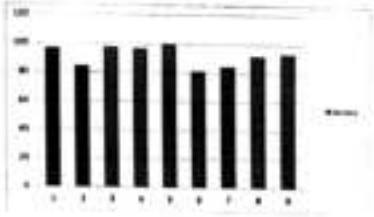
HEAD OF DEPARTMENT
Mechanical Engineering

Analysis of BE- A- 2018-19

Total Number of Mark Sheets available =51 MARKSHEET NOT RECIVED= 51

Subject / All Subjects / Range →	0-24		25-27		28-47		48-60		Absent	Total Pass		Total Appeared	CT<12
	No. of students	%age	No. of students	%age	No. of students	%age	No. of students	%age		No. of students	%age	No. of students	
ICE	2	3.92	0	0.00	41	80.39	7	13.73	1.00	48	94.12	50	0
ACS	6	11.76	0	0.00	28	54.90	15	29.41	2.00	43	84.31	49	0
MQC	2	3.92	0	0.00	41	80.39	7	13.73	1.00	48	94.12	50	0
TURBO	6	11.76	1	1.96	38	74.51	5	9.80	1.00	43	84.31	50	0
PPE	3	5.88	0	0.00	43	84.31	3	5.88	2.00	46	90.20	49	0
AE	2	3.92	0	0.00	41	80.39	6	11.76	2.00	47	92.16	49	0
PMOR	15	29.41	0	0.00	31	60.78	4	7.84	1.00	35	68.63	50	0
RAC	7	13.73	0	0.00	35	68.63	8	15.69	1.00	43	84.31	50	0
IE	1	1.96	0	0.00	34	66.67	15	29.41	1.00	49	96.08	50	0

Sr. No.	subject	Result in %	NAME OF STAFF
1	ICE	94.12	Prof. G.G.Naik
2	ACS	84.31	Prof.A.M.Bawiskar
3	MQC	94.12	Prof.P.L.Pandit
4	TURBO	84.31	Prof. A.A.Hashmi
5	PPE	90.20	Prof. S.S.Shirole
6	AE	92.16	Prof. V.V.Thete
7	PMOR	68.63	Prof. Y.S.Sable and Prof.G.G.Naik
8	RAC	84.31	Prof. R.G.Pungle
9	IE	96.08	Prof. P.L.Pandit



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Mechanical Engineering
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Mec[illegible]al Engineering
Result Analysis of BE- D- 2018-19

Subject : All Subjects — Total Number of Mark Sheets available = 53 — MARKSHEET NOT RECIVED= 53

Range → / Subject ↓	0-24		25-27		28-47		48-60		Absent	Total Pass		Total Appeared	CT<12
	No. of students	%age	No. of students	%age	No. of students	%age	No. of students	%age		No. of students	%age	No. of students	
ICE	4	7.55	0	0.00	42	79.25	6	11.32	1.00	48	90.57	52	0
ACS	8	15.09	0	0.00	30	56.60	14	26.42	1.00	44	83.02	52	0
MQC	2	3.77	0	0.00	35	66.04	15	28.30	1.00	50	94.34	52	0
TURBO	7	13.21	0	0.00	41	77.36	4	7.55	1.00	45	84.91	52	0
PPE	6	11.32	0	0.00	37	69.81	9	16.98	1.00	46	86.79	52	3
AE	4	7.55	0	0.00	43	81.13	5	9.43	1.00	48	90.57	52	3
PMOR	13	24.53	0	0.00	29	54.72	10	18.87	1.00	39	73.58	52	0
RAC	4	7.55	0	0.00	32	60.38	16	30.19	1.00	48	90.57	52	0
IE	3	5.66	0	0.00	29	54.72	20	37.74	1.00	49	92.45	52	3

Sr No.	subject	Result in %	NAME OF STAFF
1	ICE	90.57	Prof. M.T.Shirgan
2	ACS	83.02	Prof.H.R.Ghan
3	MQC	94.34	Prof.S.S.Shirole
4	TURBO	84.91	Prof. A.A.Hashmi
5	PPE	86.79	Prof. A.A.Gawali
6	AE	90.57	Prof. M.T.Shirgan
7	PMOR	73.58	Prof.S.S.Shirole
8	RAC	90.57	Prof. A.A.Hashmi
9	IE	92.45	Prof. P.L.Pandit

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Mechanical Engineering
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Aurangabad

Result Analysis of [illegible]

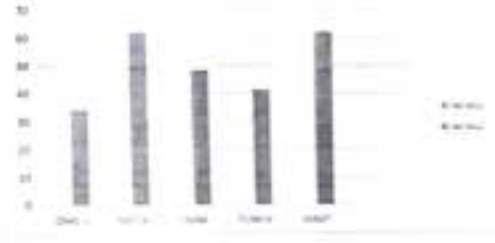
Sem-5th

Subject : All Subjects

Total Number of Mark Sheets available =34

Range / Subject	D		C		B		A		Absent	Total Pass		Total Appeared
	No. of students	%age	No. of students	%age	No. of students	%age	No. of students	%age		No. of students	%age	No. of students
DME-1	16	47.06	15	44.12	1	2.94	2	5.88	0.00	18	52.94	34
META	13	38.24	18	52.94	3	8.82	0	0.00	0.00	21	61.76	34
FMM	18	52.94	15	44.12	1	2.94	0	0.00	0.00	16	47.06	34
TOM-II	28	82.35	6	17.65	0	0.00	0	0.00	0.00	6	17.65	34
MMT	8	23.53	22	64.71	4	11.76	0	0.00	0.00	26	76.47	34

Sr. No.	subject	Result in %	Name of Staff
1	DME-1	52.94	Prof. Sable Y. S.
2	META	61.76	Prof. Pungle R. G.
3	FMM	47.06	Prof. Ali F. M.
4	TOM-II	17.65	Prof. Baisane V. P.
5	MMT	76.47	Prof. Shejwal V. D.



HEAD OF DEPARTMENT

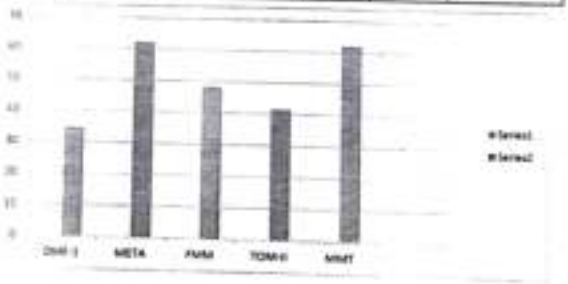
Result An[illegible]ils of TE -B -2018-19 CGPA
Sem 6th

Subject : All Subjects

Total Number of Mark Sheets available =34

Range / Subject	D		C		B		A		Absent	Total Pass		Total Appeared
	No. of students	%age	No. of students	%age	No. of students	%age	No. of students	%age		No. of students	%age	No. of students
DME-II	24	70.59	5	14.71	0	0.00	5	14.71	0.00	10	29.41	34
HT	25	73.53	6	17.65	2	5.88	1	2.94	0.00	9	26.47	34
TE	19	55.88	11	32.35	3	8.82	1	2.94	0.00	15	44.12	34
CAD/CAM	13	38.24	12	35.29	7	20.59	2	5.88	0.00	21	61.76	34
IHP	12	35.29	13	38.24	5	14.71	4	11.76	0.00	22	64.71	34

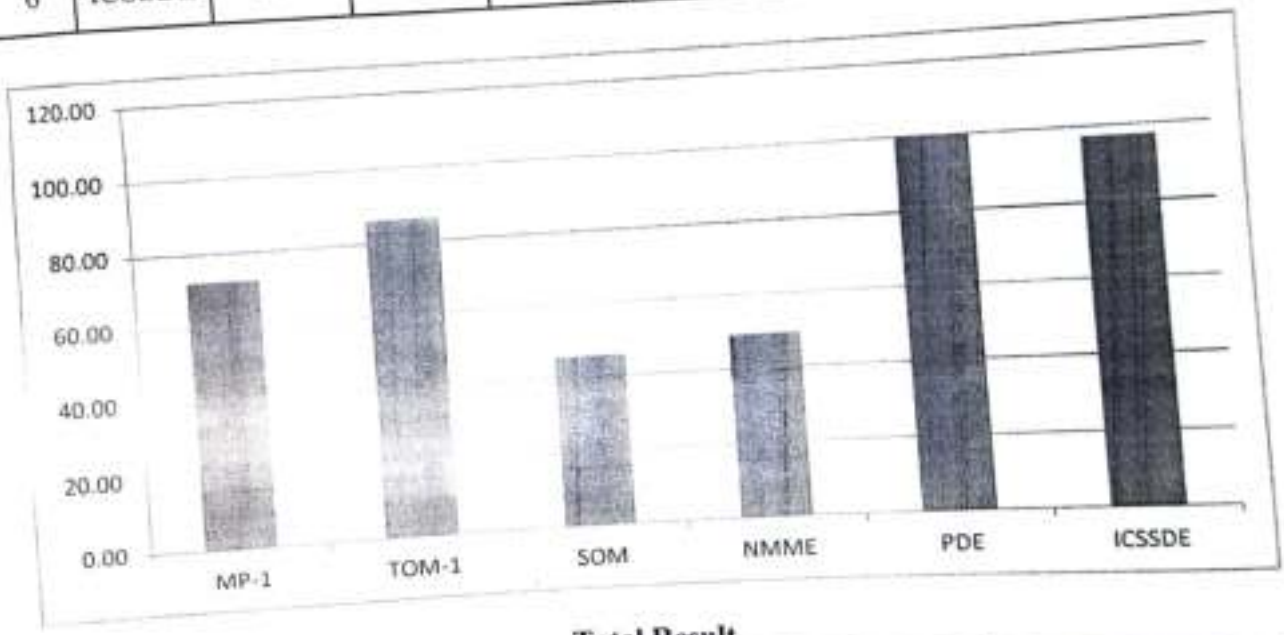
Sr. No.	subject	Result in %	Name of Staff
1	DME-II	29.41	Prof. Sable Y. S.
2	HT	26.47	Prof. Ali F. M.
3	TE	44.12	Prof. Tondchirkar M. G.
4	CAD/CAM	61.76	Prof. Shirsat R. L.
5	IHP	64.71	Prof. Ghan H. R.



HEAD OF DEPARTMENT
Mechanical Engineering
PES College of Engineering
Aurangabad

DR. Babasaheb Ambedkar Technological University, Lonere
P.E.S. College of Engineering Aurangabad
SY B-Tech Mechanical Engineering Summer Semester Exam 2019
Result Analysis

Sr No	Subject	Pass	Fail	Appear	Paasing Percentage	Subject Teacher
1	MP-1	84	32	116	72.41	Prof. H.R.Ghan & Prof.A.A.Gawali
2	TOM-1	100	16	116	86.21	Prof. A.M.Bawiskar Prof. V.P.Baisane
3	SOM	53	63	116	45.69	Prof. N.D. Dudhmal & Prof. A.R.Narwade
4	NMME	57	59	116	49.14	Prof. G.P.Kamble & Prof. S.N.Admankar
5	PDE	116	0	116	100.00	Prof. S.S.Shinde & Prof. S.S. Shirole
6	ICSSDE	113	3	116	97.41	Prof. R.L.Sirsat & Prof. M.N.Aves



Total Result

Class	Students Appeared	Promoted	Not Promoted	Percentage
SY MECH	116	71	45	61.20689655

HEAD OF DEPARTMENT
Mechanical Engineering
PES College of Engineering
Aurangabad

People Education Society's (Mumbai)

P. E. S. College of Engineering, Aurangabad

Department of Computer Science & Engineering

Program outcomes, program specific outcomes

PROGRAM OUTCOMES

After completing four year graduate course of BE (CSE) the students will be able to:

- Understand and proficiently apply the knowledge of mathematics, relevant sciences to CSE, to design software solutions to the given problems.
- An ability to design software & conduct their software simulations and testing to analyze and interpret the results produced and verify their online performance.
- Will be able to design a software automation system for various application areas using efficient algorithms, the computer resources and components, to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturing, and sustainability.
- Will be able to Design software projects for multidisciplinary applications areas and will be able to maintain it on field.
- An ability to identify, formulate the problem definitions for which the software solution can be designed and will be able to implement them.
- Will be able to demonstrate commitment by developing professional softwares for various applications as per ethical standards and rules led by society.
- Will be able to communicate with the corporate world effectively by implementing techniques for verbal and nonverbal communication skills taught in syllabus.
- The computer Graduate will be able to understand impact of software solutions in a global economic, environmental and social context.
- Will be able to design software solutions using recent algorithms and also continuously modify them as per the current needs of the society through lifelong learning and professional development.
- Will be able to demonstrate knowledge of contemporary issues.
- Show awareness of and ability to proficiently identify and apply project management tools and methodologies to the planning and execution of software projects leading to software.
- Will be able to plan and use computer resources and other systems efficiently.

P. E. S. College of Engineering, Aurangabad

Principal
P.E.S. College of Engineering
Aurangabad

Program Specific Outcomes

The Program Specific outcomes UG in CSE are:

After completing four year graduate course of BE (CSE) the student will be able to:

1) Understand and proficiently apply the knowledge of mathematics and relevant sciences and scientific methods to CSE, to design software solutions to given problems.
2) An ability to analyze the problem and identify & formulate the hardware, software, other computing requirements to design software solution for it.
3) Will be able to design a software automation system for various application areas using efficient algorithms, the computer resources and components, to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturing, and sustainability.
4) Will be able to Design software projects for multidisciplinary application areas and will be able to maintain it on field.
5) Modern Tool usage: An ability to select, modern software tools, apply appropriate software development methodologies, resources necessary for computing.
6) The engineer and the Society: The engineer will be able to apply the reasoning about local and global impact of software solutions for problems using contextual knowledge to assess societal, health, safety, legal and cultural issues.
7) Environment and sustainability: Understand the impact of software solutions and the need of sustainable development to save environment.
8) Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of software engineering practice.
9) Individual and team work: Will be able to function effectively as software engineer and also member or a leader of a software development team and also work on multidisciplinary projects.
10) Will be able to communicate effectively on complex engineering activities with the engineering community and with the society at large such as being able to comprehend and to write effective reports and design documentation make effective presentations and give and receive clear instructions.
11) Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles apply those to one's own work as a member and leader in a team to manage projects in multidisciplinary teams.
12) Recognize the need for and have the preparation and ability to engage in lifelong learning in the broadcast context of technical change.

P.E.S. College of Engineering

Principal
P.E.S. College of Engineering
Aurangabad

PES College of Engineering, Aurangabad.

Department of Electronics & Telecommunication Engineering

Program educational objectives

1. Graduates will able to succeed in positions in engineering practice or research, and in other fields they choose to pursue.
2. Graduates will become a responsible member of society.
3. Graduates will be leaders, both in their chosen profession and in other activities.
4. Graduates will address the complexities of real life engineering problems and be able to formulate solutions that are technically sound, economically feasible & sustainable.

PROGRAM OUTCOMES

Upon successful completion of this course it is expected that electronics graduate will be able to:

a. Understand and proficiently apply the relevant sciences & scientific methods to Electronics engineering to design solutions to complex problems in electronics systems, electronic circuits & control processes.

b. Identify, interpret & critically appraise current developments, advanced technologies and apply them to electronic engineering field to enhance reliability and efficiency of electronics based systems, components and programs.

c. Identify and synthesize the constraints posed by economic factors, safety considerations, environmental impacts and professional standards on Electronics engineering practices and use them for professional judgments in solving the critical field problems for sustainable technological development of nation.

d. Determine, analyze and proficiently apply theoretical and numerical analysis of Phenomenon to

conceive, control & optimize the performance of Electronics engineering systems used for different applications such as in navigation, automobiles, transportation, and automation.

e. Identify and critically evaluate the performance of a electronics engineering systems in terms of economics, safety, and social and physical environment and implement approaches to minimize any adverse impact leading to sustainable development of society.

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f. Understand and proficiently apply a systems approach for electronics system design and addressing the broad contextual constraints, leading to sustainable developments of global level electronics technologies and standards.

g. Show awareness and ability to proficiently apply project management tools and methodologies to the planning and execution of projects leading to electronics engineering solutions of professional standards.

h. Develop & implement creative and innovative approaches to enhance the reliability, efficiency and economical aspect of electronics systems for sustainable improvement of electronics technologies.

i. Communicate effectively on both technical and general issues with peers, associate, clients and the general public to find solutions using technical proficiency.

j Operate effectively and professionally within a team environment to solve complex problems of analyze, design and development of electronics systems.

k. Use all fundamental knowledge of electronics engineering, sciences and mathematics to plan, organize and use resources efficiently to reduce adverse effect on environments

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Department of Electrical Engineering

PROGRAM OUTCOMES: Upon successful completion of this course it is expected that electrical graduate will have ability to

- Apply the knowledge of science, mathematics and engineering to solve the problems related to electrical engineering.
- Identify, design and conduct the experiments to analyze and interpret data to verify the performance of electrical systems or equipment's.
- Design an electrical system, component or process to meet the desired IEPs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability using professional standards applicable in electrical engineering practice.
- Proficiently apply theoretical & numerical analysis to conceive, control & optimize the performance of multidisciplinary applications.
- To identify, formulate, and solve engineering problems in terms of economics, safety and the social and physical environment, and implement approaches to minimize any adverse impact leading to sustainable development of society.
- Understand professional and ethical responsibility.
- Communicate effectively on both technical and general issues with peers, associate, clients and the general public to find solutions using technical proficiency.
- Understand; proficiently apply a system approach for electrical system design and addressing the broad contextual constraints, leading to sustainable development of global level electrical technologies and standards.
- Recognition of the need for, and an ability to engage in research and to involve in lifelong learning.
- Knowledge of contemporary issues.
- Use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program specific Outcomes:

1)To create professional graduates in the field of electrical engineering with capability to apply the knowledge of Electrical engineering and to solve related problems.

2)To execute multi-disciplinary profiles through theoretical and numerical analysis conceive , control and optimize the system performance

.

3)To serve for the betterment of mankind in the society professionalty with ethics and moral responsibilities.

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Department of Civil Engineering

PROGRAM Objectives (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations.

4. **Conduct investigations of complex problems:** Use research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in society and environmental contexts, demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation make effective presentations and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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Department of Mechanical Engineering

Program Outcomes

At the end of the Program/Course the students will be able to

1. Apply the knowledge of Mathematics, Basic Sciences and Mechanical Engineering to formulate engineering problems
2. Identify, formulate and analyze complex Mechanical Engineering problems and give robust solution to them
3. Design, analyze and manufacture various mechanical systems and assemble them to make a project
4. Design, model and analyze various thermal systems
5. Select, create and apply modern mechanical engineering and IT Tools to complex Engineering activates with understanding of limitations.
6. Design, model, simulate and analyze various mechanical components using CAD/CAM/CAE
7. Visualize and to work on multi disciplinary projects
8. Acquire communication, leadership, entrepreneurship skills and implement the knowledge of professional ethical practices for the development of Society.
9. Understand the contemporary issues of the society and provide engineering solutions to them
10. Acquire skills and ability for lifelong learning
11. Understand the engineering and management principle and apply these to the multi disciplinary environment
12. Proficiently identify and apply project management and operation research methodologies for optimization of engineering problems

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P. E. S. College of Engineering, Aurangabad

Department of Computer Science & Engineering

Program outcomes, program specific outcomes

Course Outcomes:

Course	Course Outcomes
SE CSE PART-I BSH-201 Engineering Mathematics-III	1. Students will able to understand and proficiently apply the relevant sciences and scientific methods to Engineering Mathematics, to design solutions to complex problems. 2. Students will able to identify, interpret and critically appraise current developments and advanced technologies and apply them to Engineering Mathematics. 3. Students will able to determine analyses and proficiently apply theoretical and numerical analysis of phenomena to conceive, control and optimize the performance of Engineering Mathematics. 4. Students will able to develop and implement creative and innovative approaches to problem solving.
SE CSE PART-I DMS	1. Student will be able to formulate problems precisely and solve the problems. 2. Student will be able to apply formal proof techniques, and explain their reasoning clearly. 3. Students can analyze basics knowledge gained by mathematical logic and apply them. 4. Use algorithms for suitable applications
SE CSE PART-I CAO	1. To train the students with concept of microprocessor and computer architecture and organization. 2. To provide the knowledge of instruction set of 8086 and assembly programming. 3. To analyze the memory operations
SE CSE PART –II Computer Graphics	1. Student will be able to understand the basic graphics primitives. 2. Students will implement the graphical programming techniques to design structures and soft wares. 3. Student will be able to build interactive models with various transformations. 4. Student will be able to implement and analyze geometric algorithms.
SE CSE PART –II OOP using C++	1. Student will be able to understand the features of C++ supporting object oriented programming 2. Student will be able to understand the relative merits of C++ as an object oriented programming language 3. Student will be able to understand how to produce object-oriented software using C++ 4. Student will be able to understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism

TE CSE PART-I Course Code: CSE 301 Operating System	1. Will be able to define, formulate problem definitions for designing various modules of operating system. 2. Will be able to design the modules of operating system that meets the realistic constraints such as economic, environmental, health safety & sustainability. 3. The student will be able to analyze use of existing OS (platform independent feature of operating system software), as well as design the operating system for multidisciplinary application areas. 4. Will be able to analyze the impact of design of operating system on various aspects such as environmental, economic, social environment. 5. Will be able to develop the algorithms or modify the existing algorithms to solve the problems in current designs as per the need of application.
TE CSE PART-I Course Code: CSE302 Theory of computation	1. Student will be able to define, formulate problem definitions for designing machines 2. Student will be able to identify and formulate the problems in a Finite Automata and also verify the performance of a machine by giving the input. 3. Student will be able to design Regular Expression for multidisciplinary application areas 4. Student will be able to develop and implement creative and innovative approaches to problem solving 5. Student will be able to build the techniques and skills to design syntactically correct Regular Languages using Context Free Grammar 6. Student will be able to use the techniques and skills to design syntactically correct Regular Languages using Context Free Grammar 7. Student will be able to design TM for multidisciplinary application areas. 8. Student will be able to build the programming technique for Turing machine
TE CSE PART-I Course Code: CSE303 Database Management System	1. Will be able to define, formulate problem definitions for designing various modules database management system. 2. Will be able to design the database system that meets the realistic constraints such as Economic, Environmental, Health Safety, and Sustainability. 3. The student will be able to analyze existing databases for multidisciplinary application areas. 4. Student will be able will be able to analyze the impact of design of database system on various aspects such as environmental, economic, social environment. 5. Student will be able will be able to develop and modify the existing database systems to solve the 6. Student will be able understand problems in current designs as per the need of application. 7. Student will be able Plan, organize and use computer resources as well as manpower efficiently by developing efficient database applications. 8. Knowledge of contemporary issues. 9. Communicate effectively on both technical and general issues with peers, associates, 10. Clients and the general public to define the problem specification.

TE CSE PART-I Course Code: CSE304 Programming in Java	1. The students will be able to apply object oriented features to real time entities. 2. The students will be able handle exceptions & implement multithreaded programs. 3. The students will be able implement database programming. 4. The students will be able design & implement GUI with event handling 5. The students will be able develop I/O & networking programs.
TE CSE PART-I Computer Network Architecture & Protocols (Elective-I) Course Code: CSE341	1. To understand fundamental concepts of computer networking and functionality of layered network architecture. 2. To understand wireless and mobile networking concepts 3. To apply networking concepts to various situations, classifying networks, analysing performance of computer network infrastructure.
TE CSE PART-I Digital Image Processing (Elective-I) Course Code: CSE342	1. Students should be able to understand digital image processing beyond the fundamental level. 2. To study complete digital image processing steps. 3. Students should be able to choose appropriate image processing algorithm to achieve desired result. 4. Students should be able to properly implement DIP algorithms using modern computing tools Such as MATLAB, interpret and present the results.
TE CSE PART-II CSE352 Design and analysis of Algorithms	1. The student will be able to define, formulate problem definitions for designing algorithms. 2. The student will be able to understand the syntax and design algorithms. 3. The student will be able to use the various design methods and skills to solve the problem like TSP, Knapsack. 4. The student will be able to describe divide and conquer paradigm and explain when an algorithmic design situation calls for it. 5. Will be able to analyze graph algorithms and apply graph concept to model engineering problems. 6. Will be able to design the algorithm that meets the realistic constraints such as Economic, Time constraint, Space constraint 7. The student will be able to conclude which algorithmic method is better for given problem. 8. The student will be able to modify the existing algorithms to solve the problems in current designs as per the need of application.

TE CSE PART –II Software Engineering Course Code: CSE352	1. Will be able to use OOPS concepts, various computer architectures, languages for programming and UML to design software models. 2. Will be able to define, formulate & analyze the problem definition also hardware, software & other computing requirements to design a software solution for it. 3. Will be able to design software using software engineering phases to meet the desired needs of a client within the realistic constraints such as environmental ethical, economic, political, manufacturing, and sustainability. 4. Will be able to design software projects in various application areas like business, research, commercial, banking internet, mobile applications and maintain it. 5. Will develop the software as per software engineering standards, & rules led by the society. 6. Will be able to analyze the impact of software on world economy, social aspects. 7. Will be able to plan organize software development process so that computer resources efficiently.
TE CSE PART –II Advanced Java Course Code: CSE351	1. Develop skills in Enterprise Java 2. Understanding advanced concepts in Java Programming 3. Understanding importance of Service oriented Architecture of today's web application
BE CSE PART-I Principles of Compilers Design Course Code: CSE403	1. Will be able to define, formulate problem definitions for designing various types of compiler. 2. Will be able to design programs using LEX, YACC tools for multidisciplinary application areas and will be able to maintain it on field. 3. Will be able to use the techniques and skills to design a program by using compiler. 4. Will be able to identify and formulate the problems in a program and also verify the performance of a program. 5. Will be able to design the software program for various application areas using compiler construction tools, the computer resources and components, to meet the desired needs. 6. Will be able to develop and implement creative and innovative approaches to problem solving.
BE CSE PART-I Parallel and Distributed Computing Course Code: CSE402	1. Develop and apply knowledge of parallel and distributed computing techniques and methodologies. 2. Apply design, development, and performance analysis of parallel and distributed applications. 3. Use the application of fundamental Computer Science methods and algorithms in the development of parallel applications. 4. Explain the design, testing, and performance analysis of a software system, and to be able to communicate that design to others.
BE CSE PART-I Data Warehousing & Data mining Course Code : CSE401	1. To understand data warehouse 2. To understand and implement multidimensional model 3. To identify the problems, and apply mining algorithms 4. To describe the business intelligence (BI) methodology and concepts

BE CSE PART –I Visual Modelling Course Code: CSE404	1. Will be able to define, formulate & analyze the problem definition & also hardware, software & other computing requirements to design a software solution for it. 2. Will be able to design software using software engineering phases to meet the desired needs of a client within the realistic constraints such as environmental ethical, economic, political, manufacturing, and sustainability. 3. Will develop the software as per software engineering standards, & rules led by the Society 4. Will be able to analyze the impact of software on world economy, social aspects. 5. Will be able to plan organize software development process so that computer resources efficiently.
BE CSE PART –I Elective – I Cloud Computing Course Code: CSE441	1. To learn and understand Cloud Technologies 2. To design, develop and deploy Cloud applications 3. To get acquainted with the challenges and security aspects of Cloud Computing. 4. To study Mobile Cloud Applications
BE CSE PART –II Mobile Computing Course Code: CSE452	1. Students will demonstrate the use of languages and operating systems for mobile devices in a small development exercises. 2. They will have a good understanding of how the underlying wireless and mobile communication networks work, their technical features, and what kinds of applications they can support. 3. Critically analyze security issues of mobile and wireless computing system. 4. Understand current technologies and architectures that provide the network and communications infrastructure for mobile enabled computer systems. 5. Identify the appropriate development toolkits, IDE's and emulators for creating and publishing various mobile applications using WML and WML Script. 6. Develop and implement creative and innovative approaches to problem solving. 7. Communicate effectively on technical issues with clients.
BE CSE PART –II Green IT Course Code: CSE492	1. Explains what green IT is and examines the significance of green IT. 2. Discusses environmental concerns, global warming and the principles of sustainable development. 3. Discusses how data centers, cloud computing, storage systems, software and networks can be made greener. 4. Highlights how IT could help businesses in their environmental initiatives and reduce their carbon emissions. 5. Presents the drivers and benefits of energy-efficient computer networks and communications. 6. Describes energy-efficient networking solutions from the perspective of reduced carbon cost and improved operational sustainability. 7. Presents exemplar context data required for management systems with green objectives across domains. 8. Discusses current research and development on making cloud computing green 9. Outlines future research directions emphasizing holistic efforts needed to make clouds a viable and sustainable computing alternative.

BE CSE PART –II Computer System Security and Laws Course Code : CSE451	1. To understand the five security components and apply them when evaluating a given security mechanism. 2. To understand basic cryptography including symmetric and asymmetric cryptography, message digests, digital signatures and digital certificates. 3. To understand the basics of system security along-with the mechanisms for authentication and authorization. 4. To understand the legal aspect and Forensics in the computer system security.
BE CSE PART –II Soft Computing Course Code: CSE453	1. To understand the scope of soft computing and pattern recognition tasks that can be performed by some of the basic structures of artificial neural networks 2. Analyse feed forward networks and understand the significance of nonlinear output functions of processing unit in feedback network for pattern storage. 3. To describe and explain Core concepts and techniques of fuzzy logic. 4. To understand Fuzzy Logic in database System and information.
M. Tech FY Part 1 High Performance Computing (Elective 2) Sub Code: MTCE1105	1. To transform algorithms in the computational area to efficient programming code for modern computer architectures 2. To write, organize and handle programs for scientific computations 3. To create presentation of using tools for performance optimization and debugging 4. To present analysis of code with respect to performance and suggest and implement performance improvements 5. To present test cases to solve problems for multi-core or distributed, concurrent/Parallel environments.
M. Tech FY Part 2 Software Testing (Elective 3) Sub Code: MTCE1203	1. To ensures the quality of product by preventing and detecting the defect 2. To Verify and validate the user requirements by implementing testing strategies 3. To focus on accurate and reliable result by generating test cases 4. To provide information to take decision for next phase 5. To gain confidence of work by evaluating the capabilities of a system and system performance

Department of Electronics and Telecommunication

SY- ETC SEM-III

1. Analog Circuits (BTEXC302)

Course Objectives:

1. To understand characteristics of IC and Op-Amp and identify the internal structure.
2. To introduce various manufacturing techniques.
3. To study various op-amp parameters and their significance for Op-Amp.
4. To learn frequency response, transient response and frequency compensation
5. techniques for Op-Amp.
6. To analyze and identify linear and nonlinear applications of Op-Amp.
7. To understand functionalities of PLL.

Course Outcomes:

On completion of the course, students will be able to:

1. Understand the characteristics of IC and Op-Amp and identify the internal structure.
2. Understand and identify various manufacturing techniques.
3. Derive and determine various performances based parameters and their significance for Op-Amp.
4. Comply and verify parameters after exciting IC by any stated method.
5. Analyze and identify the closed loop stability considerations and I/O limitations.
6. Analyze and identify linear and nonlinear applications of Op-Amp.
7. Understand and verify results (levels of V & I) with hardware implementation.
8. Implement hardwired circuit to test performance and application for what it is being designed.

2. Electronic Devices & Circuits (BTEXC303)

Course Objectives:

1. To introduce semiconductor devices FET and MOSFET, their characteristics, operations, circuits and applications
2. To introduce concepts of both positive and negative feedback in electronic circuits
3. To analyze and interpret FET and MOSFET circuits for small signal at low and high frequencies
4. To simulate electronics circuits using computer simulation software and verify desired results
5. To study the different types of voltage regulators.

Course Outcomes:

On completion of the course, students will be able to:

1. Comply and verify parameters after exciting devices by any stated method.
2. Implement circuit and test the performance.
3. Analyze small signal model of FET and MOSFET.
4. Explain behavior of FET at low frequency.
5. Design an adjustable voltage regulator circuits.

3. Network Analysis (BTEXC304)

Course Objectives:

1. To learn about the basic laws of electric circuits as well as the key fundamentals of the communication channels, namely transmission lines.
2. To understand the need of simplification techniques of complicated circuits
3. To learn about the comprehensive insight into the principle techniques available for characterizing circuits, networks and their implementation in practice.
4. To learn about the use of mathematics, need of different transforms and usefulness of differential equations for analysis of networks.

5. To train the students for handling analog filter design through theory of NA along with practical, this is basic requirement of signal processing field.

Course Outcomes:

On completion of the course, students will be able to:

1. Apply knowledge of mathematics to solve numerical based on network simplification and it will be used to analyze the same.
2. Design passive filters and attenuators theoretically and practically. To apply knowledge for design of active filters as well as digital filters and even extend this to advance adaptive filters.
3. Identify issues related to transmission of signals, analyze different RLC networks.
4. Find technology recognition for the benefit of the society.

4. Digital Logic Design (BTEXC305)

Course Objectives:

1. To acquaint the students with the fundamental principles of two-valued logic and various devices used to implement logical operations on variables.
2. To lay the foundation for further studies in areas such as communication, VHDL, computer.

Course Outcomes:

On completion of the course, students will be able to:

1. Use the basic logic gates and various reduction techniques of digital logic circuit in detail.
2. Design combinational and sequential circuits.
3. Design and implement hardware circuit to test performance and application.
4. Understand the architecture and use of VHDL for basic operations and Simulate using simulation software.

5. Basic Human Rights (BTHM3401)

Course Objectives:

1. To work for ensuring that basic human rights are respected everywhere.
2. To cooperate to avoid compromising on human rights for economic or political expediency
3. To recognize democratic institutions as a fundamental human right
4. To work towards the sovereignty and self-determination of entities with historical, cultural and ecological identity.
5. To actively engage with the Government of India and other countries to promote human rights education.
6. To bring diplomatic and commercial pressures on regimes that violates human rights, to ensure that they respect the basic rights of their citizens.
7. To keep the interests of disempowered communities foremost in all dealings with countries in which human rights violations occur

8.To develop a more distinctive and effective role for the International Court of Justice in the field of human rights
9. To promote a culture for educating the citizenry that cultivation and promotion of human rights culture is the sine qua non for the smooth functioning of the organs of a democratic State and for the kind of development that results into overall development of the society.
10. To train the young men and women for facing the challenges of the pluralistic society and the rising conflicts and tensions in the name of particularistic loyalties to caste, religion, region and culture
11. To study the effects of draconian laws and unlawful use of State's machinery and force by the enforcement agencies.

Course Outcomes:

On completion of the course, students will be able to:

1. Simply put, human rights education is all learning that develops the knowledge, skills, and values of human rights.
2. Strengthen the respect for human rights and fundamental freedoms.
3. Enable all persons to participate effectively in a free society.
4. Learn about human rights principles, such as the universality, indivisibility, and interdependence of human rights.
5. Learn about regional, national, state, and local law that reinforces international human rights law.
6. Learn and know about and being able to use global, regional, national, and local human rights instruments and mechanisms for the protection of human rights

SY- ETC SEM-IV

1. Electrical Machines and Instruments (BTEXC401)

Course Objectives:

1. Model and Analyze the performance of different types of DC machines
2. Learn the applications of DC generators

3. Analyze the performance of different types of DC motors
4. Analyze the performance of different types of Sensors and Transducers
5. Familiarize with the applications of DC machines
6. To prepare students to perform the analysis of any electromechanical system.
7. To empower students to understand the working of electrical equipment used in everyday life.

Course Outcomes:

On completion of the course, students will be able to:

1. The ability to formulate and then analyze the working of any electrical machine using mathematical model under loaded and unloaded conditions.
2. The skill to analyze the response of any electrical machine.
3. The ability to troubleshoot the operation of an electrical machine.
4. The ability to select a suitable measuring instrument for a given application.
5. The ability to estimate and correct deviations in measurements due to the influence of the instrument and due to the accuracy of the instrument.

2. Analog Communication Engineering (BTEXC402)

Course Objectives:

1. To introduce the concepts of analog communication systems.
2. To equip students with various issues related to analog communication such as modulation, demodulation, transmitters and receivers and noise performance.
3. To understand the concepts of modulation and demodulation techniques of angle modulation (frequency and phase)

Course Outcomes:

On completion of the course, students will be able to:

1. Understand and identify the fundamental concepts and various components of analog communication systems.
2. Understand the concepts of modulation and demodulation techniques.
3. Design circuits to generate modulated and demodulated wave.
4. Equip students with various issues related to analog communication such as modulation, demodulation, transmitters and receivers and noise performance.
5. Understand the concepts of modulation and demodulation techniques of angle modulation (frequency and phase).
6. Explain signal to noise ratio, noise figure and noise temperature for single and cascaded stages in a communication system.
7. Develop the ability to compare and contrast the strengths and weaknesses of various communication systems.

3. Microprocessor (BTEXC403)

Course Objectives:

1. Objective of this course is to introduce to the students the fundamentals of microprocessor.
2. After learning Microprocessor course, students will get advantage to pursue higher

studies in Embedded Systems or employment in core industries.
3. The learner can design microprocessor based systems and thus can become successful entrepreneur and meet needs of Indian and multinational industries.
4. The students can design and develop processor which can be used in Robotics, Automobiles, Space and many research areas.
5. The learners will acquaint optimization skills and undergo concepts design metrics for embedded systems.
6. The students will get acquainted with recent trends in microprocessor like pipelining, cache memory etc.
7. To understand the applications of Microprocessors.
8. To learn interfacing of real world input and output devices.
9. To study various hardware and software tools for developing applications.

Course Outcomes:

1. Learner gains ability to apply knowledge of engineering in designing different case studies.
2. Students get ability to conduct experiments based on interfacing of devices to or interfacing to real world applications.
3. Students get ability to interface mechanical system to function in multidisciplinary system like in robotics, Automobiles.
4. Students can identify and formulate control and monitoring systems using microprocessors.
5. Students will design cost effective real time system to serve engineering solution for Global, social and economic context.
6. This course understanding will enforce students to acquire knowledge of recent trends like superscalar and pipelining and thus finds recognition of continuous updation.
7. Learn use of hardware and software tools.
8. Develop interfacing to real world devices.

4. Signals and Systems (BTEXC404)

Course Objectives:

1. To understand the mathematical description of continuous and discrete time signals and systems.
2. To classify signals into different categories.
3. To analyze Linear Time Invariant (LTI) systems in time and transform domains.
4. To build basics for understanding of courses such as signal processing, control system and communication.
5. To develop basis of probability and random variables.

Course Outcomes:

On completion of the course, students will be able to:
1. Understand mathematical description and representation of continuous and discrete time signals and systems.
2. Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system.
3. Understand and resolve the signals in frequency domain using Fourier series and Fourier transforms.

4. Understand the limitations of Fourier transform and need for Laplace transform and develop the ability to analyze the system in s- domain.
5. Understand the basic concept of probability, random variables & random signals and develop the ability to find correlation, CDF, PDF and probability of a given event.

4. Product Design Engineering (BTID405)

Course Objectives:

1.To acquaint the students with the fundamental principles of product.
2.The students will be exposed to hardware details of different Product
3.The students will be exposed to hardware details of product with the related signals and their implications.
4.To lay the foundation for further studies in different areas.

Course Outcomes:

At the end of the course, students will be able to

1. Create simple mechanical or other designs
2. Create design documents for knowledge sharing
3. Manage own work to meet design requirements
4. Work effectively with colleagues.

5. Numerical Methods and Computer Programming (BTBSC406)

Course Objectives:

1. To prepare students for successful career in industries, for Post Graduate programmes and to work in research institutes.
2. To understand different numerical techniques used for solving algebraic and transcendental equations.
3. To understand numerical methods to solve a system of linear equations.
4. To understand numerical integration and differentiation techniques.

Course Outcomes:

On completion of the course, students will be able to:

1. Able to solve algebraic and transcendental equations by using numerical techniques and will be able to compare different numerical techniques used for this purpose and also will be able to choose a proper one as per the requirement of the problem.
2. Able to solve a system of linear equations with any number of variables using different direct and iterative numerical techniques.
3. Understand the concept of interpolation, finite difference operators and their relations, and can apply different interpolation techniques on equi-spaced or non equi-spaced data values.
4. Prepare them to write computer programs for the numerical computational techniques.
5. Understand application of the NMCP course in many engineering core subjects like signal processing, digital communication, numerical techniques in electromagnetics etc.

6. Understand procedure-oriented and object oriented programming concepts.
7. Capable of writing C and C++ programs efficiently.

TY-ETC SEM-I

1. Electromagnetic Field Theory (BTEXC501)

Course Objectives:

1. Learners can be able to explore their knowledge in the area of EM Waves and its analysis.
2. To learn basic coordinate system, significance of divergence, gradient, curl and its applications to EM Waves.
3. To understand the boundary conditions for different materials /surfaces.
4. To get insight on finding solution for non-regular geometrical bodies using Finite Element Method, Method of Moments, Finite Difference Time Domain.
5. To get the basics of microwave, transmission lines and antenna parameters.
6. Students get acquainted with different physical laws and theorems and provide basic platform for upcoming communication technologies.

Course Outcomes:

At the end of this course students will demonstrate the ability to

1. Understand characteristics and wave propagation on high frequency transmission lines
2. Carryout impedance transformation on TL
3. Use sections of transmission line sections for realizing circuit elements
4. Characterize uniform plane wave
5. Calculate reflection and transmission of waves at media interface
6. Analyze wave propagation on metallic waveguides in modal form
7. Understand principle of radiation and radiation characteristics of an antenna.

2. Control System Engineering (BTEXC502)

Course Objectives:

1. To introduce the elements of control system and their modeling using various
2. Techniques.
3. To introduce methods for analyzing the time response, the frequency response and the
4. stability of systems.
5. To introduce the concept of root locus, Bode plots, Nyquist plots.
6. To introduce the state variable analysis method.
7. To introduce concepts of PID controllers and digital and control systems.
8. To introduce concepts programmable logic controller.

Course Outcomes:

At the end of this course, students will demonstrate the ability to

1. Understand the modeling of linear-time-invariant systems using transfer function and state-space representations.
2. Understand the concept of stability and its assessment for linear-time invariant systems.
3. Design simple feedback controllers

3. Computer Architecture (BTETC503)

Course Objectives:

1. To introduce basic concepts of computer organization and to illustrate the computer organization concepts by Assembly Language programming.
2. To understand operating systems and how they work with the computer and students will understand the relationship between hardware and software specifically how machine organization impacts the efficiency of applications written in a high-level language.
3. Students will be able to make use of the binary number system to translate values between the binary and decimal number systems, to perform basic arithmetic operations and to construct machine code instructions and students will be able to design and implement solutions for basic programs using assembly language.
4. Students will be able to design logical expressions and corresponding integrated logic circuits for a variety of problems including the basic components of a CPU such as adders, multiplexers, the ALU, a register file, and memory cells and to explain t fetch execute cycle performed by the CPU and how the various components of the data path are used in this process.

Course Outcomes:

At the end of this course students will demonstrate the ability to

1. learn how computers work
2. know basic principles of computer‟s working
3. analyze the performance of computers
4. know how computers are designed and built

4. Digital Signal Processing (BTEXC504)

Course Objectives:

1. • To introduce students with transforms for analysis of discrete time signals and systems.
2. • To understand the digital signal processing, sampling and aliasing.
3. • To use and understand implementation of digital filters.
4. • To understand concept of sampling rate conversion and DSP processor architecture.

Course Outcomes:

After successfully completing the course students will be able to

1. Understand use of different transforms and analyze the discrete time signals and systems.
2. Realize the use of LTI filters for filtering different real world signals.
3. Capable of calibrating and resolving different frequencies existing in any signal.
4. Design and implement multistage sampling rate converter.
5. Design of different types of digital filters for various applications.

5. Microcontroller and its Applications (BTEXC505)

Course Objectives:

1. Objective of this course is to introduce to the students the fundamentals of microcontroller.

2. After learning Microprocessor course, students will get advantage to pursue highe studies in Embedded Systems or employment in core industries.
3. The learner can microcontroller design based systems and thus can become successful entrepreneur and meet needs of Indian and multinational industries.
4. The students can design and develop processor which can be used in Robotics, Automobiles, Space and many research areas.
5. The learners will acquaint optimization skills and undergo concepts design metrics for embedded systems.
6. The students will get acquainted with recent trends in microcontroller like pipelining, cache memory etc.
7. To understand the applications of Microcontrollers.
8. To understand need of microcontrollers in embedded system.
9. To understand architecture and features of typical Microcontroller.
10. To learn interfacing of real world input and output devices.
11. To study various hardware and software tools for developing applications.

Course Outcomes:

1. Learner gains ability to apply knowledge of engineering in designing different case studies.
2. Students get ability to conduct experiments based on interfacing of devices to or interfacing to real world applications.
3. Graduates will be able to design real time controllers using microcontroller based system.

6. Probability Theory and Random Processes (BTEXPE506A)

Course Objectives:

1. To develop basic of probability and random variables.
2. The primary objective of this course is to provide mathematical background and sufficient experience so that the student can read, write, and understand sentences in the language of probability theory, as well as solve probabilistic problems in engineering and applied science.

Course Outcomes:

At the end of this course students will demonstrate the ability to

1. Understand representation of random signals
2. Investigate characteristics of random processes
3. Make use of theorems related to random signals
4. To understand propagation of random signals in LTI systems.

7. Introduction to MEMS (BTEXPE506D)

Course Objectives:

1. The objective of this course is to make students to gain basic knowledge on overview of

MEMS (Micro electro Mechanical System) and various fabrication techniques.

2. This enables them to design, analysis, fabrication and testing the MEMS based components and to introduce the students various opportunities in the emerging field of MEMS.
3. This will enables student to study applications of micro-sensors and micro-actuators, various MEMS fabrication technologies, MEMS-specific design issues and constraints, Dynamics and modeling of microsystems, getting access to fabrication and testing in academia and industry.

Course Outcomes:

At the end of the course the students will be able to
1. Appreciate the underlying working principles of MEMS and NEMS devices.
2. Design and model MEM devices.

TY-ETC SEM-II

1. Antennas and Wave Propagation (BTETC601)

Course Objectives:

1. To understand the applications of electromagnetic engineering.
2. To formulate and solve the Helmholtz wave equation and solve it for Uniform Plane Wave.
3. To analyze and understand the Uniform plane wave propagation in various media.
4. To solve the electric field and magnetic fields for a given wire antenna.

Course Outcomes:

After successfully completing the course students will be able to
1. Formulate the wave equation and solve it for uniform plane wave.
2. Analyze the given wire antenna and its radiation characteristics.
3. Identify the suitable antenna for a given communication system.

2. Computer Network & Cloud Computing (BTETC602)

Course Objectives:

1. To develop an understanding of modern network architectures from a design and performance perspective.
2. To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs).
3. To provide an opportunity to do network programming
4. To provide a WLAN measurement ideas.

Course Outcomes:

1. To master the terminology and concepts of the OSI reference model and the TCP-IP reference model.
2. To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.

3. To be familiar with wireless networking concepts.
4. To be familiar with contemporary issues in networking technologies.
5. To be familiar with network tools and network programming.
6. For a given requirement (small scale) of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) design it based on the market available component.
7. For a given problem related TCP/IP protocol developed the network programming.
8. Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.

3. Digital Image Processing (BTETC603)

Course Objectives:

1. An ability to use current techniques, skills, and tools necessary for computing practice with an understanding of the limitations

Course Outcomes:

2. After completion of this course students will be able to
3. 1. Review the fundamental concepts of digital image processing system.
4. 2. Analyze images in the frequency domain using various transforms.
5. 3. Categories various compression techniques.
6. 4. Interpret image segmentation and representation techniques.

4. Power Electronics (BTETPE604C)

Course Objectives:

1. To introduce students to different power devices to study their construction, characteristics and turning on circuits.
2. To give an exposure to students of working & analysis of controlled rectifiers for different loads, inverters, DC choppers, AC voltage controllers and resonant converters.
3. To study the different motor drives, various power electronics applications like
4. UPS, SMPS, etc. and some protection circuits.

Course Outcomes:

At the end of this course students will demonstrate the ability to
1. Build and test circuits using power devices such as SCR
2. Analyze and design controlled rectifier, DC to DC converters, DC to AC inverters,
3. Learn how to analyze these inverters and some basic applications.
4. Design SMPS.

5. Digital System Design (BTETOE605A)

Course Objectives:

1. The concept and theory of digital Electronics are needed in almost all electronics and telecommunication engineering fields and in many other engineering and scientific disciplines as well.

2. The main objective of this course is to lay the foundation for further studies in areas such as communication, VLSI, computer, microprocessor etc. One of the most important reasons for the unprecedented growth of digital electronics is the advent of integrated circuit.

3. This course will explore the basic concepts of digital electronics.

Course outcomes:

At the end of this course students will demonstrate the ability to

1. Design and analyze combinational logic circuits
2. Design & analyze modular combinational circuits with MUX/DEMUX, Decoder, Encoder
3. Design & analyze synchronous sequential logic circuits
4. Use HDL & appropriate EDA tools for digital logic design and simulation.

6. Employability & Skill Development (BTHM606)

Course Objectives:

1. To develop analytical abilities.
2. To develop communication skills.
3. To introduce the students to skills necessary for getting, keeping and being successful in a profession.
4. To expose the students to leadership and team-building skills.

Course Outcomes:

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

1. Have skills and preparedness for aptitude tests.
2. Be equipped with essential communication skills (writing, verbal and non-verbal)
3. Master the presentation skill and be ready for facing interviews.
4. Build team and lead it for problem solving.

7. Digital Communication (BTETC701)

Course Objectives:

1. To understand the building blocks of digital communication system.
2. To prepare mathematical background for communication signal analysis.
3. To understand and analyze the signal flow in a digital communication system.
4. To analyze error performance of a digital communication system in presence of noise and other interferences.
5. To understand concept of spread spectrum communication system.

Course Outcomes:

1. Analyze the performance of a baseband and pass band digital communication system in
terms of error rate and spectral efficiency.

2. Perform the time and frequency domain analysis of the signals in a digital communication
system.
3. Select the blocks in a design of digital communication system.
4. Analyze Performance of spread spectrum communication system.

BE-ETC (BAMU Structure) SEM-I

1. Digital Image Processing

Course Outcomes:

After learning the course the students should be able to:
1.Understand the basic image enhancement techniques in spatial & frequency domains.
2.Understand the various kind of noise present in the image and how to restore the noisy image.
3.Understand the basic multiresolution techniques and segmentation methods.
4.Apply different image processing concepts for image handling in various fields.
5.Apply various compression standards studied, reducing the image size for optimizing storage and transmission bandwidth in their image processing related projects.
6.Work as a team leader to work on complex projects in a project team environment

2. Very Large Scale Integration Design

Course Objectives

1. To learn basic CMOS Circuits.
2. To learn CMOS process technology.
3. To learn techniques of chip design using programmable devices.
4. To learn the concepts of designing VLSI Subsystems.
5.Understand the concepts of Physical Design Process such as partitioning, Floorplanning, Placement and Routing.
6.Discuss the concepts of design optimization algorithms and their application to physical design automation.
7.Understand the concepts of simulation and synthesis in VLSI Design Automation

Course Outcome

1. Identify the various IC fabrication methods.
2. Express the Layout of simple MOS circuit using Lambda based design rules.
3. Apply the Lambda based design rules for subsystem design
4. Differentiate various FPGA architectures.
5. Design an application using Verilog HDL.
6. Concepts of modeling a digital system using Hardware Description Language.

7. Students are able to know how to place the blocks and how to partition the blocks while for designing the layout for IC.

8. Students are able to solve the performance issues in circuit layout.

9. Students are able to analyze physical design problems and Employ appropriate automation algorithms for partitioning, floor planning, placement and routing

10. Students are able to decompose large mapping problem into pieces, including logic optimization with partitioning, placement and routing

3. Microwave & Radar Engineering

Course Outcomes:

The student after undergoing this course will be able to:

1. Explain different types of waveguides and their respective modes of propagation.
2. Analyze typical microwave networks using impedance, admittance, transmission and scattering matrix representations.
3. Design microwave matching networks using L section, single and double stub and quarter wave transformer.
4. Explain working of microwave passive circuits such as isolator, circulator, Directional couplers, attenuators etc.
5. Describe and explain working of microwave tubes and solid state devices.
6. Perform measurements on microwave devices and networks using power meter and VNA.
7. Explain the operation of RADAR systems and recite their applications.

4. Advanced Embedded System

Course Outcomes

Upon successful completion of this course it is expected that student will be able to

1. Understand fundamentals of embedded systems, design paradigms, architectures, possibilities and challenges, both with respect to software and hardware.
2. Practically apply gained theoretical knowledge in order to design, analyze and implement embedded systems, e.g. integrating embedded su00bsystems and applications.
3. Analyze a system both as whole and in the included parts, to understand how these parts interact in the functionality and properties of the system.

5. EL-I Wireless Mobile Communication

Course Outcomes:

Upon successful completion of this course students are able to

1. Discuss the cellular system design and technical challenges.
2. Explain classification of mobile communication system.
3. Analyze the mobile radio propagation, diversity concepts, fading and channel modeling.
4. Develop ability to analyze improved data services in cellular communication.

BE-ETC (BAMU Structure) SEM-II

1. Computer Networks & Security

Course Outcomes:

At the end of the course, the student will be able to

1. Able to know basic concepts of computer, computer communication and use of it in networking.
2. Able to know basics of Networking with different switching techniques.
3. Study of Networking topologiges: Mesh and Bus toplogy, Star topology & ring Topology.
4. Network Software : device driver for network interface card, LAN, MAN, WAN.
5. Overview of Network model: ISO-OSI and TCP/IP network reference Model.

2. EL-II (Fiber Optic Communication)

Course Objectives

1. To List the components optical fiber transmission link, block diagram .
2. To develop elements of an optical fiber transmission link, block diagram, advantages of optical fiber communication.
3. Understand and explain the Ray theorytransmission, total internal reflection acceptance angle, numerical aperture and skew rays understanding optical fiber communication, applications and evolution of fiber optic systems,
4. Understand the Ray theory transmission
5. To Distinguish internal reflection acceptance angle, numerical aperture and skew raysspecify their use
6. To List optical fiber communication, applications
7. To Explain Modes, electromagnetic mode theory and propagation l (U)
8. To Contrast and compare single mode and multimode fibers, linearly polarized modes

Course Outcome

After completion of the course, the student is able to

1. Distinguish Step Index, Graded index fibers and compute mode volume.
2. Explain the Transmission Characteristics of fiber and Manufacturing techniques of fiber/cable.
3. Classify the construction and characteristics of optical sources and detectors.

4. Discuss splicing techniques, passive optical components and explain noise in optical system.
5. Design short haul and long haul Analog/ Digital optical communication system and explain advanced optical transmission systems.

3. Antenna Theory

Course Objectives

Student will learn and understand

1. Fundamental antenna parameters and numerical methods to analyze and differentiate the antennas.
2. Concept of radiation mechanism of various antennas.
3. Mechanism and models for radio-wave propagation.

Course Outcomes

On completion of this course, the students will be able to

1. Identify basic antenna parameters.
2. Design and analyze antenna arrays.
3. Design and analyze wire and aperture antennas.
4. Identify the characteristics of radio-wave propagation.

4. Wireless Mobile Communication

Course Outcomes

1. Students will be able to discuss the cellular system design and technical challenges.
2. Students will be able to analyze the Mobile radio propagation, fading, diversity concepts and the channel modeling.
3. Students will be able to analyze the design parameters, link design, smart antenna, beam forming and MIMO systems.
4. Students will be able to analyze Multiuser Systems, CDMA, WCDMA network planning and OFDM Concepts.
5. Students will be able to summarize the principles and applications of wireless systems and standards

PES College of Engineering

Department of Electrical Engineering

Subject wise course Outcomes

Academic Year 2019-20

First Year

Course Name: Basic Electrical Engineering

	Students will be able
CO1	**To study basics of electrical engineering**
CO2	**To study basics of DC and AC electrical circuits**
CO3	**To study electromagnetism**
CO4	**To study transformer**

Second Year

Course Name: NETWORK ANALYSIS AND SYNTHESIS.

	Students will be able
CO1	**To review basic components of electric network.**
CO2	**To design and develop network equations and their solutions.**
CO3	**To apply Laplace theorem for electric network analyses**
CO4	**To analyze AC circuit.**

Course Name: FLUID MECHANICS AND THERMAL ENGINEERING.

	Students will be able
CO1	**To introduce properties of fluid and hydraulic measurement**
CO2	**To understand dynamics of fluid flow**
CO3	**To understand basic concepts of IC engines**
CO4	**To understand concept of refrigeration and air conditioning**

Course Name: MEASUREMENT AND INSTRUMENTATION

	Students will be able
CO1	**To understand philosophy of measurement.**
CO2	**To understand different methods analog and digital measurement**
CO3	**To study principle of construction and operation of different transducer and dismay methods**

Course Name: Basic Human Rights

	Students will be able

CO1	**To understand fundamental rights**
CO2	**To understand basic human rights**

Course Name: ENGINEERING ECONOMICS

	Students will be able
CO1	**To study concept of time value of money**
CO2	**To study about demand in detail**
CO3	**To understand Meaning of Production and factors of production,**
CO4	**To understand dif. Concept about market**

Course Name: ELECTRICAL ENGINEERING MATERIALS.

	Students will be able
CO1	**To study about crystal structure**
CO2	**To understand magnetic material structure**
CO3	**To study about conducting and superconducting materials**
CO4	**To study dielectric and nano materials.**

Course Name: ELECTRICAL MACHINES – I

	Students will be able
CO1	**To study diff. types, construction and operating principle of diff. types of electrical machines**
CO2	**To study the transformer and its applications**
CO3	**To study the performance of DC motors and its applicaitons**
CO4	**To study DC generator**

Course Name: POWER SYSTEM-I

	Students will be able
CO1	**To Understand basic operation of power system, power system components and their characteristics.**
CO2	**TO understand different power plants**

Course Name: ELECTRICAL INSTALLATION AND ESTIMATION

	Students will be able
CO1	**To prepare estimation and costing of electrical installations of power system,**
CO2	**To understand procedures of contracting and purchase.**

Cou Course Name: NUMERICAL METHODS AND PROGRAMMING.

	Students will be able
CO1	**To study and understand MATLAB programming.**
CO2	**To review mathematical concepts .**
CO3	**To develop computer program for linear and nonlinear equations.**

Course Name: Product Design Engineering

	Students will be able to
CO1	Create simple mechanical or other designs
CO2	Create design documents for knowledge sharing
CO3	Manage own work to meet design requirements
CO4	Work effectively with colleagues

Course Name: SOLID STATE DEVICES.

	Students will be able
CO1	**To study construction and characteristics of solid state devices.**
CO2	**To apply operational amplifier models in circuits employing negative feedback.**
CO3	**To design electronics circuit using Timer IC and voltage regulators.**
CO4	**To perform analysis of amplifiers using small signal models for the circuit elements.**
CO5	**To calculate the frequency response of circuits containing BJT, Op-Amp etc**

Course Name: ANALOG AND DIGITAL ELECTRONICS

	Students will be able
CO1	**To review basic number system.**
CO2	**To understand deign and characteristics of digital logic gates.**
CO3	**To study different techniques in use of digital circuits.**
CO4	**To design**

Course Name: INTRODUCTION TO NON-CONVENTIONAL ENERGY SOURCES,

	Students will be able
CO1	**To understand basic concepts , construction and operational features of nonconventional energy sources**
CO2	**To review the energy scenario**
CO3	**To study the solar ,wind energy and its practical applicaitons**

Third Year

Course Name: Electrical Machines -II

	Students will be able
CO1	**To study different methods of speed control of AC and DC motor**
CO2	**To study importance and procedure of different performance test on AC and DC motor.**
CO3	**To determine different different operating characteristics of AC and DC machines**

Course Name: POWER SYSTEM-II

	Students will be able
CO1	**To study different parameters of power system operation and control**
CO2	**To study load flow and Diff. methods of reactive power control.**
CO3	To understand different methods of fault analysis and stability study

Course Name: MICROPROCESSOR AND MICRO CONTROLLER

	Students will be able
CO1	**To know the architecture of 8085 and 8051.**
CO2	**To understand interfacing and interrupt features of 8085 and 8051.**
CO3	**To develop program for basic applications.**

Course Name: VALUE EDUCATION, HUMAN RIGHTS AND LEGISLATIVE PROCEDURES

	Students will be able
CO1	**To understand value of education and self-development**
CO2	**To develop good values and character**
CO3	**To know Human right and legislative procedure**

Course Name: ADVANCES IN RENEWABLE ENERGY SYSTEMS

	Students will be able
CO1	**To know the principle of energy conversion technique from biomass, geothermal and**
CO2	**hybrid energy systems.**
CO3	**To understand effects of air pollution and ecosystems**

Course Name: POWER PLANT ENGINEERING.

	Students will be able
CO1	**To review basic components of power system, energy sources.**
CO2	**To understand principle of construction and operation of different conventional power**
	plants.

Course Name: PRINCIPLES OF ELECTRICAL MACHINE DESIGN

	Students will be able
CO1	**To understand principles of electric machine design.**
CO2	**To design different components of electric machine.**
CO3	**To design Transformer**
CO4	**To understand CAD and use it for transformer design**

Course name: power electronics

	Students will be able
CO1	understand various basic Power Electronics devices.
CO2	understand application of Power Electronics devices in electrical power systems
CO3	understand control of Electrical Motors through DC-DC converters, AC Converters.
CO4	understand the use of Inductors and Capacitors in Choppers, Inverters and Converters

Course Name: INDUSTRIAL AUTOMATION AND CONTROL

	Students will be able
CO1	**To understand construction and working principle of different industrial measurement systems**
CO2	**To understand new trends in industrial process control.**

Course Name: SWITCH GEAR AND PROTECTION

	Students will be able
CO1	**To understand principles of protective relaying.**
CO2	**To understand principle of construction, operation and selection of different circuit breaker used in power system**
CO3	**To understand different protection schemes used in power system operation**

Course Name: . PROJECT MANAGEMENT

	Students will be able
CO1	**To understand concepts of project management.**
CO2	**To develop a project plan.**
CO3	**To understand the project implementation strategy.**
CO4	**To analyze post project affects.**

Course Name: Control System Engineering

	Students will be able
CO1	Student will be able to understand the role of control system in advanced society's acting as a catalyst for performing progress and development.
CO2	Student will be able to apply the knowledge of mathematics, basic operation of any system and mechanism.
CO3	The student will be able to optimize the control system design in economical and efficient design procedure
CO4	Student will be able to manipulate the selected data in such a way to that the given goal can be achieved optimally and efficiently.

CO5	Student will be able to analyze the time response and frequency response of the system for developing innovative and creative approaches to enhance the reliability and efficiency of electrical systems.
CO6	Student will be able to use their control system skills to plan, design and response to technical needs for industry, government and research.

Final Year

Course Name: POWER SYSTEM OPERATION AND CONTROL

	Students will be able to
CO1	Explain the fundamental concept of power system.
CO2	Design the mathematical model of synchronous machine.
CO3	Design the mathematical model Excitation system and speed governing system.
CO4	Analyze the transient stability of power system using swing equation and equal area criteria
CO5	Analyze the economic operation of power system.
CO6	Explain the methods of Voltage control.

Course Name: High Voltage Engineering

	Students will be able to
CO1	Illustrate the concept of electric field stresses, applications of insulating materials and methods for Non-destructive testing of equipment like transformers, insulators, isolators, bushings, lightning arrestors, cables, circuit breakers and surge diverters.
CO2	Explain the breakdown process in solid, liquid, and gaseous materials
CO3	Analyze methods for generation and measurement of High Voltages and Currents (both ac and dc)
CO4	Describe the phenomenon of over-voltage and choose appropriate insulation co-ordination levels based on IS & IEC Standards

Course Name: Electrical Drives

	Students will be able to
CO1	Analyze the dynamics of Electrical Drives system.
CO2	Use various control techniques for controlling the speed of AC and DC motors.
CO3	Analyze the AC and DC drives.
CO4	To Select/recommend the appropriate Drive according to the particular applications.
CO5	State the recent technology of AC and DC drive

Course Name: Power system protection

	Students will be able to
CO1	Understand the different types of circuit breakers and relays
CO2	Understand the applications of relays in power system
CO3	Understand the protection of different components of power system

Course Name: Digital Signal Processing

	Students will be able to
CO1	Represent signals, systems and digital processing of analog signals.
CO2	Represent discrete time signals, systems and analysis of Discrete-Time Linear Time- Invariant Systems.
CO3	Apply digital signal processing techniques to analyze discrete time signals in time domain.
CO4	Apply digital signal processing techniques to analyze discrete time signals in frequency domain
CO5	Design different filter structure
CO6	Validate system functionality and evaluate results

Course Name: Flexible AC transmission

	Students will be able to
CO1	Understand the different types of converts
CO2	Understand the different controllers and regulators
CO3	Understand the compensators

Course Name: RENEWABLE ENERGY

	Students will be able
CO1	**To know the principle of energy conversion technique from biomass, geothermal and**
CO2	**hybrid energy systems.**
CO3	**To understand effects of air pollution and ecosystems**

P.E.S. College of Engineering

Nagsenvan, Aurangabad

Department of Civil Engineering

1.1. Course Outcomes (COs)

1) Course Name:- BTCVC302Mechanics of Solids Year of Study:- 2019-20

1) Perform the stress-strain analysis.
2) Draw force distribution diagrams for members and determinate beams.
3) Find deflections in determinant beams.
4) Visualize force deformation behavior of bodies.

2) Course Name:- BTCVC303 Hydraulics I

1: Calibrate the various flow measuring devices.
2: Determine the properties of fluid and pressure and their measurement.
3: Understand fundamentals of pipe flow, losses in pipe and analysis of pipe network.
4: Visualize fluid flow phenomena observed in Civil Engineering systems

3) Course Name:- **BTCVC304 Surveying – I**

1: Perform measurements in linear/angular methods.
2: Perform plane table surveying in general terrain.
3: Know the basics of leveling and theodolite survey in elevation and angular measurements.

4) Course Name:- BTCVC305 Building Construction

1: Understand types of masonry structures.
2: Understand composition of concrete and effect of various parameters affecting strength.
3: Comprehend components of building and there purposes.
4: Comprehend the precast and pre-engineered building construction techniques.

5) Course Name:- BTCVC306Engineering Geology.

1: Recognize the different land forms which are formed by various geological agents.
2: Identify the origin, texture and structure of various rocks and physical properties of mineral.
3: Emphasize distinct geological structures which have influence on the civil engineering structure.
4: Understand how the various geological conditions affect the design parameters of structures.

6) Course Name:- BTCVC401Hydraulics II

1: Design open channel sections in a most economical way.
2: Know about the non-uniform flows in open channel and the characteristics of hydraulic jump.
3: Understand application of momentum principle of impact of jets on plane.

7) Course Name:- BTCVC402Surveying – II

1: Understand basics different types of curves on roads and their preliminary survey.
2: Perform setting of curves, buildings, culverts and tunnels.
3: Comprehend different geodetic methods of survey such as triangulation, trigonometric leveling.
4: Comprehend modern advanced surveying techniques.

8) Course Name:- BTCVC403Structural Mechanics – I.

1: Describe the concept of structural analysis, degree of indeterminacy.
2: Calculate slopes and deflection at various locations for different types of beams.
3: Identify determinate and indeterminate trusses and calculate forces in the members of trusses Perform the distribution of the moments the in continuous beam and frame.

9) Course Name:- BTCVE404A Numerical Methods in Engineering

1: Demonstrate the nuances of management functions.
2: Analyze the framework of a business organization.
3: Adopt an empirical approach toward business situations.
4: Apply various Management techniques.

10) Course Name:- BTCVC 501 Design of Steel Structures

1: Identify and compute the design loads and the stresses developed in the steel member.
2: Analyze and design the various connections and identify the potential failure modes.
3: Analyze and design various tension, compression and flexural members.
4: Understand provisions in relevant BIS Codes.

11) Course Name:- BTCVC 502 Structural Mechanics-II

1: Have a basic understanding of matrix method of analysis and will be able to analyze the determinant structure.
2: Have a basic understanding of the principles and concepts related to finite difference and finite element methods
3: Have a basic understanding of concept of influence line.

12) Course Name:- BTCVC 503 Soil Mechanics

1: Understand different soil properties and behavior
2: Understand stresses in soil and permeability and seepage aspects.
3: Develop ability to take up soil design of various foundations.

13) Course Name:- BTCVC 504 Environmental Engineering

1: Apply the water treatment concept and methods.
2: Prepare basic process designs of water and wastewater treatment plants.
3: Apply the wastewater treatment concept and methods.
4: Apply the solid waste management concepts.

14) Course Name:- BTCVC 505 Transportation Engineering.

1. Comprehend various types of transportation systems and their history of the development
2. Comprehend to various types of pavements
3. Design the pavements by considering various aspects associated with traffic safety measures.

15) Course Name:- BTCVE506A Materials, Testing &Evaluation

1. To develop skill among students to construct strong and durable structures by applying knowledge of material science.
2. To make the students aware of quality assurance and control in their real life as a professional.

16) Course Name:- BTCVE506C Development Engineering.

1. To develop multi scaled perspective about decisions in the built environment,
2. To expose the students to the analysis and evaluation of real world problems aiming to bring desired change in the society.

17) Course Name:- BTCVC601Design of Concrete Structures – I

1. Comprehend to the various design philosophies used for design of reinforced concrete.
2. Analyze and design the reinforced concrete slab using limit state and working state method.
3. Analyze and design the reinforced concrete beam using limit state and working state method.
4. Analyze and design the reinforced concrete column using limit state and working state method.

18) Course Name:- BTCVC602Foundation Engineering

1. To predict soil behavior under the application of loads and come up with appropriate solutions to foundation design queries.
2. Analyze the stability of slope by theoretical and graphical methods.
3. Analyze the results of in-situ tests and transform measurements and associated uncertainties into relevant design parameters.
4. Synthesize the concepts of allowable stress design, appropriate factors of safety, margin of safety, and reliability.

19) Course Name:- BTCVC603Concrete Technology

1: Understand the various types and properties of ingredients of concrete.
2: Understand effect of admixtures on the behavior of the fresh and hardened concrete.
3: Formulate concrete design mix for various grades of concrete.

20) Course Name:- BTCVC604Project Management

1. Understand various steps in project Management, different types of charts.
2. Construct network by using CPM and PERT method.
3. Determine the optimum duration of project with the help of various time estimates.
4. Know the concept of engineering economics, economic comparisons, and linear break even analysis problems.
5. Understand the concept of total quality Management including Juran and Deming's philosophy.

21) Course Name:- BTCVC606Building Planning and Design

1. To plan buildings considering various principles of planning and bye laws of governing body.
2. Comprehend various utility requirements in buildings.
3. Understand various techniques for good acoustics.

22) Course Name:- BTCVE605AWaste Water Treatments

1. Determine the sewage characteristics and design various sewage treatment plants.
2. Understand municipal water and wastewater treatment system design and operation.
3. Apply environmental treatment technologies and design processes for treatment of industrial waste water.
4. Understand the rural sanitation schemes.

23) Course Name:- BTCVE605DAdvanced Engineering Geology

1) Understand geological time scale and physiographic division of India and their geological characteristics and different
geological formation in India.
2) Perform sub surface exploration and interpret core log.
3) Solve numerical problem based on core drilling and seismic data.
4) Familiar with origin of earthquake, seismic wave and landslide in Deccan trap.

24) Course Name:- BTCVE 605E Advanced Soil Mechanics.

1: Behavior of soil based on its particle size and mineral content
2: Ability to understand the Earth work equipment
3: Ability to understand the necessity of ground improvement and potential of a ground for improvement
4: Understand the soil reinforcement mechanisms
5: Understand the grouting and injection methods.

25) Course Name:- BTCVC 701 Design of Concrete Structures II

1. Able to identify the behavior, analyze and design of the beam sections subjected to torsion.
2. Able to analyze and design of axially and eccentrically loaded column and construct the interaction diagram for them.
3. Understand various concepts, systems and losses in pre-stressing.
4. Able to analyze and design the rectangular and symmetrical I-section pre-stressed beam/girders.

26) Course Name:- BTCVC 702Infrastructure Engineering

1. Know about the basics and design of various components of railway engineering
2. Understand the types and functions of tracks, junctions and railway stations.
3. Know about the aircraft characteristics, planning and components of airport
4. Understand the types and components of docks and harbors.

27) Course Name:- BTCVC 703Water Resources Engineering

1: Understand need of Irrigation in India and water requirement as per farming practice in India.
2: Understand various irrigation structures and schemes.
3: Develop basis for design of irrigation schemes.

28) Course Name:- BTCVC 704 Professional Practices

1. Understand the importance of preparing the types of estimates under different conditions for various structures.
2. Know about the rate analysis and bill preparations and to study about the specification writing.
3. Know the various types of contract, accounts in PWD, methods for initiating the works in PWD and tendering.
4. Understand the valuation of land and buildings, various methods and factors affecting valuation.

29) Course Name:- BTCVE705A Plastic Analysis and Design

1. Understand modes of structural collapse.
2. Perform the plastic analysis and design of various determinant and in-determinant structures.

30) Course Name:- BTCVC 801Introduction to Earthquake Engineering

1. Capture complexities in earthquake resistant design of structures
2. Grasp Nature of earthquake vibration and associated forces on structures
3. Understand importance of designing the building to targeted seismic performance.

31) Course Name:- BTCVE802BConstruction Techniques.

1. Understand the planning of new project with site accessibility and services required.
2. Comprehend thevarious civil construction equipment's.
3. Familiar with layout of RMC plant, production, capacity and operation process.
4. Recognize various aspect of road construction, construction of diaphragm walls, railway track construction etc.

32) Course Name:- BTCVE803ABridge Engineering

1. Understand components of bridges and its various types.
2. Understand site selection criteria and comprehend various forces acting on bridges.
3. Analyze bridge structures using different analysis techniques.
4. Understand the importance of different types of bridge bearings.

33) Course Name:- BTCVE803BStructural Audit

1. Gain the knowledge of Bye laws, procedure of Structural audit and study the typical problems in structures.
2. Aware of causes and types of deterioration in structures.
3. Develop skills for use of various Nondestructive tests required during auditing of structures.
4. Strength evaluation of existing structures.
5. Acquire knowledge of legal procedure to conduct structural audits.
6. Prepare a Structural audit report.

34) Course Name:-BTCVE804ARock Mechanics

1: Understand the mechanism of rock under various conditions.
2: Able to determine the engineering properties of rocks and sub-surface conditions
3: Identify various cause of slope failure and suggest some preventive measures for them.

35) Course Name:- BTCVE804DFinite Element Method

1. Understand the different energy methods in structural analysis and basic concepts of finite element method.
2. Analyze 1-D problems related to structural analysis like Bars, Trusses, Beams and Frames using finite element approach.
3. Find solution to problems using direct approach methods like Rayleigh – Ritz or Galerkin' s Method.
4. Solve 2-D problems using knowledge of theory of elasticity.
5. Students will be able to implement the knowledge of numerical methods in FEM to find the solution to the various problems in statics and dynamics.
6. Analyze 1D, 2D, and 3D structures using different software packages based on FEM.

36) Course Name:- BTCVE804ERepair & Rehabilitation of Structures.

1. Understand factors of Serviceability and Durability of Structures.
2. Determine crack width, effect of crack on materials, effect of moisture on structures.
3. Understand methods for protection of steel structures and masonry structures.
4. Understand various materials and methodologies used for repairing of structures.
5. Understand and implement techniques used for repairing and maintenance of structure.
6. Understand procedure to strengthen the existing structures and structural elements.

P.E.S College of Engineering
Department of Mechanical Engineering

Course Structure& CO

Course Structure for Semester III [Second Year] w.e.f. 2018-2019

BTMEC302 Materials Science and Metallurgy
BTMEC303 Fluid Mechanics
BTMEC304 Machine Drawing and CAD
BTMEC305 Thermodynamics
BTHM3401 Basic Human Rights

Course Structure for Semester IV [Second Year] w.e.f. 2018-2019

BTMEC401 Manufacturing Processes - I
BTMEC402 Theory of Machines-I
BTMEC403 Strength of Materials
BTID405 Product Design Engineering – I
BTHM3402 Interpersonal Communication Skill& Self Development

Course Structure for Semester V [Third Year] w.e.f. 2019-2020

BTMEC501 Heat Transfer
BTMEC502 Applied Thermodynamics – I
BTMEC503 Machine Design – I
BTMEC504 Theory of Machines- II
BTMEC505 Metrology and Quality Control

Course Structure for Semester VI [Third Year] w.e.f. 2019-2020
BTMEC601 Manufacturing Processes- II
BTMEC602 Machine Design-II
BTMEC603 Applied Thermodynamics- II
BTMEC604B IC Engines

Course Structure for Semester VII [Third Year] w.e.f. 2019-2020
BTMEC701 Mechatronics
BTMEC702 CAD/CAM
BTMEC703 Manufacturing Processes - III

BTMEC302 **Material Science and Metallurgy**
Course Outcomes:

CO1	Study various crystal structures of materials

CO2	Understand mechanical properties of materials and calculations of same using appropriate equations
CO3	Evaluate phase diagrams of various materials
CO4	Suggest appropriate heat treatment process for a given application
CO5	Prepare samples of different materials for metallography
CO6	Recommend appropriate NDT technique for a given application

BTMEC303 **Fluid Mechanics**

Course Outcomes:

CO1	Define fluid, define and calculate various properties of fluid
CO2	Calculate hydrostatic forces on the plane and curved surfaces and explain stability of floating bodies
CO3	Explain various types of flow. Calculate acceleration of fluid particles
CO4	Apply Bernoulli's equation and Navier-Stokes equation to simple problems in fluid mechanics
CO5	Explain laminar and turbulent flows on flat plates and through pipes
CO6	Explain and use dimensional analysis to simple problems in fluid mechanics
CO7	Understand boundary layer, drag and lift

BTMEC304 **Machine Drawing and Computer Aided Drafting**

Course Outcomes:

CO1	Interpret the object with the help of given sectional and orthographic views.
CO2	Construct the curve of intersection of two solids
CO3	Draw machine element using keys, cotter, knuckle, bolted and welded joint
CO4	Assemble details of any given part. i. e. valve, pump , machine tool part etc.
CO5	Represent tolerances and level of surface finish on production drawings
CO6	Understand various creating and editing commands in Auto Cad

BTMEC305 **Thermodynamics**

Course Outcomes:

CO1	Define the terms like system, boundary, properties, equilibrium, work, heat, idealgas, entropy etc. used in thermodynamics.
CO2	Study different laws of thermodynamics and apply these to simple thermal systems like balloon, piston-cylinder arrangement, compressor, pump, refrigerator, heat exchanger, etc. to study energy balance.
CO3	Study various types of processes like isothermal, adiabatic, etc. considering system with ideal gas and represent them on p-v and T-s planes.
CO4	Apply availability concept to non-flow and steady flow type systems.

CO5	Represent phase diagram of pure substance (steam) on different thermodynamic planes like p-v, T-s, h-s, etc. Show various constant property lines on them.

BTHM3401 **Basic Human Rights**

Course Outcomes:

CO1	Understand the history of human rights.
CO2	Learn to respect others caste, religion, region and culture.
CO3	Be aware of their rights as Indian citizen.
CO4	Understand the importance of groups and communities in the society.
CO5	Realize the philosophical and cultural basis and historical perspectives of human rights.
CO6	Make them aware of their responsibilities towards the nation.

BTMEC401 Manufacturing Processes-I

Course Outcomes:

CO1	Identify castings processes, working principles and applications and list various defects in metal casting
CO2	Understand the various metal forming processes, working principles and applications
CO3	Classify the basic joining processes and demonstrate principles of welding, brazing and soldering.
CO4	Study center lathe and its operations including plain, taper turning, work holding devices and cutting tool.
CO5	Understand milling machines and operations, cutters and indexing for gear cutting.
CO6	Study shaping, planing and drilling, their types and related tooling's

BTMEC402 **Theory of Machines- I**

Course Outcomes:

CO1	Define basic terminology of kinematics of mechanisms
CO2	Classify planar mechanisms and calculate its degree of freedom
CO3	Perform kinematic analysis of a given mechanism using ICR and RV methods
CO4	Perform kinematic analysis of a given mechanism analytically using vector or complexalgebra method
CO5	Perform kinematic analysis of slider crank mechanism using Klein’s construction andanalytical approach

BTMEC403 **Strength of Materials**

Course Outcomes:

CO1	State the basic definitions of fundamental terms such as axial load, eccentric load,stress, strain, E, μ, etc.
CO2	Recognize the stress state (tension, compression, bending, shear, etc.) and calculate thevalue of stress developed in the component in axial/eccentric static and impact load cases.
CO3	Distinguish between uniaxial and multiaxial stress situation and calculate principalstresses, max. shear stress, their planes and max. normal and shear stresses on a given plane.
CO4	Analyze given beam for calculations of SF and BM
CO5	Calculate slope and deflection at a point on cantilever /simply supported beam usingdouble integration, Macaulay's , Area-moment and superposition methods
CO6	Differentiate between beam and column and calculate critical load for a column usingEuler's and Rankine's formulae

BTID405 **Product Design Engineering - I**

Course Outcomes:

CO1	Create simple mechanicaldesigns
CO2	Create design documents for knowledgesharing
CO3	Manage own work to meet designrequirements
CO4	Work effectively withcolleagues

Semester -V

BTMEC501 **HeatTransfer**

Course Outcomes:

CO1	Explain the laws of heat transfer and deduce the general heat conduction equationand to explain it for 1-D steady state heat transfer in regular shape bodies
CO2	Describe the critical radius of insulation, overall heat transfer coefficient, thermalconductivity and lumped heat transfer
CO3	Interpret the extended surfaces
CO4	Illustrate the boundary layer concept, dimensional analysis, forced and free convection under different conditions
CO5	Describe the Boiling heat transfer, mass transfer and Evaluate theheat exchanger

	and examine the LMTD and NTU methods applied to engineering problems
CO6	Explain the thermal radiation black body, emissivity and reflectivity and evaluationof view factor and radiation shields

BTMEC502 **Applied Thermodynamics - I**

Course Outcomes:

CO1	Define the terms like calorific value of fuel, stoichiometric air-fuel ratio, excess air,equivalent evaporation, boiler efficiency, etc. Calculate minimum air required for combustion of fuel.
CO2	Study and Analyze gas power cycles and vapour power cycles like Otto, Diesel, dual, Joule and Rankine cycles and derive expressions for the performance parameters likethermal efficiency, P_m
CO3	Classify various types of boiler, nozzle, steam turbine and condenser used in steampower plant.
CO4	Classify various types of IC engines. Sketch the cut section of typical diesel engineand label its components. Define the terms like TDC, BDC, r_c, etc.
CO5	Draw P-v diagram for single-stage reciprocating air compressor, with and without clearance volume, and evaluate its performance. Differentiate betweenreciprocating and rotary air compressors.

BTMEC503 **Machine Design - I**

Course Outcomes:

CO1	Formulate the problem by identifying customer need and convert into designspecification
CO2	Understand component behavior subjected to loads and identify failure criteria
CO3	Analyze the stresses and strain induced in the component
CO4	Design of machine component using theories of failures
CO5	Design of component for finite life and infinite life when subjected to fluctuatingload
CO6	Design of components like shaft, key, coupling, screw and spring

BTMEC504 **Theory of Machines - II**

Course Outcomes:

CO1	Identify and select type of belt and rope drive for a particular application
CO2	Evaluate gear tooth geometry and select appropriate gears, gear trains
CO3	Define governor and select/suggest an appropriate governor
CO4	Characterize flywheels as per engine requirement
CO5	Understand gyroscopic effects in ships, aeroplanes, and road vehicles.
CO6	Understand free and forced vibrations of single degree freedom systems

BTMEC505 **Metrology and Quality Control**

Course Outcomes:

CO1	Identify techniques to minimize the errors in measurement
CO2	Identify methods and devices for measurement of length, angle, and gear and threadparameters, surface roughness and geometric features of parts.
CO3	Choose limits for plug and ring gauges.
CO4	Explain methods of measurement in modern machineries
CO5	Select quality control techniques and its applications
CO6	Plot quality control charts and suggest measures to improve the quality of productand reduce cost using Statistical tools.

BTMEC506A **Automobile Engineering**

Course Outcomes:

CO1	Identify the different parts of the automobile.
CO2	Explain the working of various parts like engine, transmission, clutch, brakes etc.,
CO3	Demonstrate various types of drive systems.
CO4	Apply vehicle troubleshooting and maintenance procedures.
CO5	Analyze the environmental implications of automobile emissions. And suggestsuitable regulatory modifications.
CO6	Evaluate future developments in the automobile technology.

BTMEC506C **Energy Conservation and Management**

Course Outcomes:

CO1	Understand energy problem and need of energy management
CO2	Carry out energy audit of simple units
CO3	Study various financial appraisal methods
CO4	Analyse cogeneration and waste heat recovery systems
CO5	Do simple calculations regarding thermal insulation and electrical energy conservation

BTMEL509 **Machine Design Practice - I**

Course Outcomes:

CO1	Apply design process to an open ended problem
CO2	Determine suitable material and size for structural component of machine/system
CO3	Apply iterative technique in design including making estimate of unknown values forfirst computation and checking or revisiting and re-computing
CO4	Choose logically and defend selection of design factors
CO5	Design of components for given part/system i.e. shaft, keys, coupling, links, screws,springs etc.

CO6	Work effectively as a part of design group/team
CO7	Have good communication skill, orally, graphically as well as in writing

Semester - VI

BTMEC601 **Manufacturing Processes - II**

Course Outcomes:

CO1	Understand the process of powder metallurgy and its applications
CO2	Calculate the cutting forces in orthogonal and oblique cutting
CO3	Evaluate the machinability of materials
CO4	Understand the abrasive processes
CO5	Explain the different precision machining processes
CO6	Design jigs and fixtures for given application

BTMEC602 Machine Design - II

Course Outcomes:

CO1	Define function of bearing and classify bearings.
CO2	Understanding failure of bearing and their influence on its selection.
CO3	Classify the friction clutches and brakes and decide the torque capacity and frictiondisk parameter.
CO4	Select materials and configuration for machine element like gears, belts and chain
CO5	Design of elements like gears, belts and chain for given power rating
CO6	Design thickness of pressure vessel using thick and thin criteria

BTMEC603 **Applied Thermodynamics – II**

Course Outcomes:

CO1	Apply first law of thermodynamics for closed systems and flow process. Produce TDS relations from Maxwell's relations.
CO2	Calculate thermal efficiencies of heat engine.
CO3	Calculate work done and heat transfer for flow and non-flow process.
CO4	Calculate properties of air vapor mixture using mathematical knowledge and psychrometric chart.

BTMEC604B **IC Engines**

Course Outcomes:

CO1	Explainfuel injection systems in SI engine, types of combustion chamber and combustion process.

CO2	Explain different types of fuel injection system and combustion chambers of CI engine.
CO3	Explain the mechanism of pollution formation and the evolution of emission norms.
CO4	Describe the properties of various alternative fuels, engine modification required and emission characteristic of alternative fuels
CO5	Discuss various ignition methods used in I.C engine and electronic engine management system.

Final Year

Semester - VII

MED401-INTERNAL COMBUSTION (I. C.) ENGINES AND GAS TURBINES

Course Outcomes:

CO1	Explain fuel injection systems in SI engine, types of combustion chamber and combustion process.
CO2	Explain different types of fuel injection system and combustion chambers of CI engine.
CO3	Explain the mechanism of pollution formation and the evolution of emission norms.
CO4	Describe the properties of various alternative fuels, engine modification required and emission characteristic of alternative fuels
CO5	Discuss various ignition methods used in I.C engine and electronic engine management system.

MED402- AUTOMATIC CONTROL SYSTEM

Course Outcomes:

CO1	Understand basic control concepts and control actions.
CO2	Understand simple mathematical modeling and the concept of block diagram and signal flow graph.
CO3	Study of system in time & frequency domain and understand concept of stability.

MED403-METROLOGY & QUALITY CONTROL

Course Outcomes:

CO1	Understand the principles, construction, use, techniques of handling and maintenance of various measuring instruments.
CO2	Plot and use of quality control charts and Suggest measures to improve the quality of product and reduce cost.
CO3	Students are expected to understand the fundamentals of quality & to apply different statistical process control tools for managerial decisions.
CO4	Understand the various types of sensors and their applications

CO5	Design a pneumatic circuit for a given application
CO6	Design a hydraulic circuit for a given application

MED404-ENERGY CONSERVATION AND MANAGEMENT

Course Outcomes:

CO1	Conceptual knowledge of the technology, economics and regulation related issues associated with energy conservation and energy auditing
CO2	Ability to analyse the viability of energy conservation projects
CO3	Capability to integrate various options and assess the business and policy environment regarding energy conservation and energy auditing
CO4	Advocacy of strategic and policy recommendations on energy conservation and energy auditing

MED405-: MECHATRONICS

Course Outcomes:

CO1	Define sensor, transducer and understand the applications of different sensors and transducers
CO2	Explain the signal conditioning and data representation techniques
CO3	Design pneumatic and hydraulic circuits for a given application
CO4	Write a PLC program using Ladder logic for a given application
CO5	Understand applications of microprocessor and micro controller
CO6	Analyse PI, PD and PID controllers for a given application
CO1	Define sensor, transducer and understand the applications of different sensors and transducers

Semester - VIII

MED451-AUTOMOBILE ENGINEERING

Course Outcomes:

CO1	Students understand the fundamentals of Automobile Engineering
CO2	Identify the different parts of the automobile.
CO3	Explain the working of various parts like engine, transmission, clutch, brakes.
CO4	Describe how the steering and the suspension systems operate.
CO5	Understand the environmental implications of automobile emissions

MED 452-PROJECT MANAGEMENT AND OPERATIONS RESEARCH

Course Outcomes:

CO1	To create awareness about optimization in utilization of resources.

CO2	To make them understand the concepts of Project Management for planning to execution of projects
CO3	To make them understand the feasibility analysis in Project Management and network analysis tools for cost and time estimation.
CO4	To enable them to comprehend the fundamentals of Contract Administration, Costing and Budgeting.
CO5	Make them capable to analyze, apply and appreciate contemporary project management tools and methodologies in Indian context.

MED453-REFRIGERATION AND AIR CONDITIONING

Course Outcomes:

CO1	Introduce students to HVAC technology, engineering, research, systems, system designs, energy impacts, and overall goals
CO2	Introduce students to HVAC technology, engineering, research, systems, system designs, energy impacts, and overall goals.
CO3	Students will demonstrate an understanding thermal comfort conditions with respect to temperature and humidity and human clothing and activities and its impact on human comfort, productivity, and health.
CO4	Students will demonstrate an understanding of the needs and requirements for ventilation and its impact on design and energy and its impact on human comfort, productivity, and health.
CO5	Students will demonstrate an understanding of psychrometrics and its application in HVAC engineering and design and will practice or observe psychrometric measurements.

MED 454 :FINITE ELEMENT ANALSIS

Course Outcomes:

CO1	To familiarize students with the displacement-based finite element method for displacement and stress analysis.
CO2	To study approximate nature of the finite element method and convergence of results are examined.
CO3	It provides some experience with a commercial FEM code and some practical modeling exercises.

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2.6.2 – Pass percentage of students 2019-20

Programme Code	Programme Name	Programme Specialization	Number of students appeared in the final year examination	Number of students passed in final semester/year examination	Pass Percentage
213461210	BE	Mechanical Engineering	59	59	100
213429310	BE	Electrical Electronics and Power	95	95	100
213437210	BE	Electronics and Telecommunication	12	12	100
213424210	BE	Computer Science and Engineering	24	24	100
213419110	BE	Civil Engineering	83	82	98.79

Key Indicator- 2.6 Student Performance and Learning Outcome

2.6.1 Program and course outcomes for all Program offered by the institution are stated and displayed on website and communicated to teachers and students.

Program Outcomes (POs): Program Outcomes is the professional accomplishments which the program aims at and these are to be attained by the students by the time they complete the program. Some of the key attainments that are knowledge, skill development, good communication skills, creative thinking, discipline, inculcation of moral and ethical values, ability to work in teams, and critical thinking. are to be acquired by the students during their graduation.

After completion of course students can go for higher education or choose teaching as career in college or university . The courses also offers opportunities to students for jobs in Banking, SSC, Railway and even Civil services etc

- **Civil Engineering:** After successful completion of course , the student will be able to understand proficiency apply relevant knowledge of mathematics, science and engineering to solve civil engineering problems. He can design and conduct civil engineering experiment as well as analysis and interpretetation of data related to civil engineering projects. He can also plan, organize and use resources like water resources , building material, human resources etc.
- **Mechanical Engineering:** After successful completion of course , the student will develop an abilty to function on multidisciplinary teams in the field of design, manufacturing, heat power, fluid power and control system. He can successful identify , formulate and solve engineering problem professionally and ethically.
- **Electrical Engineering:** After successful completion of course, the student will be well aware about the global level electrical engineering technology. He will be able to use state of art electrical techwares(Hardware and software) for analyzing the electrical engineering needs and problems to set the global level solutions.
- **Computer science Engineering:** After successful completion of course of Computer Science Engineering the student will be able to understand and proficiently apply the knowledge of mathematics, relevant sciences to CSE, to design software solutions to the given problem. He will develop an ability to design software and conduct their software simulations and testing to analyze and interpreter the results produced and verified their online performance. He will be able to design software projects for multidisciplinary applications areas and will be able to maintain it on field.
- **Electronics and Telecommunication:** :Upon successful completion of course, the graduate engineers will be able to understand and proficiently apply the relevant sciences and scientific method to electronic telecommunication engineering to design solution to complex problem in electronics systems , electronic circuit and control processes. he can identify , interpret and critically apprise current developments and advance technologies and apply them to electronics telecommunication field to enhance reliability and effiency of electronic based systems, components and pro

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Civil Engineering Department

1. (A) Program Outcomes (POs)

The engineering graduate will be able to:

1. Engineering knowledge: Apply the knowledge of mathematics, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identity, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or process that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, social and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

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5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical problemsand commit to professionalethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

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11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the needs for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

(B). Program specific outcomes (PSOs)

1. Apply basic knowledgerelated to civil engineering to solve societal engineering problems.

2. Recognize and adopt to technical developments and to engage in life-long learning and develop consciousness for professional, social, legal and ethical responsibilities.

3. Excellent adoptability to the changing industrial and real world requirements.

2. Course Outcomes (Cos)

1. F. Y. B. Tech (civil)

101. BTES106/206 Basic Civil and Mechanical Engineering

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1.Identify various civil engineering materialsand choose suitable material among various options.

2. Apply principles of surveying to solve engineering problems.

3. Identify various civil engineering structural components and select appropriate structural system among various options.

4. Explain and define various properties of basic thermodynamics, material and manufacturing processes.

5. Know and discuss the working principle of various power consuming and power developing devices.

Course	P01	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
101.1	-	1	-	-	-	-	1	1	-	-	1	-
101.2	-	-	-	-	1	1	-	-	-	-	1	-
101.3	1	1	1	-	1	-	-	1	1	-	-	1
101.4	1	1	-	1	1	1	1	-	-	-	-	1
101.5	-	1	-	1	1	-	1	1	1	-	1	1

102. BTES103/203 Engineering Mechanics

1. Apply fundamental laws of engineering mechanics.

2. Apply conditions of static equilibrium to analyze given force system.

3. Compute centre of gravity and moment of inertia of plane surfaces.

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4. Compute the motion characteristics of a body particle for a rectilinear and curvilinear motion.

5. Know and discuss relation between force and motion characteristics.

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
102.1	3	3	-	-	1	-	-	-	-	-	-	1
102.2	3	3	-	-	1	-	-	-	-	-	-	1
102.3	3	3	-	-	1	-	-	-	-	-	-	1
102.4	3	3	-	-	1	-	-	-	-	-	-	1
102.5	3	3	-	-	1	-	-	-	-	-	-	1

103. BTES105/205 Energy and Environmental Engineering

1. Identify conventional and non-conventional energy sources.

2. Know and discuss power consuming and power developing devices for effective utilization and power consumption.

3. Identify various sources of air, water pollution and its effects.

4. Know and discuss noise, soil, thermal pollution and identify solid, biomedical and hazardous waste.

5. Comprehend bout energy conservation and its importance.

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
103.1	1	3	1	2	1	1	1	1	-	-	-	1

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103.2	1	2	1	1	1	1	1	1	-	-	1	1
103.3	-	1	1	-	1	2	2	2	1	1	1	1
103.4	1	1	2	1	1	2	2	2	1	1	1	1
103.5	1	1	2	2	1	1	1	1	1	1	1	1

2. S. Y. B. Tech: Semester-III

201.BTBSC301 Mathematics-III

1. Gain comprehensive knowledge of Laplace Transform and its application.

2. Understand Fourier Transform

3. Study partial Differential Equations, their formation and application.

4. Get familiar with Functions of complex variables (Differential and integral calculus)

5. On completion of the course, the student will be able to formulate and solve mathematical model of civil engineering phenomena in field of structure, survey, fluid mechanics and soil mechanics.

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
201.1	3	3	1	-	-	-	-	-	-	-	-	3

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201.2	3	3	1	-	-	-	-	-	-	-	-	3
201.3	3	3	1	-	-	-	-	-	-	-	-	3
201.4	3	3	1	-	-	-	-	-	-	-	-	3
201.5	3	3	1	1	1	1	1	1	1	-	1	3

202.**BTCVC302 Mechanics of solids**

1. Perform the stress-strain analysis.

2. Draw force distribution diagrams for members and determinate beams.

3. Find deflection in determinant beams.

4. Understand working of columns under different loading conditions.

5. Visualize force deformation behavior of bodies.

Course	P01	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
202.1	1	3	-	1	-	-	-	-	-	-	-	3
202.2	1	3	-	1	-	-	-	-	-	-	-	3
202.3	1	3	-	1	-	-	-	-	-	-	-	3

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202.4	1	3	-	1	-	-	-	-	-	-	-	3
202.5	1	3	1	1	1	-	-	-	-	-		3

203. BTCVC303 Hydraulics-I

1.Calibrate the various flow measuring devices.

2. Determine the properties of fluid and pressure and their measurement.

3. Understand fundamentals of pipe flow, losses in pipe and analysis of pipe network.

4. Use different methods of flow measurement and their application.

5. Visualize fluid flow phenomena observed in civil engineering systems.

Course	P01	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
203.1	1	1	-	1	-	-	1	1	-	-	-	1
203.2	1	1	-	1	-	-	-	-	-	-	1	1
203.3	1	2	2	1	1	1	1	1	-	-	-	1
203.4	1	1	-	1	1	1	1	1	-	-	-	1
203.5	1	2	-	1	1	-	-	-	-	-	-	1

204. BTCVC304 Surveying-I

1. Perform measurements in linear/angular methods.

2. Perform plane table surveying in general terrain.

3. Know the basics of leveling and theodolite survey in elevation and angular measurements.

4. Understand contouring and its application, and Planimeter and its use to compute area.

5. Carry out engineering surveys for different projects like highways, tunnels, railways, waterways, mines, and curve ranging etc.

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
204.1	1	1	-	-	1	1	-	-	1	-	-	1
204.2	-	2	-	-	1	1	-	-	1	-	-	1
204.3	1	2	-	-	1	-	-	-	1	-	-	1
204.4	1	1	-	1	1	1	1	-	1	-	-	1
204.5	1	1	1	1	1	1	1	1	1	-	-	1

2.5. BTCVC305 Building Construction

1. Understand types of masonry structures.

2. Understand composition of concrete and effect of various parameters affecting strength.

3. Comprehend components of building and their purposes.

4. Comprehend the pre-cast and pre-engineered building construction techniques.

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2.6. BTCVC306 Engineering Geology

1. Recognize the different land forms which are formed by various geological agents.

2. Identify the origin, texture and structure of various rocks and physical properties of minerals.

3. Emphasize distinct geological structures which have influence on the civil engineering structure.

4. Understand how the various geological conditions affect the design parameters of structures.

2.7. BTHS303 Soft Skill Development

1. Learners will acquire interpersonal communication skills.

2. Learners will develop the ability to work independently.

3. Learners will develop the qualities like self-discipline, self-criticism and self-management.

4. Learners will have the qualities of time management and discipline.

5. Learners will be able to present themselves as an inspiration for others.

2.9. BTCVL308 Surveying Laboratory-I

1. Use of the theodolite along with chain/tape, compass on the field.

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2. Apply geometrical and trigonometric principles of basic surveying calculations.

3. Plan a survey, taking accurate measurements, field booking, and adjustment of errors.

4. Apply field procedures in basic types of surveys, as part of a surveying team.

5. Employ drawing techniques in the development of a topographic map.

2.10. BTCVL309 Building Construction- Drawings laboratory

1. Draw plan, elevation and section of various structures.

2. Apply the principles of planning and by-laws used for building planning.

3. Prepare detail working drawing for doors and windows.

2.11. BTCVL310 Engineering Geology Laboratory

1. Find the engineering properties of various geological materials.

2. Identify minerals and rocks by studying physical properties.

3. Draw sub-surface lithologs.

4. Calculate the linear measurement on surface.

3. S. Y. B. Tech Semester-IV

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3.1 BTCVC401 Hydraulics-II

1. Design open channel section in a most economical way.

2. Know about the non-uniform flows in open channel and the characteristics of hydraulic jump.

3. Understand applications of momentum principle of impact of jets on plane

3.2 BTCVC402 Surveying-II

1. Understand basics different types of curves on roads and their preliminary survey.

2. Perform setting of curves, buildings, culverts and tunnels.

3. Comprehend different geodetic methods of survey such as triangulation, trigonometric leveling.

4. Comprehend modern advanced surveying techniques.

3.3 BTCVC403 Structural Mechanics-I

1. Describe the concept of structural analysis, degree of indeterminacy.

2. Calculate slopes and deflection at various locations for different types of beams.

3. Identify determinate and indeterminate trusses and calculate forces in the members of trusses.

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4. Perform the distribution of the moments in the continuous beam and frame.

3.4 BTCVC405 Product Design Engineering

1. Create simple design of components or a system as a whole.

2. Create design documents for knowledge sharing.

3. Manage own work to meet design requirements.

4. Work effectively in a team.

3.7 BTCVC406 Engineering Management

1. Demonstrate the nuances of management functions.

2. Analyze the framework of a business organization

3. Adopt an empirical approach towards business situations.

4. Apply various management techniques.

3.9 BTCVL407 Hydraulic Engineering Laboratory-II

1. Understand various properties of fluids and measurement techniques.

2. Carry out calibrations of various flow measuring devices.

3. Understand mechanism of hydraulic jump, various jets and pumps.

3.10 BTCVL408 Surveying Laboratory-II

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1. Determine contour level of field.

2. Determine the tachometric constants and grade of a line.

3. Use sub-tense bar for distance measurement

3.11 BTCVL409 Solid Mechanics Laboratory

1. Evaluate Young's Modulus, torsional strength, hardness and tensile strength of given specimen.

2. Determine the strength of coarse aggregates.

3. Find the compressive strengthof concrete cubes and bricks.

4. Determine physical properties of given coarse aggregates, fine aggregate and cement samples.

4. T. Y. B. Tech Semester-V

4.1 BTCVC501 Design of Steel Structures

1. Identify and compute the design loads and the stresses developed in the steel member.

2. Analyze and design the various connections and identify the potential failure modes.

3. Analyze and design various tension, compression and flexural members.

4. Understand provisions in relevant BIS codes.

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4.2 BTCVC502 Structural Mechanics-II

1. Have a basic understanding of matrix method of analysis and will be able to analyze the determinant structure.

2. Have a basic understanding of the principles and concepts related to finite difference and finite element methods.

3. Have a basic understanding of concept of influence line.

4.3 BTCVC503 Soil Mechanics

1. Understand different soil properties and behavior.

2. Understand stresses in soil, permeability and seepage aspects.

3. Develop ability to take up soil design of various foundations.

4.4 BTCVC504 Environmental Engineering

1. Apply the water treatment concept and methods.

2. Prepare basic process designs of water and wastewater treatment plants.

3. Apply the wastewater treatment concept and methods.

4. Apply the solid waste management concepts.

4.5 BTCVC505 Transportation engineering

1. Comprehend various types of transportation systems and their history of the development.

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2. Comprehend to various types of pavements.

3. Design the pavements by considering various aspects associated with traffic safety measures.

4.7 BTCVL508 Soil Mechanics Laboratory

1.Determine different engineering properties of soil**.**

2. Identify and classify soils based on standard geotechnical engineering practices.

3. Perform laboratory compaction and in-place density test.

4.8 BTCVL509 Environmental Engineering Laboratory

1. Quantify the pollutant concentration in water, wastewater and ambient air.

2. Recommend the degree of treatment required for the water and wastewater.

3. Analyze the survival conditions for the microorganism and its growth rate.

4.9 BTCVL510 Transportation Engineering Laboratory

1. Perform tests on various road construction materials.

2. Perform CBR tests on local soils to determine subgrade properties needed for roadways.

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4.9 BTCVE506A Materials, testing & Evaluation

1. To develop skill among students to construct strong and durable structural by applying knowledge of material science.

2. To make the students aware of quality assurance and control in their real life as a professional.

4.10 BTCVE506C Development Engineering

1. to develop multi scaled perspective about decision in the built environment.

2. To expose the students to the analysis and evaluation of real world problems aiming to bring desired change in the society.

5. T. Y. B. Tech Semester-VI

5.1 BTCVC601 Design of Concrete Structures-I

1. Comprehend to the various design philosophies used for design of reinforced concrete.

2. Analyze and design the reinforced concrete slab using limit state and working state methods.

3. Analyze and design the reinforced concrete beam using limit state and working state methods.

4. Analyze and design the reinforced concrete column using limit state and working state methods.

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5.2 BTCVC602 Foundation Engineering

1. To predict soil behavior under the application of loads and come up with appropriate solutions to foundation design queries.

2. Analyze the stability of slope By theoretical and graphical methods.

3. Analyze the results of in-situ tests and transform measurements and associated uncertainties into relevant design parameters.

4. Synthesize the concepts of allowable stress design, appropriate factors of safety, margin of safety and reliability.

5.3 BTCVC603 Concrete Technology

1. Understand the various types and properties of ingredients of concrete.

2. Understand effect of admixtures on the behavior of the fresh and hardened concrete.

3. Formulate concrete design mix for various grades of concrete.

5.4 BTCVC604 Project Management

1. Understand various steps in project management, different types of charts.

2. Construct network by using CPM and PERT methods.

3. Determine the optimum duration of project with the help of various time estimates.

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4. Know the concept of engineering economics, economic comparisons, and linear break even analysis problems.

5. Understand the concept of total quality management including Juran and Deming's philosophy.

5.5 BTCVC606 Building Planning and Design

1. To plan building considering various principles of planning and bye-laws of governing body.

2. Comprehend various utility requirements in buildings.

3. Understand various techniques for good acoustics.

5.7 BTCVL608 Building Design and Drawing Laboratory

1. Draw plan, elevation and section of load bearing and framed structures.

2. Draw plan, elevation and section of public building.

5.8 BTCVE605A Waste Water treatments

1. Determine the sewage characteristics and design various sewage treatment plants.

2. Understand municipal water and wastewater treatment system design and operation.

3. Apply environmental treatment technologies and design processes for treatment of industrial waste.

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4. Understand the rural sanitation systems.

5.10 BTCVE605D Advanced Engineering Geology

1. Understand geological time scale and physiographic division of India and their geological characteristics and different geological formation in India.

2. Perform sub-surface exploration and interpret core log.

3. Solve numerical problem based on core drilling and seismic data.

4. Familiar with origin of earthquake, seismic wave and landslide in Deccan trap.

5.11 BTCVE605E Advanced soil mechanics

1. Behavior of soil based on its particle size and mineral contents.

2. Ability to understand the Earth work equipment.

3. Ability to understand the necessityof ground improvement and potential of ground for improvement.

4. Understand the soil reinforcement mechanisms.

5. Understand the grouting and injection methods.

6. B. Tech Semester-IIV

6.1 BTCVC701 Design of Concrete Structures-II

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1. Able to identify the behavior, analyze and design of the beam sections subjected to torsion.

2. Able to analyze and design of axially and eccentrically loaded column and construct the interaction diagram for them.

3. Understand various concepts, system and losses in pre-stressing.

4. Able to analyze and design the rectangular and symmetrical I-section pre-stressed beam/girders.

6.2 BTCVC702 Infrastructure Engineering

1. Know about the basics and design of various components of railway engineering.

2. Understand the type and functions of tracks, junctions and railway stations.

3. Know about the aircraft characteristics, planning and components of airport.

4. Understand the types and components of docks and harbors.

6.3 BTCVC703 Water Resources Engineering

1. Understand need of irrigation in India and water requirement as per farming practice in India.

2. Understand various irrigation structures and schemes.

3. Develop basis for design of irrigation schemes.

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6.4 BTCVC704Professional Practice

1. Understand the importance of preparing the types of estimates under different conditions for various structures.

2. Know about the rate analysis and bill preparation and to study about specification writing.

3. Know the various types of contract, accounts in PWD, methods for initiating the works in PWD and tendering.

4. Understand the valuation of land and building, various methods and factors affecting valuation.

6.5 BTCVC705Construction Technique

1. Understand the planning of new project with site accessibility and service required.

2. Comprehend the various civil construction equipments.

3. Familiar with layout of RMC plant, production, capacity and operation process.

4. Recognize various aspects of road construction, construction of diaphragm walls, railway track construction etc.

6.6 BTCVE705B Engineering Economics

1. Adopt as per principles of economics and financing.

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2. Analyze available alternatives and propose best suitable among them.

3. Apply various models of financial management and accounting.

6.8 BTCVE705D Limit State Design of Steel Structures

1. Identify and compute the design loads and the stresses developed in the steel member.

2. Analyze and design the various connections and identify the potential failure modes.

3. Analyze and design the various tension, compression and flexural members.

4. Understand various guidelines set by BIS Codes.

6.9 BTCVE705E Plastic Analysis and design

1. Understand modes of structural collapse.

2. Perform the plastic analysis and design of various determinant and in-determinant structures.

3. Adapt plastic theory of design for various structures.

6.10 BTCVE705F Water power Engineering

1. Identify potential energy sources and adapt as per the requirement.

2. Inculcate basics of electricity generation and power plants.

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3. Propose suitable energy source for running a project optimistically.

6.12 BTCVE705B Air pollution control

1.Identify the sources of air pollutants and their effect on human, plants and materials.

2. Apply knowledge of meteorology for controlling air pollution.

3. Design air pollution controlling equipments.

4. Apply knowledge of legislation for preparation and control of air pollution.

6.13 BTCVE705C Bridge Engineering

1. Understand components of Bridges and its various types.

2. Understand site selection criteria and comprehend various forces acting on bridges.

3. Analyze bridge structures using different analysis technique.

4. Understand the importance of different types of bridge bearings.

614 BTCVE705D Introduction to Earthquake Engineering

1. Capture complexities in earthquake resistant design of structures.

2. Grasp nature of earthquake vibration and associated forces on structures.

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3. Understand importance of designing the building to targeted seismic performance.

6.15 BTCVOE706E Town and Urban Planning

1. Understand town and urban planning and their essential attributes.

2. Identify elements of planning and regulations of the same.

3. Implement guidelines provided by standard authorities.

6.16 BTCVOE706F Tunneling and Underground Excavations

1. Understand types of tunnels and tunneling methods conforming to site conditions.

2. Investigate various tunneling operations and relevant machinery required.

3. Understand methods and operations of excavating large and deep tunnels.

4. Propose suitable tunneling and excavation methods to optimize the same.

6.17 BTCVL707 Design Drawing of RC and steel Structures

1. On completion of the course, student will be able to simulate a practical design requirement into a theoretical statement to solve mathematically to arrive at a safe economical and realistic feasible solution that can be executed.

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6.18 BTCVL708 Professional Practice

1.Understand the specification drafting and framing rate analysis.

2. Carry out the estimates of various civil engineering structures.

3. Prepare valuation report of civil engineering structures.

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People Education Society's (Mumbai)

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Department of Computer Science & Engineering

Program outcomes, program specific outcomes and course outcomes

PROGRAM OUTCOMES

After completing four year graduate course of BTech (CSE) the students will be able to:

1. Understand and proficiently apply the knowledge of mathematics, relevant sciences to CSE, to design software solutions to the given problems.
2. An ability to design software & conduct their software simulations and testing to analyze and interpret the results produced and verify their online performance.
3. Will be able to design a software automation system for various application areas using efficient algorithms, the computer resources and components, to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturing, and sustainability.
4. Will be able to Design software projects for multidisciplinary applications areas and will be able to maintain it on field.
5. An ability to identify, formulate the problem definitions for which the software solution can be designed and will be able to implement them.
6. Will be able to demonstrate commitment by developing professional softwares for various applications as per ethical standards and rules led by society.
7. Will be able to communicate with the corporate world effectively by implementing techniques for verbal and nonverbal communication skills taught in syllabus.
8. The computer Graduate will be able to understand impact of software solutions in a global economic, environmental and social context.
9. Will be able to design software solutions using recent algorithms and also continuously modify them as per the current needs of the society through lifelong learning and professional development.
10. Will be able to demonstrate knowledge of contemporary issues.
11. Show awareness of and ability to proficiently identify and apply project management tools and methodologies to the planning and execution of software projects leading to software.
12. Will be able to plan and use computer resources and other systems efficiently.

Program Specific Outcomes

1. Model computational problems by applying mathematical concepts and design solutions using suitable data structures and algorithmic techniques

2. Design and develop solutions by following standard software engineering principles and implement by using suitable programming languages and platforms

3. Develop system solutions involving both hardware and software modules.

4. Become socially responsible engineers with good leadership qualities and effective interpersonal skills.

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5. Acquire domain knowledge to pursue higher education and research.

Course Outcomes:

Course	Course Outcomes
SY CSE PART-I Engineering Mathematics-III	1. Students will able to understand and proficiently apply the relevant sciences and scientific methods to Engineering Mathematics, to design solutions to complex problems. 2. Students will able to identify, interpret and critically appraise current developments and advanced technologies and apply them to Engineering Mathematics. 3. Students will able to determine analyses and proficiently apply theoretical and numerical analysis of phenomena to conceive, control and optimize the performance of Engineering Mathematics. 4. Students will able to develop and implement creative and innovative approaches to problem solving.
SY CSE PART-I DMS	1. Student will be able to formulate problems precisely and solve the problems. 2. Student will be able to apply formal proof techniques, and explain their reasoning clearly. 3. Students can analyze basics knowledge gained by mathematical logic and apply them. 4. Use algorithms for suitable applications
SY CSE PART-I CAO	1. To train the students with concept of microprocessor and computer architecture and organization. 2. To provide the knowledge of instruction set of 8086 and assembly programming. 3. To analyze the memory operations
SY CSE PART –I OOP using C++	1. Student will be able to understand the features of C++ supporting object oriented programming 2. Student will be able to understand the relative merits of C++ as an object oriented programming language 3. Student will be able to understand how to produce object-oriented software using C++ 4. Student will be able to understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism
SY CSE PART –I Product Design Engineering	1. With the inclusion of concepts of 3D design, sketching. 2. Product manufacturing, digital designing, business communications, product design is the application of technology and designing knowledge in different product designing and manufacturing processes..
SY CSE PART-I Programming in Java	1. The students will be able to apply object oriented features to real time entities. 2. The students will be able handle exceptions & implement multithreaded programs. 3. The students will be able implement database programming. 4. The students will be able design & implement GUI with event handling 5. The students will be able develop I/O & networking programs.

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SY CSE PART-I Python Programming	1. Students will understand Python programming basics and paradigm. 2. Students will understand python looping, control statements and string manipulations. 3. Students will be made familiar with the concepts of GUI controls and designing GUI applications. 4. Students will understand concepts of file handling, exception handling and database connectivity. 5. Design and implement a program to solve a real world problem. 6. Students will make database connectivity in python programming language.
SY CSE PART-I HTML & JavaScript	1. Students will understand programming in HTML and JavaScript. 2. Students will develop web applications using HTML. 3. Student will be able to design console websites using HTML and JavaScript.
SY CSE PART-II Operating System	1. Will be able to define, formulate problem definitions for designing various modules of operating system. 2. Will be able to design the modules of operating system that meets the realistic constraints such as economic, environmental, health safety & sustainability. 3. The student will be able to analyze use of existing OS (platform independent feature of operating system software), as well as design the operating system for multidisciplinary application areas. 4. Will be able to analyze the impact of design of operating system on various aspects such as environmental, economic, social environment. 5. Will be able to develop the algorithms or modify the existing algorithms to solve the problems in current designs as per the need of application.
SY CSE PART-II Design and analysis of Algorithms	1. The student will be able to define, formulate problem definitions for designing algorithms. 2. The student will be able to understand the syntax and design algorithms. 3. The student will be able to use the various design methods and skills to solve the problem like TSP, Knapsack. 4. The student will be able to describe divide and conquer paradigm and explain when an algorithmic design situation calls for it. 5. Will be able to analyze graph algorithms and apply graph concept to model engineering problems. 6. Will be able to design the algorithm that meets the realistic constraints such as Economic, Time constraint, Space constraint 7. The student will be able to conclude which algorithmic method is better for given problem. 8. The student will be able to modify the existing algorithms to solve the problems in current designs as per the need of application.

TY CSE PART-I Theory of computation	**1.** Student will be able to define, formulate problem definitions for designing machines **2.** Student will be able to identify and formulate the problems in a Finite Automata and also verify the performance of a machine by giving the input**.** **3.** Student will be able to design Regular Expression for multidisciplinary application areas **4.** Student will be able to develop and implement creative and innovative approaches to problem solving **5.** Student will be able to build the techniques and skills to design syntactically correct Regular Languages using Context Free Grammar **6.** Student will be able to use the techniques and skills to design syntactically correct Regular Languages using Context Free Grammar **7.** Student will be able to design TM for multidisciplinary application areas. **8.** Student will be able to build the programming technique for Turing machine
TY CSE PART-I Database Management System	1. Will be able to define, formulate problem definitions for designing various modules database management system. 2. Will be able to design the database system that meets the realistic constraints such as Economic, Environmental, Health Safety, and Sustainability. 3. The student will be able to analyze existing databases for multidisciplinary application areas. 4. Student will be able will be able to analyze the impact of design of database system on various aspects such as environmental, economic, social environment. 5. Student will be able will be able to develop and modify the existing database systems to solve the 6. Student will be able understand problems in current designs as per the need of application. 7. Student will be able Plan, organize and use computer resources as well as manpower efficiently by developing efficient database applications. 8. Knowledge of contemporary issues. 9. Communicate effectively on both technical and general issues with peers, associates, 10. Clients and the general public to define the problem specification.
TY CSE PART-II Computer Network	1. To understand fundamental concepts of computer networking and functionality of layered network architecture. 2. To understand wireless and mobile networking concepts 3. To apply networking concepts to various situations, classifying networks, analysing performance of computer network infrastructure.
TY CSE PART-II Compiler Design	1. Will be able to define, formulate problem definitions for designing various types of compiler. 2. Will be able to design programs using LEX, YACC tools for multidisciplinary application areas and will be able to maintain it on field. 3. Will be able to use the techniques and skills to design a program by using compiler. 4. Will be able to identify and formulate the problems in a program and also verify the performance of a program. 5. Will be able to design the software program for various application areas using compiler construction tools, the computer resources and components, to meet the desired needs. 6. Will be able to develop and implement creative and innovative approaches to problem solving.

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Final Year CSE PART-I Digital Image Processing (Elective-VIII)	1. Students should be able to understand digital image processing beyond the fundamental level. 2. To study complete digital image processing steps. 3. Students should be able to choose appropriate image processing algorithm to achieve desired result. 4. Students should be able to properly implement DIP algorithms using modern computing tools Such as MATLAB, interpret and present the results.
Final Year CSE PART –I Elective 9- Cloud Computing	1. To learn and understand Cloud Technologies 2. To design, develop and deploy Cloud applications 3. To get acquainted with the challenges and security aspects of Cloud Computing. 4. To study Mobile Cloud Applications
Final Year CSE PART –II Software Engineering	1. Will be able to use OOPS concepts, various computer architectures, languages for programming and UML to design software models. 2. Will be able to define, formulate & analyze the problem definition also hardware, software & other computing requirements to design a software solution for it. 3. Will be able to design software using software engineering phases to meet the desired needs of a client within the realistic constraints such as environmental ethical, economic, political, manufacturing, and sustainability. 4. Will be able to design software projects in various application areas like business, research, commercial, banking internet, mobile applications and maintain it. 5. Will develop the software as per software engineering standards, & rules led by the society. 6. Will be able to analyze the impact of software on world economy, social aspects. 7. Will be able to plan organize software development process so that computer resourcesefficiently.

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Class: SYCSE
SEM-III

			PO												PSO				
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
1	BTBSC301	Engineering Mathematics -III	√	√		√		√		√	√	√			√	√	√		
2	BTCOC302	Discrete Mathematics		√	√	√		√	√	√	√	√	√	√	√	√	√		√
3	BTCOC303	Data Structures	√	√		√	√	√		√	√	√			√	√	√	√	√
4	BTCOC304	Computer Architecture & Organization	√		√	√	√	√	√		√	√	√	√	√	√			
5	BTCOC305	Digital Electronics & Microprocessors		√		√		√	√	√	√	√				√	√	√	√
6	BTHMC306	Basic Human Rights	√	√		√			√		√	√	√	√	√	√	√		
7	BTCOL307	Python Programming	√	√	√		√		√	√	√	√	√				√	√	√
8	BTCOL308	HTML and Javascript		√	√		√	√	√	√				√	√			√	
8	BTCOL309	Data Structures Lab	√	√	√			√	√		√	√		√		√	√		√
9	BTCOL310	Digital Electronics & Microprocessor Lab	√	√	√	√	√		√	√	√		√	√	√	√		√	√
10	BTCOF311	Field Training / Internship/Industrial Training Evaluations		√	√	√	√	√	√		√	√	√		√		√	√	

Class: SYCSE
SEM-IV

			PO												PSO				
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
1	BTCOC401	Design & Analysis of Algorithms	√																
2	BTCOC402	Probability & Statistics	√	√		√		√		√	√	√			√	√	√		
3	BTCOC403	Operating System		√		√	√	√	√	√		√	√	√	√	√	√		
4	BTCOE404	Elective-I Object Oriented Programming in C++ Object Oriented Programming in Java	√		√		√		√	√	√	√	√				√	√	√
5	BTCOE405	Elective-II Soft Skills and Personality Development		√	√		√			√		√	√	√	√	√	√	√	
6	BTXXC406	Product Design Engineering		√	√	√		√		√	√	√	√	√				√	√
7	BTCOL407	Design & Analysis of Algorithms Lab	√	√	√	√		√	√	√	√				√	√			√
8	BTCOL408	Introduction to Data Science with R		√	√	√			√	√		√	√		√		√	√	
9	BTCOL409	Object Oriented Programming Lab		√	√		√	√	√	√				√	√			√	
10	BTCOL410	Operating System Lab	√	√	√			√	√		√	√		√		√	√		
11	BTCOF411	Field Training / Internship/Industrial Training	√	√	√			√	√		√	√		√		√	√		

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Class: TYCSE
SEM-V

			PO												PSO				
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
1	BTCOC501	Database Systems		√		√		√	√	√	√	√				√	√	√	
2	BTCOC502	Theory of Computations	√	√		√			√		√	√	√	√	√	√	√		√
3	BTCOC503	Machine Learning	√	√	√		√		√	√	√	√	√				√	√	
4	BTCOE504	Elective – III Introduction to Research		√	√		√	√	√	√				√	√			√	√
5	BTCOE505	Elective – IV Business Communication	√	√	√			√	√		√	√		√		√	√		
6	BTCOC506	Competitive Programming-I	√	√		√	√	√	√				√	√			√		√
7	BTCOL507	Database System Laboratory		√	√		√	√	√	√				√	√			√	√
8	BTCOL508	Machine Learning Laboratory	√	√	√			√	√		√	√		√		√	√		
9	BTCOS509	Seminar	√	√		√	√	√	√				√	√			√		√
10	BTCOF411	Field Training / Internship / Industrial Training Evaluation	√	√		√	√	√	√				√	√			√		√

Class: TYCSE
SEM-VI

			PSO												PEO				
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
1	BTCOC601	Compiler Design		√		√		√	√	√	√	√				√	√	√	
2	BTCOC602	Computer Networks	√	√		√			√		√	√	√	√	√	√	√		√
3	BTCOE603	Elective – V Human Computer Interaction	√	√	√		√		√	√	√	√	√		√		√	√	√
4	BTCOE604	Elective – VI Internet of Things		√	√		√	√	√	√	√	√		√	√			√	
5	BTCOE605	Elective – VII Consumer Behaviour	√	√	√			√	√		√	√		√		√	√		√
6	BTCOC606	Competitive Programming-II	√	√		√	√	√	√				√	√			√		
7	BTCOL607	(A) Internet of Things Laboratory	√	√		√	√	√	√		√		√	√			√	√	
8	BTCOL608	Computer Networks Laboratory	√	√		√	√	√	√		√		√	√			√		√
9	BTCOF609	Field Training / Internship / Industrial Training	√	√		√	√	√	√		√		√	√			√	√	

Class: Final CSE
SEM-VII

	PO												PSO				
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5

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1	BTCOC701	Software Engineering	√		√		√	√	√	√	√				√	√	√		√
2	BTCOE702	Elective - VIII Fundamental of Digital Image Processing	√	√	√	√		√	√	√	√	√	√			√	√	√	
3	BTCOE703	Elective - IX Natural Language Processing	√	√		√	√		√		√	√	√	√	√	√	√		√
4	BTCOE704	Open Elective - X Design Thinking	√	√	√		√		√	√	√	√	√	√			√	√	
5	BTCOL705	Full Stack Development		√	√		√	√	√	√	√		√	√	√			√	√
6	BTCOL706	System Administration	√	√	√			√	√		√	√		√		√	√		
7	BTCOL707	Elective – VIII Lab	√	√		√	√	√	√				√	√			√		√
8	BTCOL708	Elective – IX Lab		√	√		√	√	√	√				√	√			√	
9	BTCOP709	Project phase - I	√	√	√			√	√		√	√		√		√	√		√
10	BTCOF609	Field Training / Internship / Industrial Training	√	√		√	√	√	√				√	√			√		√

Class: Final CSE
SEM-VIII

			PO												PSO				
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
1	BTCOE801	Elective – XI -(A) Deep Learning	√	√	√		√		√	√	√	√	√				√	√	
2	BTCOE802	Open Elective – XII- (A) Introduction to Industry 4.0 and Industrial Internet of Things	√	√	√		√	√	√	√	√	√	√		√		√	√	√
3	BTCOE803	Project phase - II (In-house) / Internship and project in the Industry	√	√	√		√		√	√	√	√	√		√		√	√	√

P. E. S. College of Engineering

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People's Education Society's (Mumbai)

COLLEGE OF ENGINEERING, AURANGABAD (MS)

P.E.S VISION: "The people's education society's objective is not merely go give education, but to give education in such a manner as to promote intellectual, moral and social democracy. This is what modern India needs and this is what all the well-wishers of India must promote."

INSTITUTE VISION:

To create technical manpower with global competitiveness, morality and social sense.

MISSION:

The P.E.S. College of Engineering is committed to create intellectual engineers having updated professional competencies to work in various domains.

The institute is committed to provide state-of-art infrastructure and learning environment with inbuilt continual development processes so as to build the individual having moral and social attributes leading them to compete globally.

PROGRAM NAME: ELECTRICAL ENGINEERING

PROGRAM VISION: To create competent technical manpower with moral and social sense in the field of electrical engineering.

PROGRAM MISSION:

The department of Electrical Engineering is committed to

1. Provide state of art infrastructure and learning environment with continual development processes so as to build the individual having moral and social attributes.
2. Create competent Engineers having updated professional competencies to work in various domains.

PROGRAM EDUCATIONAL OBJECTIVES:

1. To provide global level technical competency in students.
2. To impart good citizenship qualities in the students so as to work as a responsible member of society.
3. To develop professional leadership qualities in students to become a capable technocrat.

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PROGRAM OUTCOMES:

Upon successful completion of this course it is expected that electrical graduate will

1. Understand and proficiently apply the relevant sciences and scientific methods to electrical engineering, to design solutions to complex problems in power system, electrical machines, and control techniques.
2. Identify & synthesize the constraints posed by economic factors, safety considerations, environment impacts & professional standards on electrical engineering practice & use them for professional judgments in solving the critical field problems for sustainable technological development of nation.
3. Determine, analyze & proficiently apply theoretical & numerical analysis of phenomena to conceive, control & optimize the performance of electrical engineering systems used for different applications such as transportation, automobile, process automation, and in navigation.
4. Understand; proficiently apply a system approach for electrical system design and addressing the broad contextual constraints, leading to sustainable development of global level electrical technologies and standards.
5. Develop and implement creative and innovative approaches to enhance the reliability, efficiency, and economical aspect of electrical systems for sustainable improvement of electrical technologies.
6. Use all fundamental knowledge of electrical engineering, science and mathematics to plan, organize and use resources efficiently to reduce the adverse effect on environment.

PROGRAM SPECIFIC OUTCOMES

PSO1. Graduates will demonstrate the ability to apply fundamental knowledge of mathematics, science, and domain knowledge of electrical circuits, fields, control systems, machines, power systems, electronics, programming, power electronics and drives, modern software tools to understand, analyze and design electrical systems.

PSO2. Graduates will be responsible ethical professional with understanding of society linkages and sensitivity towards environment.

PSO3. Graduates will communicate effectively, contribute to the teams, assume leadership, manage project and finance effectively and adapt to the changing needs stepping into self and lifelong learning, will communicate effectively, contribute to the teams, assume leadership, manage project and finance effectively and adapt to the changing needs stepping into self and lifelong learning.

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Course SY EE	Course Outcome:
PART-I Engineering Mathematics-III	1. Students learn about the how to solve mathematical model with Laplace Transform and error functions and their applications. 2. Gain knowledge of Finite and Infinite Fourier Transforms and applications. 3. Familiarize with the concept of analytic function, C-R equations and its uses. 4. Learn about Cauchy's theorem and its uses in complex integration. Taylor's and Laurent's series in complex form. 5. Learn about Cauchy Residues theorem and contour integrations.
PART-I Network Analysis and Synthesis	1. To review basic components of electric network. 2. To design and develop network equations and their solutions. 3. To apply Laplace theorem for electric network analyses 4. To analyze AC circuit.
PART-I Fluid Mechanics and Thermal Engineering	1. To introduce properties of fluid and hydraulic measurement. 2 To understand dynamics of fluid flow. 3. To understand basic concepts of IC engines To understand concept of refrigeration and air conditioning
PART-I Measurement and Instrumentation	1. To understand philosophy of measurement. 2. To understand different methods analog and digital measurement. 3. To study principle of construction and operation of different transducer and dismay methods.
PART-I Electrical Engineering Materials	1. To study about crystal structure 2. To understand magnetic material structure. 3. To study about conducting and superconducting materials. 4. To study dielectric and Nano materials.
PART-I Basic Human Rights	1. To study concept of time value of money. 2. To study about demand in detail. 3.To understand Meaning of Production and factors of production. 4. To understand dif. Concept about market

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PART-II Electrical Machine-I	1. To study diff. types, construction and operating principle of diff. types of electrical machines.
PART-II POWER SYSTEM-I	1. To Understand basic operation of power system. 2. To power system components and their characteristics. 3. To Understand basic Load and Energy survey.
PART-II Electrical Installation and Estimation	1. To prepare estimates and costing of electrical installations of power system. 2. To understand procedures of contracting and purchase
PART-II Numerical Methods and Programming	1. To study and understand MATLAB programming. 2. To review mathematical concepts. 3. To develop computer program for linear and nonlinear equations.
PART-II Product Design Engineering	1. Create simple mechanical or other designs 2. Create design documents for knowledge sharing 3. Manage own work to meet design requirements 4. Work effectively with colleagues
PART-II Solid State Devices	1. To study construction and characteristics of solid state devices. 2. To apply operational amplifier models in circuits employing negative feedback. 3. To design electronics circuit using Timer IC and voltage regulators. 4. To perform analysis of amplifiers using small signal models for the circuit elements. 5. To calculate the frequency response of circuits containing BJT, Op-Amp etc
PART-II Introduction to Non-Conventional energy sources	1. To review energy scenario. 2. To understand basic concepts., construction and operational features of different non-conventional sources

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Course TY EE	Course Outcome:
PART-I Electrical Machine-II	1. To study different methods of speed control of AC and DC motor. 2. To study importance and procedure of different performance test on AC and DC motor. 3. To determine different operating characteristics of AC and DC machines
PART-I Power System-II	1. To study different parameters of power system operation and control 2. To study load flow and Diff. methods of reactive power control. 3. To understand diff. methods of fault analysis and stability study
PART-I Microprocessor and micro Controller	1. To know the architecture of 8085 and 8051. 2. To understand interfacing and interrupt features of 8085 and 8051. 3. To develop program for basic applications.
PART-I Value Education, Human Rights and Legislative Procedures	1. To understand value of education and self-development. 2. To develop good values and character. 3. To know Human right and legislative procedure
PART-I Testing and Maintenance of Electrical equipment.	1. Follow safe practices to prevent accidents while using electrical equipment. 2. Prepare maintenance schedules for electrical equipment. 3. Maintain rotating electrical machines. 4. Maintain single phase and three phase transformers. 5. Maintain insulation systems of electrical equipment.
PART-I Power Plant Engineering.	1. To review basic components of power system, energy sources. 2. To understand principle of construction and operation of different conventional power plants

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PART-II Control System	1. To understand the behavior of nonlinear control system. 2. To design and analyze PID controller. 3. To understand and analyze state variable technique. 4. To design and analyze suitable control system for engineering application.
PART-II Principles of Electrical Machine Design	1. To understand principles of electric machine design. 2. To design different components of electric machine. 3. To design Transformer and understand CAD and use it for transformer design
PART-II Power Electronics	1. To review principle of construction, operation and characteristics of basic semiconductor devices. 2. To understand and analyze performance of controlled and uncontrolled converters. 3. To understand and analyze performance of DC to DC converters. Dc to AC converters. 4. To understand and analyze performance of AC voltage controllers.
PART-II Industrial automation and Control	1. To understand construction and working principle of different industrial measurement systems. 2. To understand new trends in industrial process control.
PART-II Switch Gear and Protection	1. To understand principles of protective relaying. 2. To understand principle of construction, operation and selection of different type of circuit breaker used in power system. 3. To understand different protection schemes used in power system operation

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Course BE EE	Course Outcome:
PART-I Power System Operation & Control	1. Explain the fundamental concept of power system. 2. Design the mathematical model of synchronous machine. 3. Design the mathematical model Excitation system and speed governing system. 4. Analyze the transient stability of power system using swing equation and equal area criteria. 5. Analyze the economic operation of power system. 6. Explain the methods of Voltage control.
PART-I High Voltage Engineering	1. Explain the breakdown process in solid, liquid, and gaseous materials 2. Analyze methods for generation and measurement of High Voltages and Currents (both ac and dc) 3. Describe the phenomenon of over-voltage and choose appropriate insulation coordination levels based on IS & IEC Standards.
PART-I Electrical Drives	1. Analyze the dynamics of Electrical Drives system 2. Use various control techniques for controlling the speed of AC and DC motors. Analyze the AC and DC drives. 3. To Select/recommend the appropriate Drive according to the particular applications. State the recent technology of AC and DC drive
PART-I Special Purpose Electrical Machines	1. Demonstrate construction, working principle, and application of various types of special purpose electrical machines 2. Select a special Machine for a particular application 3. Demonstrate behavior of induction generator and induction machine.
PART-I HVDC Transmission and FACTS	1. To understand importance, configuration and types of HVDC transmission. 2. To analyst the operation of HVDC converter, system control and protection. 3. To understand the concept of FACTS, their role, type and functionality. 4. To analyze the operation of static series and shunt compensator

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PART-II Introduction To Industry 4.0 And Industrial Internet Of Things	1. Knowledge of theory and practice related to Industrial IoT Systems. 2. Ability to identify, formulate and solve engineering problems by using Industrial IoT. 3. Ability to implement real field problem by gained knowledge of Industrial applications with IoT capability.
PART-II Entrepreneurship Essentials	1.Evaluate an idea and assess the market 2. Explore the risks and rewards of entrepreneurship 3. Leverage experiments to validate concepts and refine your business strategy

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Mapping

		Course Code	Course	1	2	3	4	5	6	PSO1	PSO2	PSO3
Second Year	Semester - I	BTBSC301	Engineering Mathematics-III		√	√			√	√	√	√
		BTBSC302	Network Analysis And Synthesis	√	√		√	√		√	√	√
		BTBSC303	Fluid Mechanics And Thermal Engineering		√	√		√		√	√	√
		BTBSC304	Measurement And Instrumentation	√	√		√			√	√	√
		BTEEE305A	Electrical Engineering Materials	√		√	√			√	√	√
		BTHM3401	Basic Human Rights	√	√	√	√			√	√	√
	Semester - II	BTEEC401	Electrical Machine-I	√	√		√			√	√	√
		BTEEC402	Power System-I		√			√	√	√	√	√
		BTEEC403	Electrical Installation And Estimation	√		√	√			√	√	√
		BTEEC404	Numerical Methods And Programming		√	√			√	√	√	√
		BTEEC405	Product Design Engineering	√		√		√		√	√	√
		BTEEE-406A	Solid State Devices	√	√		√			√	√	√
		BTEEOE407-B	Introduction To Non-Conventional Energy Sources		√	√		√	√	√	√	√
Third Year	Semester - I	BTEEC501	Electrical Machine-II		√		√		√	√	√	√
		BTEEC502	Power System-II	√				√	√	√	√	√
		BTEEC503	Microprocessor And Micro Controller	√	√		√			√	√	√
		BTEEC504	Value Education, Human Rights And Legislative Procedures		√			√	√	√	√	√
		BTEEE505	Testing And Maintenance Of Electrical Equipment	√		√	√			√	√	√
		BTEEOE506	Power Plant Engineering		√	√			√	√	√	√
		BTEEC601	Control System	√		√		√		√		√
		BTEEC602	Principles Of Electrical Machine Design	√	√		√			√	√	√

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	Semester - II	BTEEC603	Power Electronics		√	√		√	√	√	√	√
		BTEEE604	Industrial Automation And Control	√	√		√			√	√	√
		BTEEC605	Switch Gear And Protection		√	√		√		√	√	√
Final Year	Semester - I	BTEEC701	Power System Operation & Control		√	√		√	√	√	√	√
		BTEEC702	High Voltage Engineering	√	√		√	√		√	√	√
		BTEEC703	Electrical Drives	√	√		√	√		√	√	√
		BTEEE704	Special Purpose Electrical Machines		√	√		√	√	√	√	√
		BTEEE705	HVDC Transmission and FACTS		√	√		√	√	√	√	√
		BTEES709	Seminar	√	√		√	√		√	√	√
		BTEEP710	Project Part -I	√	√		√	√		√	√	√
	Semester - II		Introduction To Industry 4.0 And Industrial Internet Of Things	√	√		√	√		√	√	√
			Entrepreneurship Essentials		√	√		√		√	√	√
		BTEEP803	Project	√	√		√	√		√	√	√

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P.E.S College of Engineering
Nagsenvana, Aurangabad

Department of Electronics & Telecommunication Engineering

Vision of Institute

To create a sound technical manpower with global competitiveness, morality and social sense.

Mission of Institute

1. To provide state of art technical infrastructure and motivate students to realize their own potential.
2. To provide an embellished academic and congenial environment to students for a complete learning experience.
3. To promote intellectual, moral & social democracy to ensure all round development of the students.

Vision of Department

To be the center of excellence promoting and providing a platform for preparation of globally competitive graduates with proficiency levels with practice and research abilities.

Mission of Department

1. To train and educate students as global citizen to become entrepreneurs in their chosen fields.
2. To promote innovative ideas of the students so as to develop sound technocrats.
3. To impart social responsibilities & ethical foundation in the mind of students.

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Program Educational Objectives :

1. Graduates will able to succeed in positions in engineering practice or research, and in other fields they choose to pursue.

2. Graduates will become a responsible member of society.

3. Graduates will be leaders, both in their chosen profession and in other activities.

4. Graduates will address the complexities of real life engineering problems and be able to formulate solutions that are technically sound, economically feasible & sustainable.

P.E.S. College of Engineering

Principal
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Aurangabad.

Program Outcomes:

Upon successful completion of this course it is expected that electronics graduate will be able to:

a. Understand and proficiently apply the relevant sciences & scientific methods to Electronics engineering to design solutions to complex problems in electronics systems, electronic circuits & control processes.

b. Identify, interpret & critically appraise current developments, advanced technologies and apply them to electronic engineering field to enhance reliability and efficiency of electronics based systems, components and programs.

c. Identify and synthesize the constraints posed by economic factors, safety considerations, environmental impacts and professional standards on Electronics engineering practices and use them for professional judgments in solving the critical field problems for sustainable technological development of nation.

d. Determine, analyze and proficiently apply theoretical and numerical analysis of Phenomenon to
Conceive, control & optimize the performance of Electronics engineering systems used for different applications such as in navigation, automobiles, transportation, and automation.

c. Identify and critically evaluate the performance of a electronics engineering systems in terms of economics, safety, and social and physical environment and implement approaches to minimize any adverse impact leading to sustainable development of society.

d. Understand and proficiently apply a systems approach for electronics system design and addressing the broad contextual constraints, leading to sustainable developments of global level electronics technologies and standards.

g. Show awareness and ability to proficiently apply project management tools and methodologies to the planning and execution of projects leading to electronics engineering solutions of professional standards.

e. Develop & implement creative and innovative approaches to enhance the reliability, efficiency and economical aspect of electronics systems for sustainable improvement of electronics technologies.

i. Communicate effectively on both technical and general issues with peers, associate, clients and the general public to find solutions using technical proficiency.

j Operate effectively and professionally within a team environment to solve complex problems of analyze, design and development of electronics systems.

k. Use all fundamental knowledge of electronics engineering, sciences and mathematics to plan, organize and use resources efficiently to reduce adverse effect on environments.

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Subject: Applied Digital Signal Processing (ADSP)

Course Objectives:

1. This course will introduce the basic concepts and techniques for processing signals on a computer.

2. By the end of the course, students will be familiar with the most important methods in DSP, including digital filter design, transform-domain processing and importance of Signal Processors.

4. The course emphasizes intuitive understanding and practical implementations of the theoretical concepts.

5. To produce graduates who understand how to analyze and manipulate digital signals and have the fundamental Mat lab programming knowledge to do so.

Course Outcomes:

CO 1: Able to know different digital signal, filter techniques and it's algorithms.

CO 2: Able to know multirate signal processing like interpolation and Decimation.

CO 3: To enhance the knowledge of polyphase filter structures and two channel quadrature mirror
filter bank.

CO 4: Need of Adaptive filter, its main components and its algorithms.

CO 5: Able to design Lattice structures AR, MA & ARMA.
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CO 6: Able to represent & calculate the characterization of random signals.

CO 7: Ability to estimate autocorrelation and power spectrum of random signals (Bartlett window
& Welch Method)

CO 8: Ability to know different architecture of DSPs and floating & fixed point representations.

CO 9: Case study of TMS320C54XX and introduction of SHARRC processor.

CO 10: Applications of DSP (Ex. Biomedical, Audio-Video systems, Radar System etc.)

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Mapping of Mission keywords & PEO:

Sr. No.	Keywords	PEO-I	PEO-II	PEO-III	PEO-IV
1.	State of art technical infrastructure	X		X	X
2.	Complete learning experience	X	X	X	X
3.	All round development	X		X	X

Alignment of POs & COs:

PO CO→ ↓	1	2	3	4	5	6	7	8	9	10
a	X		X				X			X
b					X					
c			X		X	X		X	X	X
d	X	X		X	X					
e		X				X			X	
f			X			X			X	X
g		X			X					
h	X	X	X	X	X	X	X	X	X	X
i		X		X		X	X		X	
j				X	X		X		X	
k	X	X	X	X						X

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Syllabus:

Applied Digital Signal Processing (ADSP)

UNIT – I

Multirate Signal Processing :

Sampling rate reduction: Decimation by integer factor, sampling rate increase: interpolation by integer factor, sampling rate conversion by non integer factors, Multistage decimation and multistage interpolation, polyphase filter structures, two channel quadrature mirror filter bank.

UNIT – II

Adaptive Filters:

Need of adaptive filters, adaptive filter as noise cancellation, configuration of adaptive filters, main components of adaptive filters, adaptive algorithms: LMS adaptive algorithms and implementation, recursive least square algorithms.

UNIT – III

Linear Prediction and optimum linear Filters:

Lattice structures, AR, MA, & ARMA, forward & backward linear prediction, different approaches for LPCs: Autocorrelation method, covariance method, Lattice structure method.

Power Spectrum Estimation:

Characterization of random signals: review of deterministic signals, random signals, correlation function, power spectra, DT random signals, Estimation of autocorrelation and power spectrum of random signal, Non parametric method for power spectrum estimation: Bartlett window Welch Method.

UNIT – V

Architectures of DSPs:

Different types of architectures of DSPs, circular buffering, MAC unit, Barrel shifter, special instruction on chip memory, fixed and floating point representations, selections of DSPs, case study of TMS320C54XX, Implementation of basic algorithms like FIR, IIR filters. Introduction to SHARC processor, VLSI algorithms of DSP algorithms.

UNIT – VI

Applications of DSPs:

Applications of multirate signal processing, application of adaptive filters in biomedical (EEG, ECG), radar speech and telephone. Applications of DSP in audio system, Image processing and communication.

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Lesson Plan:

Unit I: Multirate Signal Processing

Pre requisite	Chapter Content	Teaching Plan	Objective
Basics of Multirate Signal Processing	Sampling rate reduction: Decimation by integer factor, sampling rate increase: interpolation by integer factor, sampling rate conversion by non integer factors, Multistage decimation and multistage interpolation, polyphase filter structures, two channel quadrature mirror filter bank.	Study of different digital signal, filter techniques and it's algorithms	1. To know Sampling rate reduction and sampling rate increase by integer factor. 2. To Calculate sampling rate conversion by non integer factors. 3. Able to know difference between general sampling rate conversion and multistage conversion. 4. To know polyphase filter structures and two channel quadrature mirror filter bank
		Decimation and interpolation by integer factor.	
		Multistage decimation and multistage interpolation.	
		What are polyphase filter structures?	
		What is Two channel quadrature mirror filter bank?	

Unit II: Adaptive Filters

Pre requisite	Chapter Content	Teaching Plan	Objective
Basics of Adaptive Filters	Need of adaptive filters, adaptive filter as noise cancellation, configuration of adaptive filters, main components of adaptive filters, adaptive algorithms: LMS adaptive algorithms and implementation, recursive least square algorithms.	Study need of adaptive filters.	1. Able to know adaptive filter and its use. 2. To configure adaptive filters. 3. Should be able to know main components of adaptive filters. 4. Able to analyze and generate algorithms of adaptive filters. 5.To know different algorithms of adaptive filters like LMS and recursive least square algorithms.
		Discussion of adaptive filter as noise cancellation	
		Configuration of adaptive filters	
		Discussion of main components of adaptive filters	
		What is adaptive algorithms: LMS adaptive algorithms	
		Implementation of recursive least square algorithms.	

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UNIT-III: Linear Prediction and optimum linear Filters

Pre requisite	Chapter Content	Teaching Plan	Objective
Basics of Prediction and Optimization, then Linear Prediction and optimum linear Filters	Lattice structures, AR, MA, & ARMA, forward & backward linear prediction, different approaches for LPCs: Autocorrelation method, covariance method, Lattice structure method.	What is Lattice structure?	1. To know about lattice structure and AR,MA & ARMA. 2. Able to predict linear and optimum linear filters. 3.Able to aware about different approach for LPCs like autocorrelation, covariance and lattice structure method.
		What are AR, MA, & ARMA?	
		forward & backward linear prediction	
		Study different approaches for LPCs	
		Autocorrelation method, covariance method, Lattice structure method.	

UNIT-IV: Power Spectrum Estimation

Pre requisite	Chapter Content	Teaching Plan	Objective
Power Spectrum Estimation	Characterization of random signals: review of deterministic signals, random signals, correlation function, power spectra, DT random signals, Estimation of autocorrelation and power spectrum of random signal, Non parametric method for power spectrum estimation: Bartlett window Welch Method.	Study of characterization of different types of random signals.	1. Able to characterize the different types of random signals. 2. To estimate autocorrelation and power spectrum of random signal. 3.To analyze parametric method method for power spectrum estimation like Bartlett window Welch Method
		Correlation function, power spectra, DT random signals	
		What is estimation of autocorrelation and power spectrum of random signal	
		Discussion of non parametric method for power spectrum estimation:	
		Bartlett window Welch Method	

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UNIT-V: Architectures of DSPs

Pre requisite	Chapter Content	Teaching Plan	Objective
Basic architecture of DSP	Different types of architectures of DSPs, circular buffering, MAC unit, Barrel shifter, special instruction on chip memory, fixed and floating point representations, selections of DSPs, case study of TMS320C54XX, Implementation of basic algorithms like FIR, IIR filters. Introduction to SHARC processor, VLSI algorithms of DSP algorithms	Study of Different types of architectures of DSPs.	1. Able to know basic architecture of DSP as well as different types of architectures of DSPs. 2. Idea about circular buffering, MAC unit, Barrel shifter, and special instruction on chip memory should be clear. 3. Should know difference between fixed and floating point representations. 4. Able to know TMS320C54XX as well as all types of DSPs. 5. To analyze VLSI algorithms of DSP.
		Discussion of circular buffering, MAC unit, Barrel shifter, special instruction on chip memory	
		What are fixed and floating point representations & selections of DSPs?	
		Case study of TMS320C54XX	
		Implementation of basic algorithms like FIR, IIR filters	
		Introduction to SHARC processor, VLSI algorithms	

UNIT-VI: Applications of DSPs

Pre requisite	Chapter Content	Teaching Plan	Objective
Applications of DSPs	Applications of multirate signal processing, application of adaptive filters in biomedical (EEG, ECG), radar speech and telephone. Applications of DSP in audio system, Image processing and communication.	Study of roll of DSPs in different field.	1. Able to know Study of roll of DSPs in different field 2. Able to know applications of adaptive filters in biomedical (EEG, ECG) 3. Applications in radar speech and telephone 4. Applications of DSP in audio system, Image processing and communication.
		What are the applications of adaptive filters in biomedical (EEG, ECG)	
		Applications in radar speech and telephone	
		What are the applications of DSP in audio system, Image processing and communication?	

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Course Objectives For TY ETC (PART I I 2020-21)

SEM VI

Sr.No.	Subject Code	Course Name	Course Objectives
1	BTETC601	Antennas and Wave Propagation	1. To understand the applications of electromagnetic engineering. 2. To formulate and solve the Helmholtz wave equation and solve it for Uniform Plane Wave. 3. To analyze and understand the Uniform plane wave propagation in various media. 4. To solve the electric field and magnetic fields for a given wire antenna.
2	BTETC602	Computer Network & Cloud Computing	1. To develop an understanding of modern network architectures from a design and performance perspective. 2. To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs). 3. To provide an opportunity to do network programming 4. To provide a WLAN measurement ideas.
3	BTETC603	Digital Image Processing	1. An ability to use current techniques, skills, and tools necessary for computing practice with an understanding of the limitations
4	BTETPE604C Program Elective	Power Electronics	1.To introduce students to different power devices to study their construction, characteristics and turning on circuits.

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			2.To give an exposure to students of working & analysis of controlled rectifiers for different loads, inverters, DC choppers, AC voltage controllers and resonant converters. 3.To study the different motor drives, various power electronics applications like UPS, SMPS, etc. and some protection circuits.
5	BTETOE605A Open Elective	Digital System Design	1. The concept and theory of digital Electronics are needed in almost all electronics and telecommunication engineering fields and in many other engineering and scientific disciplines as well. 2. The main objective of this course is to lay the foundation for further studies in areas such as communication, VLSI, computer, microprocessor etc. One of the most important reasons for the unprecedented growth of digital electronics is the advent of integrated circuit. 3. This course will explore the basic concepts of digital electronics.
6	BTHM606	Employability & Skill Development	1. To develop analytical abilities. 2. To develop communication skills. 3. To introduce the students to skills necessary for getting, keeping and being successful in a profession.

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4.To expose the students to leadership and team-building skills.

Course Objectives For TY ETC (PART I 2020-21)

SEM V

Sr.No.	Subject Code	Course Name	Course Objectives
1	BTEXC501	Electromagnetic Field Theory	1. Learners can be able to explore their knowledge in the area of EM Waves and its analysis. 2. To learn basic coordinate system, significance of divergence, gradient, curl and its applications to EM Waves. 3. To understand the boundary conditions for different materials /surfaces. 4. To get insight on finding solution for non-regular geometrical bodies using Finite Element Method, Method of Moments, Finite Difference Time Domain. 5. To get the basics of microwave, transmission lines and antenna parameters. 6. Students get acquainted with different physical laws and theorems and provide basic platform for upcoming communication technologies.
2	BTEXC502	Control System Engineering	1. To introduce the elements of control system and their modeling using various Techniques. 2. To introduce methods for analyzing the time response, the frequency response and the stability of systems.

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			3.To introduce the concept of root locus, Bode plots, Nyquist plots. 4.To introduce the state variable analysis method. 5. To introduce concepts of PID controllers and digital and control systems. 6. To introduce concepts programmable logic controller.
4	BTETC503	Computer Architecture	1. To introduce basic concepts of computer organization and to illustrate the computer organization concepts by Assembly Language programming. 2. To understand operating systems and how they work with the computer and students will understand the relationship between hardware and software specifically how machine organization impacts the efficiency of applications written in a high-level language. 3. Students will be able to make use of the binary number system to translate values between the binary and decimal number systems, to perform basic arithmetic operations and to construct machine code instructions and students will be able to design and implement solutions for basic programs using assembly language. 4. Students will be able to design logical expressions and

			corresponding integrated logic circuits for a variety of problems including the basic components of a CPU such as adders, multiplexers, the ALU, a register file, and memory cells and to explain the fetch- execute cycle performed by the CPU and how the various components of the data path are used in this process.
5	BTEXC504	Digital Signal Processing	1. To introduce students with transforms for analysis of discrete time signals and systems. 2.To understand the digital signal processing, sampling and aliasing. 3.To use and understand implementation of digital filters. 4.To understand concept of sampling rate conversion and DSP processor architecture.
6	BTEXC505	Microcontroller and its Applications	1.Objective of this course is to introduce to the students the fundamentals of microcontroller. 2. After learning Microprocessor course, students will get advantage to pursue higher studies in Embedded Systems or employment in core industries. 3. The learner can microcontroller design based systems and thus can become successful entrepreneur and meet needs of Indian and multinational industries. 4. The students can design and develop processor which can be used in Robotics, Automobiles, Space and many research areas.

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			5.The learners will acquaint optimization skills and undergo concepts design metrics for embedded systems. 6.The students will get acquainted with recent trends in microcontroller like pipelining, cache memory etc. 7.To understand the applications of Microcontrollers. 8. To understand need of microcontrollers in embedded system. 9.To understand architecture and features of typical Microcontroller. 10. To learn interfacing of real world input and output devices. 11.To study various hardware and software tools for developing applications.
7	BTEXPE506D	Introduction to MEMS	1. The objective of this course is to make students to gain basic knowledge on overview of MEMS (Micro electro Mechanical System) and various fabrication techniques. 2. This enables them to design, analysis, fabrication and testing the MEMS based components and to introduce the students various opportunities in the emerging field of MEMS. 3. This will enables student to study applications of micro-sensors and micro-actuators, various MEMS fabrication technologies, MEMS-specific design issues and constraints,

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			Dynamics and modeling of microsystems, getting access to fabrication and testing in academia and industry.

Course Objectives For SY ETC (PART I 2020-21)

SEM III

Sr.No.	Subject Code	Course Name	Course Objectives
1	BTBSC301	Engineering Mathematics-III	1. Linear differential equations of higher order using analytical methods and numerical methods applicable to Control systems and Network analysis. 2.Transforms such as Fourier transform, Laplace transform and applications to Communication systems and Signal processing. 3.Vector differentiation and integration required in Electromagnetics and Wave theory.
2	BTEXC302	Analog Circuits	1. To understand characteristics of IC and Op-Amp and identify the internal structure. 2. To introduce various manufacturing techniques. 3. To study various op-amp parameters and their significance for Op-Amp. 4. To learn frequency response, transient response and frequency compensation techniques for Op-Amp. 5. To analyze and identify linear and nonlinear applications of Op-Amp. 6 To understand functionalities of PLL.
3	BTEXC303	Electronic Devices & Circuits	1. To introduce semiconductor

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			devices FET and MOSFET, their characteristics, operations, circuits and applications 2.To introduce concepts of both positive and negative feedback in electronic circuits 3.To analyze and interpret FET and MOSFET circuits for small signal at low and high frequencies 4.To simulate electronics circuits using computer simulation software and verify desired results 5.To study the different types of voltage regulators.
4	BTEXC304	Network Analysis	1.To learn about the basic laws of electric circuits as well as the key fundamentals of the communication channels, namely transmission lines. 2. To understand the need of simplification techniques of complicated circuits 3.To learn about the comprehensive insight into the principle techniques available for characterizing circuits, networks and their implementation in practice. 4.To learn about the use of mathematics, need of different transforms and usefulness of differential equations for analysis of networks.
5	BTEXC305	Digital Logic Design	1. To acquaint the students with the fundamental principles of two-valued logic and various devices used to implement logical

operations on variables.

2. To lay the foundation for further studies in areas such as communication, VHDL, computer.

Course Objectives For SY ETC (PART I 2020-21)

SEM IV

Sr.No.	Subject Code	Course Name	Course Objectives
1	BTEXC401	Electrical Machines and Instruments	1.Model and Analyze the performance of different types of DC machines 2. Learn the applications of DC generators 3. Analyze the performance of different types of DC motors 4. Analyze the performance of different types of Sensors and Transducers 5. Familiarize with the applications of DC machines 6. To prepare students to perform the analysis of any electromechanical system. 7. To empower students to understand the working of electrical equipment used in everyday life.
2	BTEXC402	Analog Communication Engineering	1.To introduce the concepts of analog communication systems. 2. To equip students with various issues related to analog communication such as modulation, demodulation, transmitters and receivers and noise performance. 3. To understand the concepts of modulation and demodulation techniques of angle modulation (frequency and phase)
3	BTEXC403	Microprocessor	1.Objective of this course is to introduce to the students the fundamentals of microprocessor 2After learning Microprocessor course, students will get advantage to pursue higher studies in Embedded Systems or employment in core industries. 3. The learner can design microprocessor based systems and thus can become successful entrepreneur and meet needs of Indian and multinational industries.

			4. The students can design and develop processor which can be used in Robotics, Automobiles, Space and many research areas. 5. The learners will acquaint optimization skills and undergo concepts design metrics for embedded systems. 6. The students will get acquainted with recent trends in microprocessor like pipelining, cache memory etc. 7. To understand the applications of Microprocessors. 8. To learn interfacing of real world input and output devices. 9. To study various hardware and software tools for developing applications
4	BTEXC404	Signals and Systems	1.To understand the mathematical description of continuous and discrete time signals and systems. 2. To classify signals into different categories. 3. To analyze Linear Time Invariant (LTI) systems in time and transform domains. 4. To build basics for understanding of courses such as signal processing, control system and communication. 5. To develop basis of probability and random variables
5	BTID405	Product Design Engineering	1. Create simple mechanical or other designs 2. Create design documents for knowledge sharing 3. Manage own work to meet design requirements 4. Work effectively with colleagues
6	BTBSC406	Numerical Methods and Computer Programming	1.To prepare students for successful career in industries, for Post Graduate programmes and to work in research institutes. 2. To understand different numerical techniques used for solving algebraic and transcendental equations. 3. To understand numerical methods to solve a system of linear equations. 4. To understand numerical integration and differentiation techniques. To understand various difference operators and interpolation techniques.

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6. To understand object-oriented programming fundamentals and features.
7. To mold students professionally by course contents and sufficient problem solving
and programming exercises and to acquaint them with different types of numerical techniques and programming concepts

Course Objectives For BE ETC (PART I 2020-21)

SEM VII

Sr.No.	Subject Code	Course Name	Course Objectives
1	BTETC701	Digital Communication	1.To understand the building blocks of digital communication system. – To prepare mathematical background for communication signal analysis. – To understand and analyze the signal flow in a digital communication system. – To analyze error performance of a digital communication system in presence of noise and other interferences. – To understand concept of spread spectrum communication system.
2	BTETPE702	Fiber Optic Communication	To learn the basic elements of optical fiber transmission link, fiber modes configurations and structures. – To understand the different kind of losses, signal distortion in optical wave guides and other signal degradation factors. – To learn the various optical source materials, LED structures, quantum efficiency, Laser diodes – Understand the functionality of each of the components that comprise a fiber-optic communication system: transmitter, fiber, amplifier, and receiver. – Understand the properties of optical fiber that affect the performance of a communication link. – Understand basic optical amplifier operation and its effect on signal power and noise in the system. – Apply concepts listed above to the design of a basic communication link.

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3	BTETPE703	Embedded System Design	To understand the embedded system design issues. – To learn real time operating system concepts. – To understand the Embedded Linux environment. – To learn embedded software development and testing process

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Program Outcomes

At the end of the program the student will be able to:

PO 1	Apply the knowledge of mathematics, basic sciences, and mechanical engineering to the solution of complex engineering problems.
PO 2	Identify, formulate, research literature, and analyze complex mechanical engineering problems reaching substantiated conclusions.
PO 3	Design solutions for complex engineering problems and design mechanical system components that meet the specified needs.
PO 4	Use mechanical engineering research-based knowledge related to interpretation of data and provide valid conclusions.
PO 5	Create, select, and apply modern mechanical engineering and IT tools to complex engineering activities with an understanding of the limitations.
PO 6	Apply reasoning acquired by the mechanical engineering knowledge to assess societal and safety issues.
PO 7	Understand the impact of engineering solutions on the environment, and demonstrate the knowledge for sustainable development.
PO 8	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communicate effectively on complex engineering activities with the engineering community and with society at large.
PO 11	Understand the engineering and management principles and apply these to the multidisciplinary environments.
PO 12	Recognize the need for life-long learning in the broadest context of technological change.

Program-Specific Outcomes (PSOs)

PSO 1	Make the students employable in engineering industries.
PSO 2	Motivate the students for higher studies and research.

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BTEXC302 Analog Circuits

Course Objectives:
To understand characteristics of IC and Op-Amp and identify the internal structure.
To introduce various manufacturing techniques.
To study various op-amp parameters and their significance for Op-Amp.
To learn frequency response, transient response and frequency compensation techniques for Op-Amp.
To analyze and identify linear and nonlinear applications of Op-Amp. To understand functionalities of PLL.

Course Outcomes:
On completion of the course, students will be able to:
1. Understand the characteristics of IC and Op-Amp and identify the internal structure.
2. Understand and identify various manufacturing techniques.
3. Derive and determine various performances based parameters and their significance for Op-Amp.
4. Comply and verify parameters after exciting IC by any stated method.
5. Analyze and identify the closed loop stability considerations and I/O limitations.
6. Analyze and identify linear and nonlinear applications of Op-Amp.
7. Understand and verify results (levels of V & I) with hardware implementation.
8. Implement hardwired circuit to test performance and application for what it is being designed.
9. Understand and apply the functionalities of PLL.

BTEXC303 Electronic Devices & Circuits

Course Objectives:
1. To introduce semiconductor devices FET and MOSFET, their characteristics, operations, circuits and applications
2. To introduce concepts of both positive and negative feedback in electronic circuits
3. To analyze and interpret FET and MOSFET circuits for small signal at low and high frequencies
4. To simulate electronics circuits using computer simulation software and verify desired results
5. To study the different types of voltage regulators.

Course Outcomes:
On completion of the course, students will be able to:
1. Comply and verify parameters after exciting devices by any stated method.
2. Implement circuit and test the performance.
3. Analyze small signal model of FET and MOSFET.
4. Explain behavior of FET at low frequency.
5. Design an adjustable voltage regulator circuits.

BTEXC304 Network Analysis

Course Objectives: 1. To learn about the basic laws of electric circuits as well as the key fundamentals of the communication channels, namely transmission lines. 2. To understand the need of simplification techniques of complicated circuits 3. To learn about the comprehensive insight into

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the principle techniques available for characterizing circuits, networks and their implementation in practice. 4. To learn about the use of mathematics, need of different transforms and usefulness of differential equations for analysis of networks.
5. To train the students for handling analog filter design through theory of NA along with practical, this is basic requirement of signal processing field.

Course Outcomes:
On completion of the course, students will be able to:
1. Apply knowledge of mathematics to solve numerical based on network simplification and it will be used to analyze the same.
2. Design passive filters and attenuators theoretically and practically. To apply knowledge for design of active filters as well as digital filters and even extend this to advance adaptive filters.
3. Identify issues related to transmission of signals, analyze different RLC networks.
4. Find technology recognition for the benefit of the society

BTEXC305 Digital Logic Design

Course Objectives:
1. To acquaint the students with the fundamental principles of two-valued logic and various devices used to implement logical operations on variables.
2. To lay the foundation for further studies in areas such as communication, VHDL, computer.

Course Outcomes:
On completion of the course, students will be able to:
1. Use the basic logic gates and various reduction techniques of digital logic circuit in detail.
2. Design combinational and sequential circuits.
3. Design and implement hardware circuit to test performance and application.
4. Understand the architecture and use of VHDL for basic operations and Simulate using simulation software.

BTHM3401 Basic Human Rights

Course Objectives:
1. To work for ensuring that basic human rights are respected everywhere.
2. To cooperate to avoid compromising on human rights for economic or political expediency
3. To recognize democratic institutions as a fundamental human right
4. To work towards the sovereignty and self-determination of entities with historical, cultural and ecological identity.
5. To actively engage with the Government of India and other countries to promote human rights education.
6. To bring diplomatic and commercial pressures on regimes that violates human rights, to ensure that they respect the basic rights of their citizens.
7. To keep the interests of disempowered communities foremost in all dealings with countries in which human rights violations occur
8. To develop a more distinctive and effective role for the International Court of Justice in the field of human rights
9. To promote a culture for educating the citizenry that cultivation and promotion of human rights culture is the sine qua non for the smooth functioning of the organs of a democratic State and for the kind of development that results into overall development of the society.
10. To train the young men and women for facing the challenges of the pluralistic society and the rising conflicts and tensions in the name of particularistic loyalties to caste, religion, region and culture

11. To study the effects of draconian laws and unlawful use of State's machinery and force by the enforcement agencies.

Course Outcomes:
On completion of the course, students will be able to:
1. Simply put, human rights education is all learning that develops the knowledge, skills, and values of human rights.
2. Strengthen the respect for human rights and fundamental freedoms.
3. Enable all persons to participate effectively in a free society.
4. Learn about human rights principles, such as the universality, indivisibility, and interdependence of human rights.
5. Learn about regional, national, state, and local law that reinforces international human rights law.
6. Learn and know about and being able to use global, regional, national, and local human rights instruments and mechanisms for the protection of human rights.

BTEXC401 Electrical Machines and Instruments

Course Objectives:
1. Model and Analyze the performance of different types of DC machines
2. Learn the applications of DC generators
3. Analyze the performance of different types of DC motors
4. Analyze the performance of different types of Sensors and Transducers
5. Familiarize with the applications of DC machines
6. To prepare students to perform the analysis of any electromechanical system.
7. To empower students to understand the working of electrical equipment used in everyday life.

Course Outcomes:
On completion of the course, students will be able to:
1. The ability to formulate and then analyze the working of any electrical machine using mathematical model under loaded and unloaded conditions.
2. The skill to analyze the response of any electrical machine.
3. The ability to troubleshoot the operation of an electrical machine.
4. The ability to select a suitable measuring instrument for a given application.
5. The ability to estimate and correct deviations in measurements due to the influence of the instrument and due to the accuracy of the instrument.

BTEXC402 Analog Communication Engineering

Course Objectives:
1. To introduce the concepts of analog communication systems.
2. To equip students with various issues related to analog communication such as modulation, demodulation, transmitters and receivers and noise performance.
3. To understand the concepts of modulation and demodulation techniques of angle modulation (frequency and phase)

Course Outcomes:
On completion of the course, students will be able to:
1. Understand and identify the fundamental concepts and various components of analog communication systems.
2. Understand the concepts of modulation and demodulation techniques.

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3. Design circuits to generate modulated and demodulated wave.
4. Equip students with various issues related to analog communication such as modulation, demodulation, transmitters and receivers and noise performance.
5. Understand the concepts of modulation and demodulation techniques of angle modulation (frequency and phase).
6. Explain signal to noise ratio, noise figure and noise temperature for single and cascaded stages in a communication system.
7. Develop the ability to compare and contrast the strengths and weaknesses of various communication systems.

BTEXC403 Microprocessor

Course Objectives:
1. Objective of this course is to introduce to the students the fundamentals of microprocessor.
2. After learning Microprocessor course, students will get advantage to pursue higher studies in Embedded Systems or employment in core industries.
3. The learner can design microprocessor based systems and thus can become successful entrepreneur and meet needs of Indian and multinational industries.
4. The students can design and develop processor which can be used in Robotics, Automobiles, Space and many research areas.
5. The learners will acquaint optimization skills and undergo concepts design metrics for embedded systems.
6. The students will get acquainted with recent trends in microprocessor like pipelining, cache memory etc.
7. To understand the applications of Microprocessors.
8. To learn interfacing of real world input and output devices.
9. To study various hardware and software tools for developing applications.

Course Outcomes:
1. Learner gains ability to apply knowledge of engineering in designing different case studies.
2. Students get ability to conduct experiments based on interfacing of devices to or interfacing to real world applications.
3. Students get ability to interface mechanical system to function in multidisciplinary system like in robotics, Automobiles.
4. Students can identify and formulate control and monitoring systems using microprocessors.
5. Students will design cost effective real time system to serve engineering solution for Global, social and economic context.
6. This course understanding will enforce students to acquire knowledge of recent trends like superscalar and pipelining and thus finds recognition of continuous updation.
7. Learn use of hardware and software tools.
8. Develop interfacing to real world devices.

BTEXC404 Signals and Systems

Course Objectives:
1. To understand the mathematical description of continuous and discrete time signals and systems.
2. To classify signals into different categories.
3. To analyze Linear Time Invariant (LTI) systems in time and transform domains

4. To build basics for understanding of courses such as signal processing, control system and communication.
5. To develop basis of probability and random variables.

Course Outcomes:
On completion of the course, students will be able to:
1. Understand mathematical description and representation of continuous and discrete time signals and systems.
2. Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system.
3. Understand and resolve the signals in frequency domain using Fourier series and Fourier transforms.
4. Understand the limitations of Fourier transform and need for Laplace transform and develop the ability to analyze the system in s- domain.
5. Understand the basic concept of probability, random variables & random signals and develop the ability to find correlation, CDF, PDF and probability of a given event.

BTID405 Product Design Engineering

Course Outcomes:
At the end of the course, students will be able to
1. Create simple mechanical or other designs
2. Create design documents for knowledge sharing
3. Manage own work to meet design requirements
4. Work effectively with colleagues.

BTEXC501 Electromagnetic Field Theory

Course Objectives:
Learners can be able to explore their knowledge in the area of EM Waves and its analysis.
To learn basic coordinate system, significance of divergence, gradient, curl and its applications to EM Waves.
To understand the boundary conditions for different materials /surfaces.
To get insight on finding solution for non-regular geometrical bodies using Finite Element Method, Method of Moments, Finite Difference Time Domain.
To get the basics of microwave, transmission lines and antenna parameters.
Students get acquainted with different physical laws and theorems and provide basic platform for upcoming communication technologies.

Course Outcomes:
At the end of this course students will demonstrate the ability to
1. Understand characteristics and wave propagation on high frequency transmission lines
2. Carryout impedance transformation on TL
3. Use sections of transmission line sections for realizing circuit elements
4. Characterize uniform plane wave
5. Calculate reflection and transmission of waves at media interface
6. Analyze wave propagation on metallic waveguides in modal form
7. Understand principle of radiation and radiation characteristics of an antenna

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BTEXC502 Control System Engineering

Course Objectives:

To introduce the elements of control system and their modeling using various Techniques.

To introduce methods for analyzing the time response, the frequency response and the stability of systems.

To introduce the concept of root locus, Bode plots, Nyquist plots.

To introduce the state variable analysis method.

To introduce concepts of PID controllers and digital and control systems.

To introduce concepts programmable logic controller.

Course Outcomes:

At the end of this course, students will demonstrate the ability to

1. Understand the modeling of linear-time-invariant systems using transfer function and state-space representations.
2. Understand the concept of stability and its assessment for linear-time invariant systems.
3. Design simple feedback controllers.

BTETC503 Computer Architecture

Course Objectives:

To introduce basic concepts of computer organization and to illustrate the computer organization concepts by Assembly Language programming.

To understand operating systems and how they work with the computer and students will understand the relationship between hardware and software specifically how machine organization impacts the efficiency of applications written in a high-level language.

Students will be able to make use of the binary number system to translate values between the binary and decimal number systems, to perform basic arithmetic operations and to construct machine code instructions and students will be able to design and implement solutions for basic programs using assembly language.

Students will be able to design logical expressions and corresponding integrated logic circuits for a variety of problems including the basic components of a CPU such as adders, multiplexers, the ALU, a register file, and memory cells and to explain the fetchexecute cycle performed by the CPU and how the various components of the data path are used in this process.

Course Outcomes: At the end of this course students will demonstrate the ability to

1. learn how computers work
2. know basic principles of computer‟s working
3. analyze the performance of computers 4. know how computers are designed and built
5. Understand issues affecting modern processors (caches, pipelines etc.).

BTEXC504 Digital Signal Processing

Course Objectives:

To introduce students with transforms for analysis of discrete time signals and systems.

To understand the digital signal processing, sampling and aliasing.

To use and understand implementation of digital filters.

To understand concept of sampling rate conversion and DSP processor architecture.

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Course Outcomes:
After successfully completing the course students will be able to
1. Understand use of different transforms and analyze the discrete time signals a
2. Realize the use of LTI filters for filtering different real world signals.
3. Capable of calibrating and resolving different frequencies existing in any signal.
4. Design and implement multistage sampling rate converter.
5. Design of different types of digital filters for various applications.

BTEXC505 Microcontroller and its Applications

Course Objectives:
Objective of this course is to introduce to the students the fundamentals of microcontroller.
After learning Microprocessor course, students will get advantage to pursue higher studies in Embedded Systems or employment in core industries.
The learner can microcontroller design based systems and thus can become successful entrepreneur and meet needs of Indian and multinational industries.
The students can design and develop processor which can be used in Robotics, Automobiles, Space and many research areas.
The learners will acquaint optimization skills and undergo concepts design metrics for embedded systems.
The students will get acquainted with recent trends in microcontroller like pipelining, cache memory etc.
To understand the applications of Microcontrollers.
To understand need of microcontrollers in embedded system.
To understand architecture and features of typical Microcontroller. T
o learn interfacing of real world input and output devices.
To study various hardware and software tools for developing applications.

Course Outcomes:
1. Learner gains ability to apply knowledge of engineering in designing different case studies.
2. Students get ability to conduct experiments based on interfacing of devices to or interfacing to real world applications.
3. Graduates will be able to design real time controllers using microcontroller based system.
4. Students get ability to interface mechanical system to function in multidisciplinary system like in robotics, Automobiles.
5. Students can identify and formulate control and monitoring systems using microcontrollers.
6. Students will design cost effective real time system to serve engineering solution for Global, social and economic context.
7. Learners get acquainted with modern tools like Programmers, Debuggers, cross compilers and current IDE i.e. integrated development environment tools.
8. Learn importance of microcontroller in designing embedded application.
9. Learn use of hardware and software tools.
10. Develop interfacing to real world devices.

BTEXPE506D Introduction to MEMS

Course Objectives:
The objective of this course is to make students to gain basic knowledge on overview of MEMS (Micro electro Mechanical System) and various fabrication techniques.
This enables them to design, analysis, fabrication and testing the MEMS based components and to

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introduce the students various opportunities in the emerging field of MEMS.
This will enables student to study applications of micro-sensors and micro-actuators, various MEMS fabrication technologies, MEMS-specific design issues and constraints, Dynamics and modeling of microsystems, getting access to fabrication and testing in academia and industry.

Course Outcomes:
At the end of the course the students will be able to
1. Appreciate the underlying working principles of MEMS and NEMS devices.
2. Design and model MEM devices.

BTETC601 Antennas and Wave Propagation

Course Objectives:
To understand the applications of electromagnetic engineering.
To formulate and solve the Helmholtz wave equation and solve it for Uniform Plane Wave.
To analyze and understand the Uniform plane wave propagation in various media.
solve the electric field and magnetic fields for a given wire antenna.

Course Outcomes: After successfully completing the course students will be able to
1. Formulate the wave equation and solve it for uniform plane wave.
2. Analyze the given wire antenna and its radiation characteristics.
3. Identify the suitable antenna for a given communication system

BTETC602 Computer Network & Cloud Computing

Course Objectives:
To develop an understanding of modern network architectures from a design and performance perspective.
To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs).
To provide an opportunity to do network programming
To provide a WLAN measurement ideas.

Course Outcomes:
1. To master the terminology and concepts of the OSI reference model and the TCP-IP reference model.
2. To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.
3. To be familiar with wireless networking concepts.
4. To be familiar with contemporary issues in networking technologies.
5. To be familiar with network tools and network programming.
6. For a given requirement (small scale) of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) design it based on the market available component.
7. For a given problem related TCP/IP protocol developed the network programming.
8. Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.

BTETC603 Digital Image Processing

Course Objectives:

An ability to use current techniques, skills, and tools necessary for computing practice with an understanding of the limitations

Course Outcomes:
After completion of this course students will be able to
1. Review the fundamental concepts of digital image processing system.
2. Analyze images in the frequency domain using various transforms.
3. Categories various compression techniques.
4. Interpret image segmentation and representation techniques.

BTETC701 Digital Communication

Course Objectives:
To understand the building blocks of digital communication system.
To prepare mathematical background for communication signal analysis.
To understand and analyze the signal flow in a digital communication system.
To analyze error performance of a digital communication system in presence of noise and other interferences.
To understand concept of spread spectrum communication system.

Course Outcomes:
1. Analyze the performance of a baseband and pass band digital communication system in terms of error rate and spectral efficiency.
2. Perform the time and frequency domain analysis of the signals in a digital communication system.
3. Select the blocks in a design of digital communication system.
4. Analyze Performance of spread spectrum communication system.

BTETPE702D Fiber Optic Communication

Course Objectives:
To learn the basic elements of optical fiber transmission link, fiber modes configurations and structures.
To understand the different kind of losses, signal distortion in optical wave guides and other signal degradation factors.
To learn the various optical source materials, LED structures, quantum efficiency, Laser diodes
Understand the functionality of each of the components that comprise a fiber-optic communication system: transmitter, fiber, amplifier, and receiver.
Understand the properties of optical fiber that affect the performance of a communication link.
Understand basic optical amplifier operation and its effect on signal power and noise in the system.
Apply concepts listed above to the design of a basic communication link.

Course Outcomes:
At the end of the course, students will demonstrate the ability to:
1. Understand the principles fiber-optic communication, the components and the bandwidth advantages.
2. Understand the properties of the optical fibers and optical components.
3. Understand operation of lasers, LEDs, and detectors.
4. Analyze system performance of optical communication systems.
5. Design optical networks and understand non-linear effects in optical fibers

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BTETPE703A Embedded System Design

Course Objectives:
To understand the embedded system design issues.
To learn real time operating system concepts.
To understand the Embedded Linux environment.
To learn embedded software development and testing process.

Course Outcomes:
At the end of the course, students will demonstrate the ability to:
1. Suggest design approach using advanced controllers to real-life situations.
2. Design interfacing of the systems with other data handling / processing systems.
3. Appreciate engineering constraints like energy dissipation, data exchange speeds etc.
4. Get to know the hardware – software co design issues and testing methodology for embedded system.

Electronics & Telecommunication Department

Program Outcomes

Upon successful completion of this course it is expected that electronics graduate will be able to:

a. Understand and proficiently apply the relevant sciences & scientific methods to Electronics engineering to design solutions to complex problems in electronics systems, electronic circuits & control processes.

b. Identify, interpret & critically appraise current developments, advanced technologies and apply them to electronic engineering field to enhance reliability and efficiency of electronics based systems, components and programs.

c. Identify and synthesize the constraints posed by economic factors, safety considerations, environmental impacts and professional standards on Electronics engineering practices and use them for professional judgments in solving the critical field problems for sustainable technological development of nation.

d. Determine, analyze and proficiently apply theoretical and numerical analysis of Phenomenon to conceive, control & optimize the performance of Electronics engineering systems used for different applications such as in navigation, automobiles, transportation, and automation.

e. Identify and critically evaluate the performance of a electronics engineering systems in terms of economics, safety, and social and physical environment and implement approaches to minimize any adverse impact leading to sustainable development of society.

f. Understand and proficiently apply a systems approach for electronics system design and addressing the broad contextual constraints, leading to sustainable developments of global level electronics technologies and standards.

g. Show awareness and ability to proficiently apply project management tools and methodologies to the planning and execution of projects leading to electronics engineering solutions of professional standards.

h. Develop & implement creative and innovative approaches to enhance the reliability, efficiency and economical aspect of electronics systems for sustainable improvement of electronics technologies.

i. Communicate effectively on both technical and general issues with peers, associate, clients and the general public to find solutions using technical proficiency.

j Operate effectively and professionally within a team environment to solve complex problems of analyze, design and development of electronics systems.

k. Use all fundamental knowledge of electronics engineering, sciences and mathematics to plan, organize and use resources efficiently to reduce adverse effect on environments.

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Course Outcomes of ESD:

At the end of the course, students will demonstrate the ability to:

1. Suggest design approach using advanced controllers to real-life situations.

2. Design interfacing of the systems with other data handling / processing systems.

3. Appreciate engineering constraints like energy dissipation, data exchange speeds etc.

4. Get to know the hardware – software co design issues and testing methodology for embedded system.

Mapping of Course outcomes and Program Outcomes

Course Outcome	Program Outcome
1	b, c, i, j, k
2	d, j, k
3	a, b, c
4	e, g, j

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Electronics & Telecommunication Department

Program Outcomes

Upon successful completion of this course it is expected that electronics graduate will be able to:

a. Understand and proficiently apply the relevant sciences & scientific methods to Electronics engineering to design solutions to complex problems in electronics systems, electronic circuits & control processes.

b. Identify, interpret & critically appraise current developments, advanced technologies and apply them to electronic engineering field to enhance reliability and efficiency of electronics based systems, components and programs.

c. Identify and synthesize the constraints posed by economic factors, safety considerations, environmental impacts and professional standards on Electronics engineering practices and use them for professional judgments in solving the critical field problems for sustainable technological development of nation.

d. Determine, analyze and proficiently apply theoretical and numerical analysis of Phenomenon to conceive, control & optimize the performance of Electronics engineering systems used for different applications such as in navigation, automobiles, transportation, and automation.

e. Identify and critically evaluate the performance of a electronics engineering systems in terms of economics, safety, and social and physical environment and implement approaches to minimize any adverse impact leading to sustainable development of society.

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j Operate effectively and professionally within a team environment to solve complex problems of analyze, design and development of electronics systems.

k. Use all fundamental knowledge of electronics engineering, sciences and mathematics to plan, organize and use resources efficiently to reduce adverse effect on environments.

Course Outcomes:

1. Learner gains ability to apply knowledge of engineering in designing different case studies.

2. Students get ability to conduct experiments based on interfacing of devices to or interfacing to real world applications.

3. Students get ability to interface mechanical system to function in multidisciplinary system like in robotics, Automobiles.

4. Students can identify and formulate control and monitoring systems using microprocessors.

5. Students will design cost effective real time system to serve engineering solution for Global, social and economic context.

6. This course understanding will enforce students to acquire knowledge of recent trends like superscalar and pipelining and thus finds recognition of continuous updation.

7. Learn use of hardware and software tools. 8. Develop interfacing to real world devices

Mapping of Course outcomes and Program Outcomes

Course Outcome	Program Outcome
1	a, f, j
2	c, d, e
3	d, j
4	f, j, k
5	e, f, k
6	b, c
7	f, g

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P.E.S College of Engineering
Department of Mechanical Engineering

Department of Mechanical Engineering Program-Specific Outcomes (PSOs)

PSO1 Graduates of the program will achieve excellence in product design, thermal engineering and manufacturing system by acquiring knowledge in mathematics, science and designing principles.

PSO2 Graduate will analyze, interpret and provide solutions to the real life mechanical engineering problems.

PSO3 Graduate will develop an approach to solve multidisciplinary problems of manufacturing and allied industries.

PSO4 Graduates will learn managerial skills to work effectively in a team and in a society by following ethical and environmental practices.

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Mechanical Engineering Department

3	Subject	Strength of Materials (BT-MEC 403)	SE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓		✓	✓				✓	✓		✓			✓
CO2	✓	✓	✓		✓	✓				✓	✓		✓	✓		✓
CO3	✓	✓	✓		✓	✓				✓	✓		✓	✓	✓	✓
CO4	✓		✓		✓	✓				✓	✓		✓		✓	✓
CO5	✓		✓		✓	✓				✓	✓		✓			
CO6	✓				✓	✓				✓	✓		✓			

4	Subject	Numerical Methods in Mechanical Engineering (BT-MEC 404)	SE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓		✓	✓								✓			
CO2	✓	✓		✓	✓								✓			
CO3	✓	✓		✓	✓								✓			
CO4	✓	✓		✓	✓								✓			

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Mechanical Engineering Department

3	Subject	Machine Drawing and Computer Aided Drafting	SE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓								✓	✓		✓	✓			
CO2	✓	✓							✓	✓		✓	✓			✓
CO3	✓								✓	✓			✓			
CO4	✓	✓			✓				✓	✓		✓	✓	✓		
CO5	✓	✓			✓				✓	✓		✓	✓	✓	✓	✓
CO6	✓	✓			✓				✓	✓		✓	✓	✓		

4	Subject	Thermodynamics (BT-MEC 305)	SE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓											✓			✓
CO2	✓	✓	✓											✓		
CO3		✓	✓												✓	
CO4	✓				✓									✓		
CO5	✓	✓														✓

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Mechanical Engineering Department

Mapping of course outcomes (COs) with program outcomes (POs) & program-specific outcomes (PSOs)

1	Subject	Material Science and Metallurgy (BT-MEC 302)	SE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓										✓			
CO2	✓	✓	✓	✓	✓								✓	✓	✓	
CO3	✓	✓	✓	✓	✓								✓	✓		
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓		
CO5	✓	✓	✓	✓	✓		✓		✓					✓		✓
CO6	✓	✓	✓	✓	✓	✓	✓		✓	✓			1	✓		

2	Subject	Fluid Mechanics (BT- MEC 303)	SE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓	✓	✓							✓		✓		
CO2	✓	✓	✓	✓	✓							✓	✓			✓
CO3	✓	✓	✓	✓	✓							✓				
CO4	✓	✓										✓			✓	
CO5	✓	✓										✓				
CO6	✓	✓														

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Semester IV

1	Subject	Manufacturing Processes-I (BT-MEC 401)	SE SE (B-Tech) (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓		✓	✓				✓	✓		✓			✓
CO2	✓	✓	✓		✓	✓				✓	✓		✓	✓		✓
CO3	✓	✓	✓		✓	✓				✓	✓		✓	✓	✓	✓
CO4	✓		✓		✓	✓				✓	✓		✓		✓	✓
CO5	✓		✓		✓	✓				✓	✓		✓			
CO6	✓				✓	✓				✓	✓		✓			

2	Subject	Theory of Machines- I (BT-MEC 402)	SE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1				✓								✓	✓			
CO2				✓								✓	✓	✓		✓
CO3	✓	✓		✓								✓	✓	✓	✓	✓
CO4	✓	✓		✓								✓	✓		✓	✓
CO5	✓	✓		✓								✓	✓		✓	

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5	Subject	Basic Human Rights (BT-HMC 306)	SE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1						✓							✓			
CO2																
CO3									✓					✓	✓	✓
CO4								✓		✓						
CO5												✓				
CO6																

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7	Subject	Solar Energy BTMEC606B	TE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓														
CO2	✓	✓				✓							✓			
CO3	✓	✓		✓	✓		✓						✓	✓		
CO4	✓	✓											✓	✓		
CO5	✓	✓		✓	✓								✓			
CO6			✓			✓	✓									

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5	Subject	Mechanical Measurements BTMEC604D	TE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1		✓	✓	✓	✓							✓	✓	✓		
CO2	✓	✓	✓	✓	✓							✓	✓	✓	✓	
CO3	✓	✓	✓	✓	✓							✓	✓	✓	✓	

6	Subject	Renewable Energy Sources BTMEC605C	TE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓			
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	
CO3	✓	✓	✓				✓	✓		✓		✓	✓	✓	✓	
CO4	✓	✓			✓	✓	✓	✓				✓		✓		

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3	Subject	Applied Thermodynamics – II BTMEC603	TE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓						✓				✓	✓	✓		
CO2	✓	✓		✓		✓		✓		✓		✓	✓	✓		✓
CO3	✓	✓				✓		✓		✓		✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓		✓		✓		✓		✓	✓	✓	✓	✓
CO5	✓	✓				✓		✓		✓		✓	✓		✓	✓
CO6	✓	✓	✓	✓		✓		✓		✓		✓	✓		✓	

4	Subject	IC Engines BTMEC604B	TE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓			✓				✓				✓			
CO2	✓	✓			✓								✓			
CO3	✓	✓			✓		✓		✓					✓		
CO4	✓	✓		✓	✓				✓				✓	✓		
CO5	✓	✓	✓		✓		✓									
CO6	✓	✓		✓	✓		✓		✓							

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Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓	✓			✓					✓	✓			
CO2	✓	✓										✓	✓		✓	
CO3	✓	✓	✓	✓	✓							✓	✓	✓	✓	
CO4	✓	✓	✓	✓								✓	✓			
CO5	✓	✓	✓		✓							✓	✓	✓		
CO6	✓	✓	✓	✓				✓				✓				

2	Subject	Machine Design - II BTME602	TE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓						✓				✓	✓		✓	
CO2	✓	✓				✓		✓		✓		✓	✓		✓	
CO3	✓	✓		✓		✓		✓		✓		✓	✓		✓	
CO4	✓	✓	✓			✓		✓		✓		✓	✓	✓	✓	
CO5	✓	✓		✓		✓		✓		✓		✓	✓	✓		
CO6	✓	✓	✓			✓		✓		✓		✓	✓			

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5	Subject	Metrology and Quality Control BTMEC505	TE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1				✓									✓			
CO2		✓	✓		✓								✓	✓		
CO3			✓	✓	✓								✓	✓	✓	
CO4						✓							✓	✓	✓	
CO5	✓					✓		✓	✓		✓	✓	✓		✓	
CO6	✓					✓		✓	✓		✓	✓	✓			

6	Subject	Product Design Engineering – II BTID506	TE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓											✓			
CO2	✓	✓					✓	✓					✓	✓	✓	
CO3	✓	✓		✓	✓								✓	✓	✓	
CO4	✓	✓											✓	✓		

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1	Subject	Manufacturing Processes - II (BTMEC601)	TE (B-Tech)

3	Subject	Machine Design - I BTMEC503	TE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓						✓				✓	✓	✓		
CO2	✓	✓		✓		✓		✓		✓		✓	✓	✓		✓
CO3	✓	✓				✓		✓		✓		✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓		✓		✓		✓		✓	✓	✓	✓	✓
CO5	✓	✓				✓		✓		✓		✓	✓		✓	✓
CO6	✓	✓	✓	✓		✓		✓		✓		✓	✓		✓	

4	Subject	Theory of Machines - II BTMEC504	TE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓		✓		✓			✓		✓	✓			
CO2	✓	✓					✓					✓	✓		✓	
CO3	✓	✓										✓	✓	✓	✓	
CO4	✓	✓		✓								✓	✓	✓		
CO5	✓	✓		✓								✓	✓			
CO6	✓	✓		✓								✓	✓			

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THIRD YEAR

1	Subject	Heat Transfer (BTMEC501)	TE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓			✓				✓				✓			
CO2	✓	✓			✓								✓			
CO3	✓	✓			✓		✓		✓					✓		
CO4	✓	✓		✓	✓				✓				✓	✓		
CO5	✓	✓	✓		✓		✓									
CO6	✓	✓		✓	✓		✓		✓							

2	Subject	Applied Thermodynamics - I (BTMEC502)	TE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓														
CO2	✓	✓														
CO3	✓												✓	✓		
CO4			✓		✓								✓			
CO5		✓											✓			

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5	Subject	Product Design Engineering (BT-MEC 405)	SE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓											✓			✓
CO2	✓	✓											✓			✓
CO3	✓	✓			✓								✓	✓	✓	
CO4	✓	✓		✓	✓								✓	✓	✓	
CO5	✓	✓		✓	✓								✓			
CO6	✓	✓											✓			

6	Subject	Interpersonal Skills (BT-MEC 406 C)	SE (B Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1								✓								
CO2										✓						
CO3												✓				
CO4									✓							
CO5										✓						
CO6											✓					

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9	Subject	Project Stage – I BTMEP711	BE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓											✓	✓	✓	✓
CO2										✓			✓	✓	✓	✓
CO3		✓					✓		✓		✓	✓	✓		✓	
CO4			✓	✓	✓	✓				✓		✓	✓		✓	
CO5			✓					✓	✓		✓		✓	✓		✓
CO6	✓									✓			✓	✓		✓

10	Subject	Project Stage – II/Internship and Project BTMEP803	BE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓											✓	✓		✓
CO2			✓	✓	✓	✓	✓						✓	✓	✓	✓
CO3		✓			✓	✓		✓		✓			✓	✓	✓	✓
CO4			✓	✓	✓	✓	✓			✓		✓	✓	✓	✓	✓

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7	Subject	Wind Energy BTMEC705C	BE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1							✓	✓	✓	✓		✓				
CO2		✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		
CO3	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓		
CO4	✓	✓		✓								✓	✓			
CO5	✓	✓	✓									✓				

8	Subject	Field Training/Internship/Industrial Training – III BTMEI710	BE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1		✓	✓			✓		✓			✓	✓	✓	✓	✓	✓
CO2		✓	✓			✓		✓			✓	✓	✓	✓	✓	✓

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3	Subject	Manufacturing Processes – III BTMEC703	BE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓										✓			
CO2	✓	✓			✓								✓		✓	
CO3	✓	✓	✓									✓	✓	✓	✓	
CO4	✓	✓	✓			✓	✓						✓	✓		
CO5	✓	✓	✓			✓	✓							✓		
CO6	✓	✓	✓			✓								✓		

4	Subject	Industrial Engineering and Management BTMEC704B	BE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1											✓	✓				
CO2									✓	✓	✓		✓	✓		
CO3								✓				✓	✓	✓	✓	
CO4								✓					✓			

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BE MECHANICAL FINAL YEAR

1	Subject	Mechatronics BTMEC701	BE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓	✓	✓				✓			✓	✓			
CO2	✓	✓			✓	✓	✓			✓	✓	✓	✓	✓		
CO3	✓	✓		✓	✓	✓	✓				✓	✓	✓	✓		
CO4	✓	✓	✓	✓	✓		✓	✓	✓				✓	✓	✓	
CO5	✓			✓	✓	✓	✓					✓	✓		✓	
CO6		✓	✓		✓	✓	✓	✓	✓			✓	✓			

2	Subject	CAD/CAM BTMEC702	BE (B-Tech)

Course Outcomes	Program Outcomes												Program specific outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	✓											✓				
CO2	✓	✓	✓		✓							✓	✓		✓	
CO3	✓		✓									✓	✓		✓	
CO4	✓	✓			✓							✓	✓	✓	✓	
CO5	✓	✓	✓	✓	✓							✓	✓	✓		
CO6	✓		✓									✓		✓		

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Key Indicator- 2.6 Student Performance and Learning Outcome

2.6.2 Attainment of Program outcomes and course outcomes are evaluated by the institution

The program outcomes and Program Specific outcomes are assessed with the help of course outcomes of the relevant courses through direct and indirect methods. Direct methods are provided through direct examinations or observations of student knowledge or skills against measurable course outcomes. The knowledge and skills described by the course outcomes are mapped to specific problems on University Examination, internal exams and assignment. Finally, program outcomes are assessed and Program Assessment Committee concludes the PO attainment level. To evaluate skill of Students college student are participated in various competition At the end of each semester, university conducts examinations based on the result published by the university the course outcomes are measured. Department endorse students to choose their project related to the University subject to utilized theoretical skills in industry. The assignments are provided to students and they refer the text books and good reference books to find out the answers and understand the expected outcome of the given problem. Three internal tests are conducted per semester for the following purposes

- To ensure that students have achieved desired level of competencies at module level.
- To evaluate, whether corresponding COs are achieved or not.
- According to the performance of the student in answering each question, mapping is carried out with the respective COs for assessing the attainment level of the specific CO of the subject.

POs, PSOs and COs are displayed and propagated to all the stakeholders (Industry, alumni, Parents, faculty and graduating students are notified about the outcomes clearly. COs of the programs is given to each and every department so the students and teachers can perceive and work with determination so the soft copies of the curriculum and course outcomes are also uploaded on the website of the Institution for reference. Hard copy of Course packs are given to all students and teachers for ready reference.

For each course outcome, methods of measurement are identified to measure progress of the outcome. Assessment of learning outcomes is carried out using data collected includes the following:

- Assessment of theory courses, through internal examinations and semester end examinations
- Assessment of laboratory course
- Assessment of Project work

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Examination Process:

1.Continuous Internal Examinations (CIE) In a semester, the subject teacher will conduct one mid-term and two subjective continuous assessment tests as per the academic calendarr.

1.**Semester End Examinations** (SEE) semester end exam is conducted by the university.

1.**Theory Course:** The examination will be conducted at the end of each semester.

2.**Laboratory Course**: The practical examination will be conducted at the end of each semester in the presence of external examiner.

3.**Project Work Evaluation (Mini project / Main Project):** For project work, the evaluation process consists continuous internal evaluation carried out by the supervisor and final viva-voce in the presence of the external examiner. For mini project and internship evaluation process consists of two examiners for continuous internal evaluation And the final pratical /oral viva conducted by supervisor and external examiner appointed by the university.

Assessment Process: The assessment process used to evaluate course outcome consists of 60% end semester exam assessment and 40% internal assessment.

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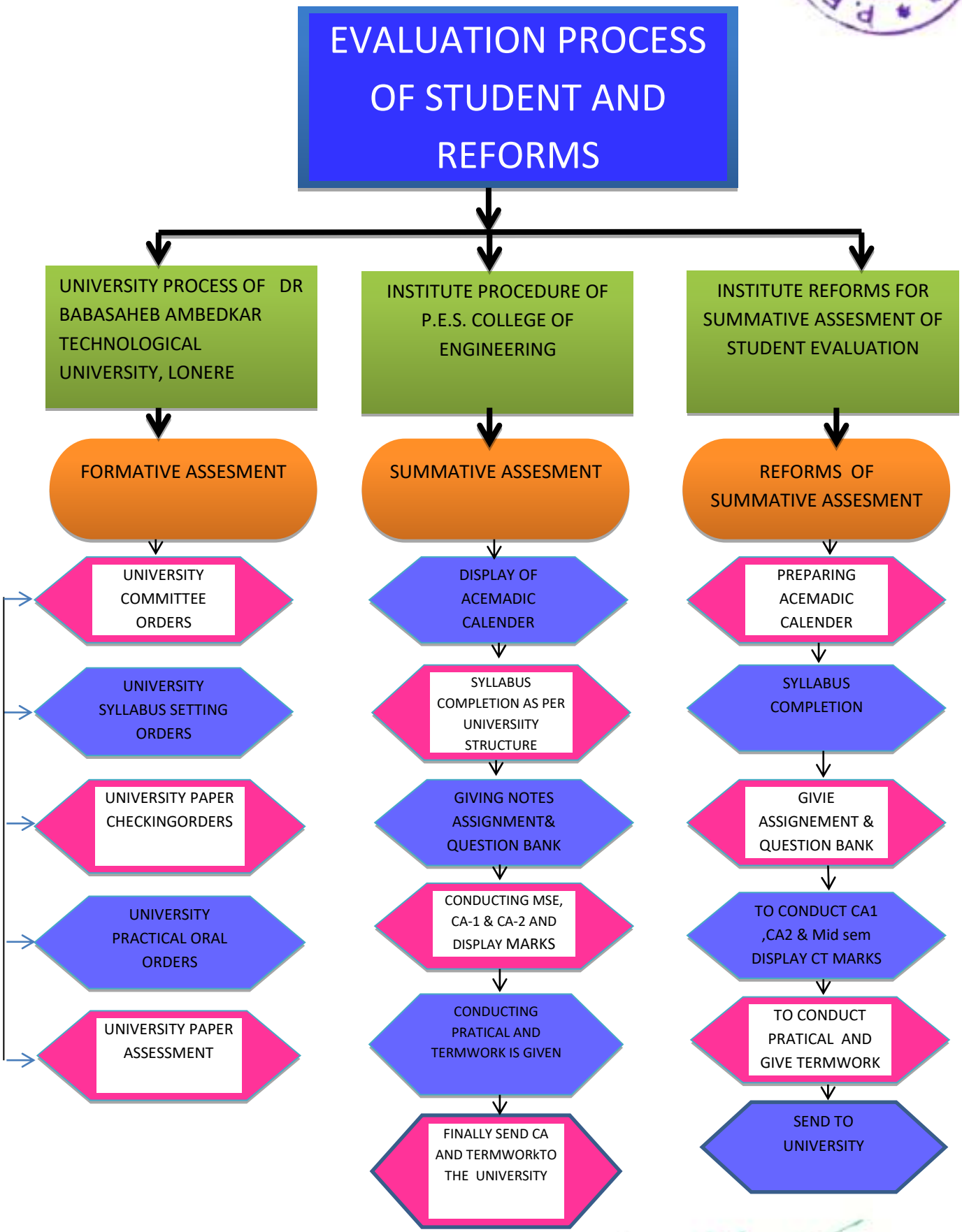
2.5.1 Evaluation Processes and Reforms



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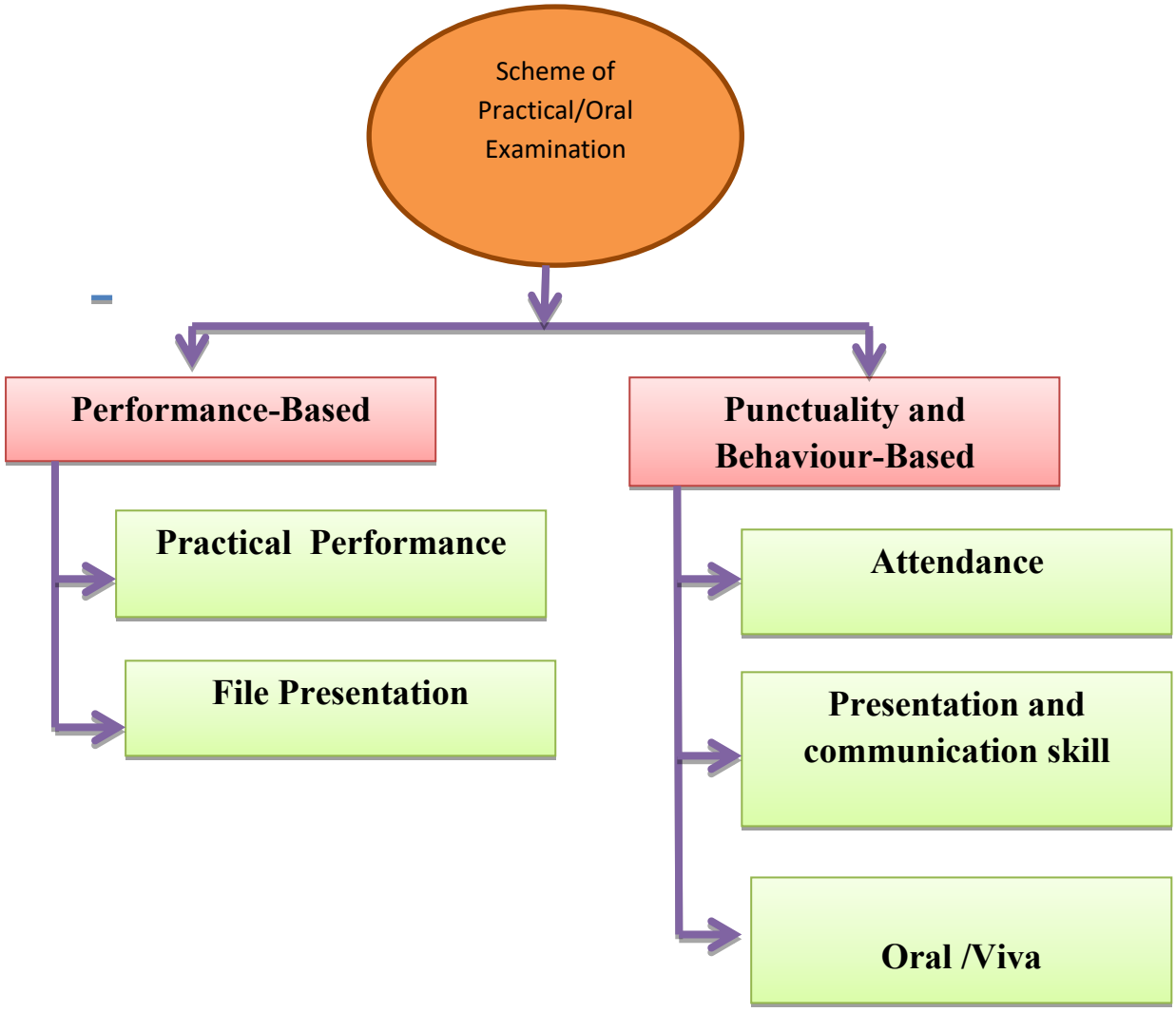

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Nagsenvan, Aurangabad

Department of Mechanical Engineering

Result Analysis for Acadmic Year 2020-2021

Sr.No.	Class	Division	No. of Stundent appered	No. of Stundent Pass	Passing %
1	SE	A+B	92	92	100%
2	TE	A+B	121	121	100%
3	BE	A+B	103	103	100%

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Department of Mechanical Engineeri

PES College of Engineering, Auragabad
Department of Computer Science & Engineering
Result Analysis 2020-21

Class	No. of Students	Passed Students	Passing %
SY CSE	116	110	94.00%
TY CSE	107	105	98.00%
Btech CSE	80	80	100.00%

HOD
CSE Dept

P. E. S. College of Engineering, Aurangabad

Dept. of Electrical Engineering

Result Analysis of 2020-2021

Division (A + B)

Sr. No.	Class	Total no of Appear	Total no of Pass	Percentage
1	S.Y	111	111	100 %
2	T.Y	118	118	100 %
3	B.E	110	110	100 %

Head

Dept. of Electrical Engineering

Dr. Chaudhari B.N.
Professor & Head
Department of Electrical Engineer
P.E.S. College of Engineering
Aurangabad (M.S.)

PES College of Engineering, Nagsenvana, Aurangabad

Department of Civil Engineering

Result Analysis for the Year 2020 – 21

CLASS	No. of Students	No. of Pass Students	Passing %
SE	78	75	96.15 %
TE	81	79	97.53 %
BE	52	51	98.79 %

Dr.
H.O.D
P.E.S. H.O.D Civil

P.E.S.COLLEGE OF ENGINEERING AURANGABAD

Department of Electronics & Telecommunication

RESULT ANALYSIS

ACADEMIC YEAR - 2020-2021

CLASS	No. of students appeared	No. of pass students	Passing percentage
SY BTech	19	19	100%
TY BTech	7	7	100%
Final year BTech	10	10	100%

HOD

ETC Department

P.E.S. College of Engineering

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Department of Mechanical Engineering

Subject wise Course Outcome 2021-22

Course	Course Outcome
SY MECH PART 1 BTMEC302 Materials Science and Metallurgy	1. Study various crystal structures of materials 2. Understand mechanical properties of materials and calculations of same using appropriate equations 3. Evaluate phase diagrams of various materials 4. Suggest appropriate heat treatment process for a given application Prepare samples of different materials for metagraphy Recommend appropriate NDT technique for a given application
SY MECH PART 1 BTMEC303 Fluid Mechanics	1. Define fluid, define and calculate various properties of fluid 2. Calculate hydrostatic forces on the plane and curved surfaces and explain stability of floating bodies 3. Explain various types of flow. Calculate acceleration of fluid particles 4. Apply Bernoulli's equation and Navier-Stokes equation to simple problems in fluid mechanics 5. Explain laminar and turbulent flows on flat plates and through pipes 5. Explain and use dimensional analysis to simple problems in fluid mechanics 7. Understand boundary layer, drag and lift
SY MECH PART 1 BTMEC304 Machine Drawing and Computer Aided Drafting	1. Interpret the object with the help of given sectional and orthographic views. 2. Construct the curve of intersection of two solids 3. Draw machine element using keys, cotter, knuckle, bolted and welded joint 4. Assemble details of any given part. i. e. valve, pump , machine tool part etc. 5. Represent tolerances and level of surface finish on production drawings 5. Understand various creating and editing commands in Auto Cad
SY MECH PART 1 BTMEC305 Thermodynamics	1. Define the terms like system, boundary, properties, equilibrium, work, heat, ideal gas, entropy etc. used in thermodynamics. 2.Study different laws of thermodynamics and apply these to simple thermal systems like balloon, piston-cylinder arrangement, compressor, pump, refrigerator, heat exchanger, etc. to study energy balance. 3. Study various types of processes like isothermal, adiabatic, etc. considering system with ideal gas and represent them on p-v and T-s planes. 4. Apply availability concept to non-flow and steady flow type systems. 5. Represent phase diagram of pure substance (steam) on different thermodynamic planes like p-v, T-s, h-s, etc. Show various constant property lines on them.
SY MECH PART 1 BTHM3401 Basic Human Rights	1. Understand the history of human rights. 2. Learn to respect others caste, religion, region and culture. 3. Be aware of their rights as Indian citizen. 4. Understand the importance of groups and communities in the society.

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Department of Mechanical Engineering

Subject wise Course Outcome 2021-22

	5. Realize the philosophical and cultural basis and historical perspectives of human rights. 5. Make them aware of their responsibilities towards the nation.
SY MECH PART 2 BTMEC401 Manufacturing Processes-I	1. Identify castings processes, working principles and applications and list various defects in metal casting 2. Understand the various metal forming processes, working principles and applications 3. Classify the basic joining processes and demonstrate principles of welding, brazing and soldering. 4. Study center lathe and its operations including plain, taper turning, work holding devices and cutting tool. 5. Understand milling machines and operations, cutters and indexing for gear cutting. 5. Study shaping, planing and drilling, their types and related tooling
SY MECH PART 2 BTMEC402 Theory of Machines- I	1. Define basic terminology of kinematics of mechanisms 2. Classify planar mechanisms and calculate its degree of freedom 3. Perform kinematic analysis of a given mechanism using ICR and RV methods 4. Perform kinematic analysis of a given mechanism analytically using vector or complex algebra method 5. Perform kinematic analysis of slider crank mechanism using Klein's construction and analytical approach
SY MECH PART 2 BTMEC403 Strength of Materials	1 State the basic definitions of fundamental terms such as axial load, eccentric load, stress, strain, E, μ, etc. 2 Recognize the stress state (tension, compression, bending, shear, etc. and calculate the value of stress developed in the component in axial/eccentric static and impact load cases. 3. Distinguish between uniaxial and multiaxial stress situation and calculate principal stresses, max. shear stress, their planes and max. normal and shear stresses on a given plane. 4. Analyze given beam for calculations of SF and BM 5. Calculate slope and deflection at a point on cantilever /simply supported beam using double integration, Macaulay's , Area-moment and superposition methods 5. Differentiate between beam and column and calculate critical load for a column using Euler's and Rankine's formulae
SY MECH PART 2 BTID405 Product Design Engineering - I	1. Create simple mechanical designs 2. Create design documents for knowledge sharing 3. Manage own work to meet design requirements 4. Work effectively with colleagues
TY MECH PART 1 BTMEC501 Heat Transfer	1. Explain the laws of heat transfer and deduce the general heat conduction equation and to explain it for 1-D steady state heat transfer in regular shape bodies 2. Describe the critical radius of insulation, overall heat transfer coefficient, thermal conductivity and lumped heat transfer 3. Interpret the extended surfaces

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Department of Mechanical Engineering

Subject wise Course Outcome 2021-22

	4. Illustrate the boundary layer concept, dimensional analysis, forced and free convection under different conditions 5. Describe the Boiling heat transfer, mass transfer and Evaluate the heat exchanger and examine the LMTD and NTU methods applied to engineering problems 5. Explain the thermal radiation black body, emissivity and reflectivity and evaluation of view factor and radiation shields
TY MECH PART 1 BTMEC502 Applied Thermodynamics - I	1.Define the terms like calorific value of fuel, stoichiometric air-fuel ratio, excess air, equivalent evaporation, boiler efficiency, etc. Calculate minimum air required for combustion of fuel. 2. Study and Analyze gas power cycles and vapour power cycles like Otto, Diesel, dual, Joule and Rankine cycles and derive expressions for the performance parameters like thermal efficiency, P m Classify various types of boiler, nozzle, steam turbine and condenser used in steam power plant. 4. Classify various types of IC engines. Sketch the cut section of typical diesel engine and label its components. Define the terms like TDC, BDC, r c , etc. 5. Draw P-v diagram for single-stage reciprocating air compressor, with and without clearance volume, and evaluate its performance. Differentiate between reciprocating and rotary air compressors.
TY MECH PART 1 BTMEC503 Machine Design - I	1. Formulate the problem by identifying customer need and convert into design specification 2. Understand component behavior subjected to loads and identify failure criteria. 3. Analyze the stresses and strain induced in the component 4. Design of machine component using theories of failures 5. Design of component for finite life and infinite life when subjected to fluctuating load 5. Design of components like shaft, key, coupling, screw and spring
TY MECH PART 1 BTMEC504 Theory of Machines - II	1. Identify and select type of belt and rope drive for a particular application 2. Evaluate gear tooth geometry and select appropriate gears, gear trains 3. Define governor and select/suggest an appropriate governor 4. Characterize flywheels as per engine requirement 5. Understand gyroscopic effects in ships, aeroplanes, and road vehicles. 5. Understand free and forced vibrations of single degree freedom systems
TY MECH PART 1 BTMEC505 Metrology and Quality Control	1. Identify techniques to minimize the errors in measurement 2. Identify methods and devices for measurement of length, angle, and gear and thread parameters, surface roughness and geometric features of parts. 3. Choose limits for plug and ring gauges. 4. Explain methods of measurement in modern machineries 5. Select quality control techniques and its applications 5. Plot quality control charts and suggest measures to improve the quality of product and reduce cost using Statistical tools.

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Subject wise Course Outcome 2021-22

TY MECH PART 1 BTMEC505 Metrology and Quality Control	1. Understand the process of powder metallurgy and its applications 2. Calculate the cutting forces in orthogonal and oblique cutting 3. Evaluate the machinability of materials 4. Understand the abrasive processes 5. Explain the different precision machining processes 5. Design jigs and fixtures for given application
TY MECH PART 2 BTMEC601 Manufacturing Processes - II	1. Understand the process of powder metallurgy and its applications 2. Calculate the cutting forces in orthogonal and oblique cutting 3. Evaluate the machinability of materials 4. Understand the abrasive processes 5. Explain the different precision machining processes 5. Design jigs and fixtures for given application
TY MECH PART 2 BTMEC602 Machine Design - II	1. Define function of bearing and classify bearings. 2. Understanding failure of bearing and their influence on its selection. 3. Classify the friction clutches and brakes and decide the torque capacity and friction disk parameter. 4. Select materials and configuration for machine element like gears, belts and chain 5. Design of elements like gears, belts and chain for given power rating 5. Design thickness of pressure vessel using thick and thin criteria
TY MECH PART 2 BTMEC603 Applied Thermodynamics – II	1. Apply first law of thermodynamics for closed systems and flow process. Produce TDS relations from Maxwell's relations. 2. Calculate thermal efficiencies of heat engine. 3. Calculate work done and heat transfer for flow and non-flow process. 4. Calculate properties of air vapor mixture using mathematical knowledge and psychrometric chart.
TY MECH PART 2 BTMEC604B IC Engines	1. Explain fuel injection systems in SI engine, types of combustion chamber and combustion process. 2. Explain different types of fuel injection system and combustion chambers of CI engine. 3. Explain the mechanism of pollution formation and the evolution of emission norms. 4. Describe the properties of various alternative fuels, engine modification required and emission characteristic of alternative fuels 5. Discuss various ignition methods used in I.C engine and electronic engine management system.
B.Tech Part 1 BTMEC701 Mechatronics	1.Define sensor, transducer and understand the applications of different sensors and transducers 2. Explain the signal conditioning and data representation techniques 3. Design pneumatic and hydraulic circuits for a given application 4. Write a PLC program using Ladder logic for a given application 5. Understand applications of microprocessor and micro controller 5. Analyse PI, PD and PID controllers for a given application
B.Tech Part 1 BTMEC702 CAD/CAM	1. List and describe the various input and output devices for a CAD work station 2.Carry out/calculate the 2-D and 3-D transformation positions (Solve problems on 2- D and 3-D transformations) 3. Describe various CAD modelling techniques with their relative

	advantages and limitations 4. Describe various CAD modelling techniques with their relative advantages and limitations 5. Develop NC part program for the given component, and robotic tasks 5. Describe the basic Finite Element procedure 7. Explain various components of a typical FMS system, Robotics, and CIM CO8 Classify parts in part families for GT CO9 Describe and differentiate the CAPP systems
B.Tech Part 1 BTMEC703 Manufacturing Processes - III	1. Differentiate clearly between NC and CNC machines 2. Prepare and execute a part program for producing a given product 3. Select appropriate non-traditional machining process for a given application 4. Compare different surface coating techniques 5. Explain different rapid prototyping techniques 5. Illustrate the working principle of various micro-manufacturing processes
B.Tech Part 1 Industrial Engineering and Management	1.Impart fundamental knowledge and skill sets required in the Industrial Management and Engineering profession, which include the ability to apply basic knowledge of mathematics, probability and statistics, and the domain knowledge of Industrial Management and Engineering 2. Produce ability to adopt a system approach to design, develop, implement and innovate integrated systems that include people, materials, information, equipment and energy. 3. Understand the interactions between engineering, businesses, technological and environmental spheres in the modern society. 4. Understand their role as engineers and their impact to society at the national and global context.
B.Tech Part 1 BTMEC705C Wind Energy	1. Understand historical applications of wind energy 2. Understand and explain wind measurements and wind data 3. Determine Wind Turbine Power, Energy and Torque 4. Understand and explain Wind Turbine Connected to the Electrical Network AC and DC 5. Understand economics of wind energy
B.Tech Part 1 BTMEF710 Field Training /Internship/Industrial Training III	1.To make the students aware of industrial culture and organizational setup 2. To create awareness about technical report writing among the student
B.Tech Part 2 BTMEC801A Fundamentals of Automotive Systems	1.Acquire fundamental knowledge of the various systems of an automobile, 2. Associate the functions of each system with its design and layout, depict the various systems using simple schematics, and apply concepts learnt in core undergraduate courses to synthesize mathematical models of

	the various systems.
B.Tech Part 2 BTMEC801F Non-Conventional Energy Resources	1. Demonstrate the generation of electricity from various Non-Conventional sources of energy, have a working knowledge on types of fuel cells. 2. Estimate the solar energy, Utilization of it, Principles involved in solar energy collection and conversion of it to electricity generation. 3. Explore the concepts involved in wind energy conversion system by studying its components, types and performance. 4. Illustrate ocean energy and explain the operational methods of their utilization. 5. Acquire the knowledge on Geothermal energy.
B.Tech Part 2 BTMEP803 Project Stage-II or Internship and Project*	1.State the aim and objectives for this stage of the project 2. Construct and conduct the tests on the system/product 3. Analyze the results of the tests. 4. Discuss the findings, draw conclusions, and modify the system/product, if necessary

P.E.S College of Engineering
Department of Mechanical Engineering

2021-22

Program Outcomes

1.Apply the knowledge of mathematics, basic sciences, and mechanical engineering to the solution of complex engineering problems.

2. Identify, formulate, research literature, and analyze complex mechanical engineering problems reaching substantiated conclusions.

3. Design solutions for complex engineering problems and design mechanical system components that meet the specified needs.

4. Use mechanical engineering research-based knowledge related to interpretation of data and provide valid conclusions.

5. Create, select, and apply modern mechanical engineering and IT tools to complex engineering activities with an understanding of the limitations.

6. Apply reasoning acquired by the mechanical engineering knowledge to assess societal and safety issues.

7. Understand the impact of engineering solutions on the environment, and demonstrate the knowledge for sustainable development.

8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communicate effectively on complex engineering activities with the engineering community and with society at large.

11. Understand the engineering and management principles and apply these to the multidisciplinary environments.

12. Recognize the need for life-long learning in the broadest context of technological change.

Dr. Babasaheb Ambedkar Technological University, Lonere- 402103

P.E.S.College of Engineering, Aurangabad

Department of Electronics and Computer Engineering

Course Coordinator : Prof. P.K.Ghuge

Course Name : Digital System Design

Course Code : BTETOE605A

Academic Year : 2021-2022

Semester I / II : II

	Program Educational Objectives(PEO) and Program Specific Outcomes (PSO)	Year : 20 - 20 Semester : I / II

Program Educational Objectives (PEO)

1.	To equip graduates with a strong foundation in engineering sciences and Electronics & Telecommunication Engineering fundamentals to become effective collaborators, researchers and real-time problem solvers with technical competencies.
2.	Perceive the limitation and impact of engineering solutions in social, legal, environmental, economical and multidisciplinary contexts.
3.	Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting global competitiveness.

Program Specific Outcomes (PSO)

1.	Specify, design, build and test analog, digital for signal processing.
2.	Ability to design and implement the acquired technical knowledge with proficiency in logical programming for applications in electronics engineering.
3.	Apprehend and analyze specific engineering problems by applying the knowledge of basic sciences, engineering mathematics and engineering fundamentals.
4.	Ability to communicate effectively with excellent interpersonal skills and demonstrate the practice of professional ethics for societal benefit.

	Program Outcomes (PO)	Year : 20 - 20 Semester : I / II

PROGRAM OUTCOMES: Upon successful completion of this course it is expected that electronics graduate will be able to:

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3.	**Design/ Development of Solutions:**Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** :use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO5.	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an under- standing of the limitations.
PO6.	**The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7.	**Environment and Sustainability:** Understand the impact of professional engineering solutions in soci- etal and environmental contexts and demonstrate knowledge of and need for sustainable develop-ment.
PO8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO9.	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.
PO10.	**Communication:** Communicate effectively on complex engineering activities with the engineering com-munity and with society at large, such as being able to comprehend and write

	effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO11.	**Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12.	**Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change

	Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Course Objective : As part of this course, Students	
1.	The concept and theory of digital Electronics are needed in almost all electronics and telecommunication engineering fields and in many other engineering and scientific disciplines as well.
2.	The main objective of this course is to lay the foundation for further studies in areas such as communication, VLSI, computer, microprocessor etc. One of the most important reasons for the unprecedented growth of digital electronics is the advent of integrated circuits.
3.	This course will explore the basic concepts of digital electronics.

Course Outcomes : At the end of course, the student will be able to	
CO1	Design and analyze combinational logic circuits
CO2	Design & analyze modular combinational circuits with MUX/DEMUX, Decoder, Encoder
CO3	Design & analyze synchronous sequential logic circuits
CO4	Use HDL & appropriate EDA tools for digital logic design and simulation.

	Mapping of Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Mapping of Course Outcomes (COs) with Program Outcomes (POs):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓			✓		✓		✓	✓			
CO2		✓			✓					✓		
CO3				✓			✓				✓	
CO4			✓			✓						✓

Mapping of Course Outcomes (COs) with Program Specific Outcomes (PSO)

	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓		
CO2		✓			✓
CO3	✓		✓		✓
CO4		✓		✓	

	Teaching Plan	Year : 20 - 20 Semester : I / II

Bloom Levels: 1. Remember 2.Understand 3. Apply 4.Analysis 5. Create

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1		Introduction to Digital Electronics ,Logic Gates	**1,2,3**	N.G.Palan
2		Implementation of Logic Gates	**1,2,3**	N.G.Palan
3		Implementation of Universal Logic Gates	**1,2,3**	N.G.Palan
4		Standard representations for logic functions	**1,2,3**	N.G.Palan
5		Boolean algebra and Dep Morgan‟s Theorem,	**1,2,3**	N.G.Palan
6		Problem solving on Boolean Algebra	**3,4**	N.G.Palan
7		k map representation of logic functions SOP	**2,3**	N.G.Palan,S.P.Bali
8		k map representation of logic functions POS	**2,3**	N.G.Palan,S.P.Bali
9		minimization of logical functions for min-terms and max-terms	**2,3,4**	N.G.Palan,S.P.Bali
10		Problem Solving	**2,3,4**	N.G.Palan,S.P.Bali
11		don’t care conditions,	**2,3,4**	N.G.Palan,S.P.Bali
12		5,6 variables k-map problem solving	**2,3,4**	N.G.Palan,S.P.Bali
13		Code converters - G to B,B to G	**2,3**	B.M.Bakwad
14		Code converters - B to EX-3,EX3 to B	**2,3**	B.M.Bakwad
15		Digital Comparator	**2,3**	B.M.Bakwad
16		Multiplexer and Multiplexer Tree	**3,4,5**	B.M.Bakwad
17		Design of Multiplexers	**3,4,5**	B.M.Bakwad
18		Demultiplexers, Decoders.	**3,4,5**	B.M.Bakwad
19		Arithmetic Circuits - HA,HS,FA,FS	**2,3,4**	B.M.Bakwad
20		Adders and their use as subtractor	**2,3**	B.M.Bakwad
21		BCD Adder, Barrel shifter and ALU	**2,3**	B.M.Bakwad

22		1 Bit Memory Cell, Building blocks like S-R	**2**	N.G.Palan,A.P.Godse
23		JK and Master-Slave JK FF, Edge triggered FF,D and T flip-flops	**2**	N.G.Palan,A.P.Godse
24		Conversion of flip flops	**2,3**	N.G.Palan,A.P.Godse
25		Registers, Shift registers,	**3,4,5**	N.G.Palan,A.P.Godse
26		Asynchronous counters	**3,4,5**	N.G.Palan,A.P.Godse
27		Design Problems on Asynchronous counters	**3,4,5**	N.G.Palan,A.P.Godse
28		synchronous counters	**3,4,5**	N.G.Palan,A.P.Godse
29		Design Problems on synchronous counters	**3,4,5**	N.G.Palan,A.P.Godse
30		up/down counters- Asynchronous ,Synchronous	**3,4,5**	N.G.Palan,A.P.Godse
31		Finite state machines, Design of synchronous FSM	**3,4,5**	A.P.Gods
32		Algorithmic State Machines charts.	**3,4,5**	A.P.Gods
33		Designing synchronous circuits like Pulse train generator	**3,4,5**	A.P.Gods
34		Pseudo Random Binary Sequence generator, Clock generation	**3,4,5**	A.P.Gods
35		TTL NAND gate, Specifications	**2,3**	A.P.Gods
36		Noise margin, Propagation delay, fan-in, fan-out	**1,2,3**	A.P.Gods
37		Tri State TTL, ECL, CMOS families and their interfacing	**1,2,3**	A.P.Gods
38		Concept of Programmable logic devices like FPGA	**1,2**	A.P.Gods
39		Logic implementation using Programmable Devices	**2,3,4**	A.P.Gods
40		Design entry: Schematic, FSM & HDL	**1,2,3**	A.P.Gods
41		different modeling styles in VHDL,Behavioral and Structural Modeling,	**1,2,3**	Pedroni V.A
42		Data types and objects, Dataflow,	**1,2,3**	Pedroni V.A
43		Synthesis and Simulation VHDL constructs and codes for combinational and sequential circuits.	**3,4,5**	Pedroni V.A

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P.E.S.College of Engineering, Aurangabad

Department of Electronics and Computer Engineering

Course Coordinator: Dr. M. R. Rajput

Course Name : Python Programming

Course Code : BTETPE405E

Academic Year :2021-22

Semester II

	Program Educational Objectives(PEO) and Program Specific Outcomes (PSO)	Year : 2021 - 2022 Semester II

Program Educational Objectives (PEO)

1.	Graduates will be able to succeed in positions in engineering practice or research, and in other fields they choose to pursue.
2.	Graduates will become a responsible member of society
3.	Graduates will be leaders, both in their chosen profession and in other activities
4.	Graduates will address the complexities of real life engineering problems and be able to formulate solutions that are technically sound, economically feasible and sustainable.

Program Specific Outcomes (PSO)

1.	Apply basic knowledge related to Electronic Circuits, Embedded & wireless communication Systems and Signal Processing to solve engineering/ societal problems in the field of Electronics and Telecommunication Engineering.
2.	Recognize and adapt to technical developments and to engage in lifelong learning and develop consciousness for professional, social, legal and ethical responsibilities
3.	Excellent adaptability to the changing industrial and real world requirements.

	Program Outcomes (PO)	Year : 2021 - 2022 Semester : II

PROGRAM OUTCOMES: Upon successful completion of this course it is expected that electronics graduate will be able to:

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3.	**Design/ Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** : use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO5.	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an under- standing of the limitations.
PO6.	**The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7.	**Environment and Sustainability:** Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.
PO8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO9.	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10.	**Communication:** Communicate effectively on complex engineering activities with the engineering com-munity and with society at large, such as being able to comprehend and write

	effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO11.	**Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12.	**Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change

	Course Objective and Course Outcomes	Year : 2021 - 2022 Semester : II

Course Objective :	
1.	To provide an understanding of the role computation can play in solving problems.
2.	To help students, including those who do not plan to major in Computer Science and Electrical Engineering, feel confident of their ability to write small programs that allow them to accomplish useful goals.
3.	To position students so that they can compete for research projects and excel in subjects with programming components

Course Outcomes : At the end of course, the student will be able to	
CO 1	Experience with an interpreted Language.
CO 2	To build software for real needs
CO 3	Prior Introduction to testing software

	Mapping of Course Objective and Course Outcomes	Year : 2021 - 2022 Semester : II

Mapping of Course Outcomes (COs) with Program Outcomes (POs):

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12
CO 1		✔	✔	✔								
CO 2						✔				✔		
CO 3					✔							

Mapping of Course Outcomes (COs) with Program Specific Outcomes (PSO)

	PO1	PO2	PO3	PO4
CO1	✔	✔	✔	
CO2		✔	✔	✔
CO3			✔	✔

	Teaching Plan	Year : 20 - 20 Semester : I / II

Bloom Levels: 1. Remember 2.Understand 3. Apply 4.Analysis 5. Create

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. _____ to _____
1	29/03/22	Unit 1 **Introduction:** History of Python, Need of Python Programming, features of python	remember	Core Python Programming, Dr. R. Nagsenvana Rao
2	30/03/22	comparison between C, JAVA and Python, Applications Basics of Python Programming	remember	Core Python Programming, Dr. R. Nagsenvana Rao
3	31/03/22	Using the REPL(Shell),	understand	Core Python Programming, Dr. R. Nagsenvana Rao
4	01/04/22	Running Python Scripts	understand	Core Python Programming, Dr. R. Nagsenvana Rao
5	05/04/22	Variables assignment, keywords	understand	Core Python Programming, Dr. R. Nagsenvana Rao
6	06/04/22	Input functions, Output functions	understand	Core Python Programming, Dr. R. Nagsenvana Rao
7	07/04/22	Unit 2 **Types, Operators and Expressions: Types: Integers, strings**	understand	Core Python Programming, Dr. R. Nagsenvana Rao
8	08/04/22	bytes, bytes-array, list, tuple, range	understand	Core Python Programming, Dr. R. Nagsenvana Rao
9	19/04/22	arithmetic operators, **Assignment operators, unary operators**	apply	Core Python Programming, Dr. R. Nagsenvana Rao
10	20/04/22	Relational Operators, Logical Operators	Apply	Core Python Programming, Dr. R. Nagsenvana Rao
11	21/04/22	Bitwise Operators, Membership Operators	Understand	Core Python Programming, Dr. R. Nagsenvana Rao

12	22/04/22	Identity Operators	understand	Core Python Programming, Dr. R. Nagsenvana Rao
12	26/04/22	Expressions and order of evaluations	applying	Core Python Programming, Dr. R. Nagsenvana Rao
13	27/04/22	**Control Flow- if, if-elif-else**	understand	Core Python Programming, Dr. R. Nagsenvana Rao
14	28/04/22	**for, while break, continue, pass**		Core Python Programming, Dr. R. Nagsenvana Rao
15	29/04/22	Unit 3 **Data Structures Lists –** Operations	understand	Core Python Programming, Dr. R. Nagsenvana Rao
16	03/05/22	Slicing, Methods; Tuples	apply	Core Python Programming, Dr. R. Nagsenvana Rao
17	04/05/22	Sets, Dictionaries,	apply	Core Python Programming, Dr. R. Nagsenvana Rao
18	05/05/22	Sequences, Comprehensions	apply	Core Python Programming, Dr. R. Nagsenvana Rao
19	06/05/22	**Default Arguments**, Variable-length arguments	apply	Core Python Programming, Dr. R. Nagsenvana Rao
20	07/05/22	Anonymous Functions,		Core Python Programming, Dr. R. Nagsenvana Rao
21	10/05/22	Fruitful Functions (Function Returning Values)	apply	Core Python Programming, Dr. R. Nagsenvana Rao
22	11/05/22	Scope of the Variables in a Function- Global and Local Variables		Core Python Programming, Dr. R. Nagsenvana Rao
23	12/05/22	Modules: Creating modules, import statement,	apply	Core Python Programming, Dr. R. Nagsenvana Rao
24	13/05/22	Import statement, name spacing, Python packages	apply	Core Python Programming, Dr. R. Nagsenvana Rao,
25	17/05/22	Introduction to PIP,	apply	Core Python Programming, Dr. R. Nagsenvana Rao
26	18/05/22	Installing Packages via PIP	apply	Core Python Programming, Dr. R. Nagsenvana Rao
27	19/05/22	Using Python Packages	apply	Core Python Programming, Dr. R. Nagsenvana Rao

21	20/05/22	Unit 5 **Object-Oriented Programming OOP in Python:** Classes	create	Core Python Programming, Dr. R. Nagsenvana Rao
22	24/05/22	self-variable Methods,	create	Core Python Programming, Dr. R. Nagsenvana Rao
23	25/05/22	Constructor Method	Analysis	Core Python Programming, Dr. R. Nagsenvana Rao
24	26/05/22	Inheritance	Analysis	Core Python Programming, Dr. R. Nagsenvana Rao
25	27/05/22	Overriding Methods	Analysis	Core Python Programming, Dr. R. Nagsenvana Rao
26	31/05/22	Data hiding, Error, and Exceptions	Analysis	Core Python Programming, Dr. R. Nagsenvana Rao
27	01/06/22	Difference between an error and Exception	Analysis	Core Python Programming, Dr. R. Nagsenvana Rao
28	02/06/22	Handling Exception	Analysis	Core Python Programming, Dr. R. Nagsenvana Rao
29	03/06/22	block, Raising Exceptions	Analysis	Core Python Programming, Dr. R. Nagsenvana Rao
30	07/06/22	User Defined Exceptions	Analysis	Core Python Programming, Dr. R. Nagsenvana Rao
31	08/06/22	Unit 6 **Brief Tour of the Standard Library** – Operating System Interface	Apply	Core Python Programming, Dr. R. Nagsenvana Rao
32	09/06/22	Pattern Matching, Mathematics	Apply	Core Python Programming, Dr. R. Nagsenvana Rao
33	10/06/22	Internet Access	Apply	Core Python Programming, Dr. R. Nagsenvana Rao
34	14/06/22	Dates and Times, Data Compression	Apply	Core Python Programming, Dr. R. Nagsenvana Rao
35	15/06/22	Multithreading,	Apply	Core Python Programming, Dr. R. Nagsenvana Rao
36	16/06/22	GUI Programming	Apply	Core Python Programming, Dr. R. Nagsenvana Rao
37	17/06/22	Turtle Graphics Testing: Why testing is required ?,	Create	Core Python Programming, Dr. R. Nagsenvana Rao
38	21/06/22	Basic concepts of testing	Create	Core Python Programming, Dr. R. Nagsenvana Rao

39	22/06/22	Unit testing in Python	Apply	Core Python Programming, Dr. R. Nagsenvana Rao
40	23/06/22	Writing Test cases, Running Tests	Apply	Core Python Programming, Dr. R. Nagsenvana Rao

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P.E.S.College of Engineering, Aurangabad

Department of Electronics and Computer Engineering

Course Coordinator: S.S. Khedgikar

Course Name: Basic Human Rights

Course Code: BTHM403

Academic Year: 2021-2022

Semester: II

	Program Educational Objectives(PEO) and Program Specific Outcomes (PSO)	Year : 2021 - 2022 Semester : II

Program Educational Objectives (PEO)

1	To equip graduates with a strong foundation in engineering sciences and Electronics & Telecommunication Engineering fundamentals to become effective collaborators, researchers and real-time problem solver with technical competencies.
2	Perceive the limitation and impact of engineering solutions in social, legal, environmental, economical and multidisciplinary contexts
3	Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting global competitiveness

Program Specific Outcomes (PSO)

1	Apply basic knowledge related to Electronic Circuits, Embedded & wireless communication Systems and Signal Processing to solve engineering/ societal problems in the field of Electronics and Telecommunication Engineering
2	Recognize and adapt to technical developments and to engage in lifelong learning and develop consciousness for professional, social, legal and ethical responsibilities.
3	Excellent adaptability to the changing industrial and real world requirements

	Program Outcomes (PO)	Year : 20 - 20 Semester : I / II

PROGRAM OUTCOMES: Upon successful completion of this course it is expected that electronics graduate will be able to:

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3.	**Design/ Development of Solutions:**Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** :use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO5.	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an under- standing of the limitations.
PO6.	**The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7.	**Environment and Sustainability:** Understand the impact of professional engineering solutions in soci- etal and environmental contexts and demonstrate knowledge of and need for sustainable develop-ment.
PO8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO9.	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10.	**Communication:** Communicate effectively on complex engineering activities with the engineering com-munity and with society at large, such as being able to comprehend and write

	effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO11.	**Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12.	**Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change

	Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Course Objective : As part of this course, Students	
1.	To train the young minds facing the challenges of the pluralistic society and the rising conflicts and tensions in the name of particularistic loyalties to caste, religion, region and culture.
2.	To give knowledge of the major "signposts" in the historical development of human rights, the range of contemporary declarations, conventions, and covenants.
3.	To enable them to understand the basic concepts of human rights (including also discrimination, equality, etc.), the relationship between individual, group, and national rights.
4.	To develop sympathy in their minds for those who are denied rights.
5.	To make the students aware of their rights as well as duties to the nation
6.	

Course Outcomes : At the end of course, the student will be able to	
CO 1	Students will be able to understand the history of human rights.
CO 2	Students will learn to respect others caste, religion, region and culture.
CO 3	Students will be aware of their rights as Indian citizen.
CO 4	Students will be able to understand the importance of groups and communities in the society.
CO 5	Students will be able to realize the philosophical and cultural basis and historical perspectives of human rights.
CO 6	

	Mapping of Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Mapping of Course Outcomes (COs) with Program Outcomes (POs):

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12
CO 1		✔				✔						
CO 2			✔							✔		
CO 3	✔				✔			✔				
CO 4				✔			✔					✔
CO 5		✔							✔		✔	
CO 6												
CO 7												

Mapping of Course Outcomes (COs) with Program Specific Outcomes (PSO)

	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	✔				
CO2		✔			
CO3	✔				
CO4			✔		
CO5		✔			
CO6					

	Teaching Plan	Year : 20 - 20 Semester : I / II

Bloom Levels: 1. Remember 2.Understand 3. Apply 4.Analysis 5. Create

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. _____ to _____
1	28-3-2022	The Basic Concepts: - Individual, group, civil society	1-1	Shastry, T. S. N., India and Human rights: Reflections, Concept Publishing Company India (P Ltd.), 2005
2	30-3-2022	State, equality, justice	1-1	Shastry, T. S. N., India and Human rights: Reflections, Concept Publishing Company India (P Ltd.), 2005
3	4-4-2022	Human Values, Human rights and Human Duties	2-1	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
4	6-4-2022	Origin, Contribution of American bill of rights	2-2	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
5	11-4-2022	French revolution. Declaration of independence	2-2	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
6	15-4-2022	Rights of citizen, Rights of working and exploited people	3-2	Shastry, T. S. N., India and Human rights: Reflections, Concept Publishing Company India (P Ltd.), 2005

7	18-4-2022	Fundamental rights and economic program	3-3	Shastry, T. S. N., India and Human rights: Reflections, Concept Publishing Company India (P Ltd.), 2005
8	20-4-2022	Society, religion, culture, and their inter relationship	3-3	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
9	25-4-2022	Impact of social structure on human behavior	4-2	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
10	27-4-2022	Social Structure and Social Problems: - Social and communal conflicts and social harmony	4-4	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
11	29-4-2022	rural poverty, unemployment, bonded labor.	4-4	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
12	2-5-2022	Migrant workers and human rights violations	5-2	Shastry, T. S. N., India and Human rights: Reflections, Concept Publishing Company India (P Ltd.), 2005
13	6-5-2022	human rights of mentally and physically challenged	4-1	Shastry, T. S. N., India and Human rights: Reflections, Concept Publishing Company India (P Ltd.), 2005
14	9-5-2022	State, Individual liberty, Freedom and democracy	5-3	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
15	11-5-2022	NGOs and human rights in India: - Land, Water, Forest issues.	5-5	Shastry, T. S. N., India and Human rights: Reflections, Concept Publishing Company India (P Ltd.), 2005

16	13-5-2022	The constitution of India: Preamble	4-1	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
17	16-5-2022	Fundamental rights	4-1	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
18	18-5-2022	Directive principles of state policy	3-4	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
19	25-5-2022	Fundamental duties	1-1	Shastry, T. S. N., India and Human rights: Reflections, Concept Publishing Company India (P Ltd.), 2005
20	31-5-2022	Some other provisions	2-1	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
21	3-6-2022	Universal declaration of human rights and provisions of India	1-2	Nirmal, C.J., Human Rights in India: Historical, Social and Political Perspectives(Law in India), Oxford India
22	6-6-2022	Constitution and law. National human rights commission and state human rights commission.	3-3	Shastry, T. S. N., India and Human rights: Reflections, Concept Publishing Company India (P Ltd.), 2005

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P.E.S.College of Engineering, Aurangabad

Department of Electronics and Computer Engineering

Course Coordinator : **Prof.J.P.Zine**

Course Name : BTETC401 Network Theory

Course Code :Academic Year : BTETC401

Semester I / II : II

	Program Educational Objectives(PEO) and Program Specific Outcomes (PSO)	Year : 20 - 20 Semester : I / II

Program Educational Objectives (PEO)

1	To equip graduates with a strong foundation in engineering sciences and Electronics & Telecommunication Engineering fundamentals to become effective collaborators, researchers and real-time problem solver with technical competencies.
2	Perceive the limitation and impact of engineering solutions in social, legal, environmental, economical and multidisciplinary contexts.
3	Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting global competitiveness.

Program Specific Outcomes (PSO)

1	Apply basic knowledge related to Electronic Circuits, Embedded & wireless communication Systems and Signal Processing to solve engineering/ societal problems in the field of Electronics and Telecommunication Engineering.
2	Recognize and adapt to technical developments and to engage in lifelong learning and develop consciousness for professional, social, legal and ethical responsibilities.

3	Excellent adaptability to the changing industrial and real world requirements.

	Program Outcomes (PO)	Year : 20 - 20 Semester : I / II

PROGRAM OUTCOMES: Upon successful completion of this course it is expected that electronics graduate will be able to:

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3.	**Design/ Development of Solutions:**Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** :use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO5.	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an under- standing of the limitations.
PO6.	**The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7.	**Environment and Sustainability:** Understand the impact of professional engineering solutions in soci- etal and environmental contexts and demonstrate knowledge of and need for sustainable develop-ment.
PO8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO9.	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.
PO10.	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO11.	**Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12.	**Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change

	Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Course Objective : As part of this course, Students	
1.	To learn about the basic laws of electric circuits as well as the key fundamentals of the communication channels, namely transmission lines.
2.	To understand the need of simplification techniques of complicated circuits
3.	To learn about the comprehensive insight into the principle techniques available for characterizing circuits, networks and their implementation in practice

4.	To learn about the use of mathematics, need of different transforms and usefulness of differential equations for analysis of networks.
5.	To train the students for handling analog filter design through theory of NA along with practical, this is basic requirement of signal processing field.

Course Outcomes : At the end of course, the student will be able to	
CO1	Apply knowledge of mathematics to solve numerical based on network simplification and it will be used to analyze thesame.
CO2	Design passive filters and attenuators theoretically and practically. To apply knowledge for design of active filters as well as digital filters and even extend this to advance adaptive filters.
CO3	Identify issues related to transmission of signals, analyze different RLC networks.
CO4	Find technology recognition for the benefit of the society.

	Mapping of Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Mapping of Course Outcomes (COs) with Program Outcomes (POs):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	YES	YES	YES		YES						YES	

CO 2	YES	YES	YES	YES								YES
CO 3	YES	YES	YES	YES		YES		YES	YES			
CO 4		YES		YES	YES	YES		YES	YES	YES		

Mapping of Course Outcomes (COs) with Program Specific Outcomes (PSO)					
	PSO1	PSO2	PSO3	PSO4	PO5
CO1	YES	YES	YES		
CO2	YES	YES	YES		
CO3	YES		YES		
CO4	YES	YES			

	Teaching Plan	Year : 20 - 20 Semester : I / II

Bloom Levels: 1. Remember 2.Understand 3. Apply 4.Analysis 5. Create

No. of Lecture	**Date**	**Topic / Sub - Topic**	**Course Outcome No. and Bloom Level**	**Refer (Text Book, Website) Page no. ____ to ____**

1		UNIT – 1 Network Theorems: 07 Hours Basic nodal and mesh analysis, linearity,		
2		superposition and source transformation,		
3		Thevinin‟s, Norton‟s Threoms		D Roy Choudary, “Network and Systems” 1st edition, New Age International,1988
4		maximum power transfer theorem and useful circuit analysis techniques,		
5		network topology		
6		introduction to SPICE in circuit analysis.		
7		introduction to SPICE in circuit analysis.		

8		UNIT – 2 Transient Analysis and Frequency Domain Analysis: 07 Hours Transient Analysis: Source free RL and RC circuits		
9		unit step forcing function		
10		,source free parallel and series RLC circuit,		
11		response of the RLC circuit		D Roy Choudary, "Network and Systems" 1st edition, New Age International,1988
12		lossless LC complete circuit.		
13		Frequency Domain Analysis: The phasor concept		
14		sinusoidal steady state analysis; AC circuit power analysis		

15		UNIT – 3 Laplace transform and its circuit applications: 07 Hours Laplace transform, initial and final value theorem circuit analysis in s domain, frequency response.		
16		Laplace transform,		Hayt, Kemmerley and Durbin, "Engineering Circuit Analysis"
17		initial and final value theorem		
18		circuit analysis in s domain		
19		circuit analysis in s domain		
20		frequency response.		
21		frequency response.		

22		UNIT – 4 Two Port Networks: 07 Hours Two Port Networks: Z, Y, h and ABCD parameters analysis of interconnected (magnetically coupled) two port, three terminal networks.		
23		h and ABCD parameters		
24		analysis of interconnected (magnetically coupled) two port,		
25		analysis of interconnected (magnetically coupled) two port,		Hayt, Kemmerley and Durbin, "Engineering Circuit Analysis"
26		three terminal networks.		
27		three terminal networks.		
28		problems		

29		UNIT – 5 State Variable Analysis and RL & RC Network Synthesis: 07 Hours State Variable Analysis: State variables and normal-form equations, .		
30		State Variable Analysis: State variables and normal-form equations,		
31		matrix-based solution of the circuit equations		D Roy Choudary, “Network and Systems” 1st edition, New Age International,1988
32		RL & RC Network Synthesis: Synthesis of one-port networks,		
33		RL & RC Network Synthesis: Synthesis of one-port networks,		
34		transfer function synthesis,		
35		basics of filter design.		

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P.E.S.College of Engineering, Aurangabad

Department of Electronics and Computer Engineering

Course Coordinator :Prof.V.R Kshirsagar

Course Name : Computer Architecture

Course Code :BTETC503

Academic Year : 2021-2022

Semester I / II : I

	Program Educational Objectives(PEO) and Program Specific Outcomes (PSO)	Year : 20 - 20 Semester : I / II

Program Educational Objectives (PEO)

	To equip graduates with a strong foundation in engineering sciences and Electronics & Telecommunication Engineering fundamentals to become effective collaborators, researchers and real-time problem solver with technical competencies.
	Perceive the limitation and impact of engineering solutions in social, legal, environmental, economical and multidisciplinary contexts
	Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting global competitiveness.

Program Specific Outcomes (PSO)

1	Apply basic knowledge related to Computer to solve engineering/ societal problems in the field of Electronics and Computer Engineering.
2	Recognize and adapt to technical developments and to engage in lifelong learning and develop consciousness for professional, social, legal and ethical responsibilities.
3	Excellent adaptability to the changing industrial and real world requirements

	Program Outcomes (PO)	Year : 20 - 20 Semester : I / II

PROGRAM OUTCOMES: Upon successful completion of this course it is expected that electronics graduate will be able to:

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3.	**Design/ Development of Solutions:**Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** :use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO5.	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an under- standing of the limitations.
PO6.	**The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7.	**Environment and Sustainability:** Understand the impact of professional engineering solutions in soci- etal and environmental contexts and demonstrate knowledge of and need for sustainable develop-ment.
PO8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO9.	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10.	**Communication:** Communicate effectively on complex engineering activities with the engineering com-munity and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO11.	**Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12.	**Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change

	Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Course Outcomes : At the end of course, the student will be able to	
CO1	learn how computers work
CO2	know basic principles of computer"s working
CO3	analyze the performance of computers
CO4	know how computers are designed and built
CO5	Understand issues affecting modern processors (caches, pipelines etc.)

	Mapping of Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Mapping of Course Outcomes (COs) with Program Specific Outcomes (PSO)					
	PO1	PO2	PO3	PO4	PO5
CO1	YES				
CO2	YES	YES			
CO3	YES	YES			
CO4	YES	YES	YES		
CO5	YES	YES	YES		

	Teaching Plan	Year : 20 - 20 Semester : I / II

Bloom Levels: 1. Remember 2.Understand 3. Apply 4.Analysis 5. Create

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1	11/11/21	Basic Structure of Computers,	1,2&1,2	V.Carl Hammacher, "Computer Organisation"
2	15/11/21	Functional units,	1,2&1,2	—-DO—--
3	17/11/21	software, performance issues software,	2,3&1,2	—-DO—--
4	22/11/21	machine instructions and programs, Types of instructions,	1,2&1,2	—-DO—--
5	1/12/21	Instruction sets: Instruction formats, Assembly language,	1,2&1,2	—-DO—--
6	7/12/21	Stacks, Queues, Subroutines	1,2&1,2	—-DO—--
7	8/12/21	Processor organization	4&1,2	A.S.Tanenbum, "Structured Computer Organisation",
8	13/12/21	Processor organization,	4&1,2	—-DO—--
9	14/12/21	Information representation,.	2&1,2	—-DO—--
10	22/12/21	Information representation,.	2&1,2	—-DO—--
11	27/12/21	number formats	2&1,2	—-DO—--
12	29/12/21	number formats	2&1,2	—-DO—--
13	11/1/22	Multiplication & division, ALU design,	4&1,2,34	—-DO—--
14	12/1/22	Floating Point arithmetic	4&1,2	—-DO—--
15	17/1/22	IEEE 754 floating point formats Control Design,	4&1,2	—-DO—--

16	18/1/22	Instruction sequencing, Interpretation	2&1,2	—-DO—--
17	19/1/22	Hard wired control - Design methods,	4&1,2,3, 4	—-DO—--
18	24/1/22	CPU control unit.	4&1,2	—-DO—--
19	25/1/22	Memory organization, device characteristics,	4&1,2	Hayes J.P, "Computer Architecture and Organization"
20	31/1/22	RAMS, ROM,	4&1,2	—-DO—--
21	31/1/22	Memory management,	4&1,2	—-DO—--
22	1/2/22	Concept of Cache &	4&1,2	—-DO—--
23	1/2/22	associative memories,	4&1,2	—-DO—--
24	2/2/22	Virtual memory	4&1,2	—-DO—--
25	2/2/22	System organization	5&1,2	—-DO—--
26	7/2/22	System organization,	5&1,2	—-DO—--
27	7/2/22	Input - Output systems Interrupt	5&1,2	—-DO—--
28	8/2/22	DMA	5&1,2	—-DO—--
29	8/2/22	Standard I/O interfaces	5&1,2	—-DO—--
30	9/2/22	Standard I/O interfaces	5&1,2	—-DO—--
31	9/2/22	Parallel processing	5&1,2	—-DO—--
32	12/2/22	Concept of parallel processing,	5&1,2	—-DO—--
33	12/2/22	Concept of parallel processing,	5&1,2	—-DO—--
34	14/2/22	Pipelining,	5&1,2	—-DO—--
35	15/2/22	Forms of parallel processing,	5&1,2	—-DO—--
36	15/2/22	interconnect network	5&1,2	—-DO—--

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P.E.S.College of Engineering, Aurangabad

Department of Electronics and Computer Engineering

Course Coordinator : Prof. P.K.Ghuge

Course Name : Digital Electronics

Course Code : BTETC303

Academic Year : 2021-22

Semester I / II : I

	Program Educational Objectives(PEO) and Program Specific Outcomes (PSO)	Year : 20 - 20 Semester : I / II

Program Educational Objectives (PEO)

1.	To equip graduates with a strong foundation in engineering sciences and Electronics & Telecommunication Engineering fundamentals to become effective collaborators, researchers and real-time problem solvers with technical competencies.
2.	Perceive the limitation and impact of engineering solutions in social, legal, environmental, economical and multidisciplinary contexts.
3.	Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting global competitiveness.

Program Specific Outcomes (PSO)

1.	Specify, design, build and test analog, digital and embedded systems for signal processing
2.	Understand and architect wired and wireless analog and digital communication systems as per specifications, and determine their performance.
3.	Ability to design and implement the acquired technical knowledge with proficiency in logical programming for applications in electronics engineering.
4.	Apprehend and analyze specific engineering problems by applying the knowledge of basic sciences, engineering mathematics and engineering fundamentals.
5.	Ability to communicate effectively with excellent interpersonal skills and demonstrate the practice of professional ethics for societal benefit.

	Program Outcomes (PO)	Year : 20 - 20 Semester : I / II

PROGRAM OUTCOMES: Upon successful completion of this course it is expected that electronics graduate will be able to:

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3.	**Design/ Development of Solutions:**Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** :use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO5.	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an under- standing of the limitations.
PO6.	**The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7.	**Environment and Sustainability:** Understand the impact of professional engineering solutions in soci- etal and environmental contexts and demonstrate knowledge of and need for sustainable develop-ment.
PO8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO9.	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.
PO10.	**Communication:** Communicate effectively on complex engineering activities with the engineering com-munity and with society at large, such as being able to comprehend and write

	effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO11.	**Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12.	**Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change

	Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Course Objective : As part of this course, Students	
1.	To acquaint the students with the fundamental principles of two-valued logic and various devices used to implement logical operations on variables.
2.	To lay the foundation for further studies in areas such as communication, VHDL, computer.
3.	Develop state diagrams Synchronous Sequential Circuits.
4.	Analyze Mealy and Moore Models.
5.	To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
6.	To prepare students to perform the analysis and design of various digital electronic circuits

Course Outcomes : At the end of course, the student will be able to	
CO1	Use the basic logic gates and various reduction techniques of digital logic circuit in detail.
CO2	Design combinational and sequential circuits.
CO3	Design and implement hardware circuits to test performance and application.
CO4	Understand the architecture and use of VHDL for basic operations and Simulate using simulation software.

	Mapping of Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Mapping of Course Outcomes (COs) with Program Outcomes (POs):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓			✓				✓				
CO2		✓		✓			✓		✓			
CO3		✓			✓			✓			✓	✓
CO4		✓		✓		✓			✓		✓	

Mapping of Course Outcomes (COs) with Program Specific Outcomes (PSO)

	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓		
CO2		✓		✓	
CO3		✓			
CO4	✓		✓	✓	✓
CO5	✓				✓
CO6		✓	✓		

	Teaching Plan	Year : 20 - 20 Semester : I / II

Bloom Levels: 1. Remember 2.Understand 3. Apply 4.Analysis 5. Create

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1		Introduction to Digital Electronics ,Logic Gates	**1,2,3**	N.G.Palan
2		Implementation of Logic Gates	**1,2,3**	N.G.Palan
3		Implementation of Universal Logic Gates	**1,2,3**	N.G.Palan
4		Standard representations for logic functions	**1,2,3**	N.G.Palan
5		k map representation of logic functions SOP	**2,3**	N.G.Palan,S.P.Bali
6		k map representation of logic functions POS	**2,3**	N.G.Palan,S.P.Bali
7		minimization of logical functions for min-terms and max-terms	**2,3,4**	N.G.Palan,S.P.Bali
8		Problem Solving	**2,3,4**	N.G.Palan,S.P.Bali
9		don't care conditions	**2,3,4**	N.G.Palan,S.P.Bali
10		Arithmetic Circuits - HA,HS,FA,FS	**2,3,4**	B.M.Bakwad
11		BCD - to - 7 segment decoder	**2,3**	B.M.Bakwad
12		Code converters - G to B,B to G	**2,3**	B.M.Bakwad
13		Code converters - B to EX-3,EX3 to B	**2,3**	B.M.Bakwad
14		Adders and their use as subtractor	**2,3**	B.M.Bakwad
15		look ahead carry, ALU	**2,3**	B.M.Bakwad
16		Digital Comparator	**2,3**	B.M.Bakwad
17		Parity generators/checkers	**2,3**	B.M.Bakwad
18		Multiplexer and Multiplexer Tree	**3,4,5**	B.M.Bakwad
19		Design of Multiplexers	**3,4,5**	B.M.Bakwad
20		Demultiplexers, Decoders.	**3,4,5**	B.M.Bakwad
21		1 Bit Memory Cell, Clocked SR	**2**	N.G.Palan,A.P.Godse
22		JK, MS J-K flip flop, D and T flip-flops	**2**	N.G.Palan,A.P.Godse

23		Use of preset and clear terminals, Excitation Table for flip flops	**2,3**	N.G.Palan,A.P.Godse
24		Conversion of flip flops	**2,3**	N.G.Palan,A.P.Godse
25		Registers, Shift registers,	**3,4,5**	N.G.Palan,A.P.Godse
26		Asynchronous counters	**3,4,5**	N.G.Palan,A.P.Godse
27		Design Problems on Asynchronous counters	**3,4,5**	N.G.Palan,A.P.Godse
28		synchronous counters	**3,4,5**	N.G.Palan,A.P.Godse
29		Design Problems on synchronous counters	**3,4,5**	N.G.Palan,A.P.Godse
30		up/down counters- Asynchronous ,Synchronous	**3,4,5**	N.G.Palan,A.P.Godse
31		Sequence Generators, ripple Counter , definitions of lock out, Clock Skew, and Clock jitter	**1,2,3**	N.G.Palan,A.P.Godse
32		State diagram, State table, State reduction, State assignment	**1,2,3**	A.P.Godse
33		Mealy and Moore machines representation,	**3,4,5**	A.P.Godse
34		Implementation	**3,4,5**	A.P.Godse
35		finite state machine implementation,	**3,4,5**	A.P.Godse
36		Sequence detector.	**3,4,5**	A.P.Godse
37		Classification of logic families, Characteristics of digital ICs-Speed of operation,	**1,2**	https://in.video.search.yahoo.com/video/play?p=logic+family+notes&vid=d6fa2ebf98e6ea8cf07273254d3485b1&turl=https%3A%2F%2Ftse1.mm.bing.net%2Fth%3Fid%3DOVP.MEfpzf33T09BeROGTqkI5gEsCo%26pid%3DApi%26h%3D168%26w%3D300%26c%3D7%26rs%3D1&rurl=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3D9Rt7iuqSVJ8&tit=Characteristics+of+%3Cb%3ELogic%3C%2Fb%3E+Families&c=4&h=168&w=300&l=694&sigr=kF84tKtHB4mv&sigt=Th2y2wA_hHNl&sigi=K86miiHm6NnL&ct=p&age=1517034773&fr2=p%3As%2Cv%3Av&fr=mcafee&type=E211IN885G0&tt=b
38		power dissipation, figure of merit, fan in, fan out, current and voltage parameters, noise immunity, operating temperatures and power supply requirements	**1,2**	
39		TTL logic, Operation of TTL NAND gate, active pull up, wired AND, open collector output, unconnected inputs.	**1,2**	B.M.Bakwad
40		Tri-State logic. CMOS logic – CMOS inverter, NAND, NOR gates, unconnected inputs, wired logic, open drain output.	**1,2**	B.M.Bakwad

41		Interfacing CMOS and TTL, Comparison table of Characteristics of TTL, CMOS, ECL, RTL, I2 L and DCTL	**1,2**	B.M.Bakwad
42		Programmable logic devices: Detail architecture, Study of PROM, PAL, PLA, Designing combinational circuits using PLDs	**1,2**	B.M.Bakwad
43		General Architecture of FPGA and CPLD Semiconductor memories: memory organization and operation, expanding memory size	**1,2**	B.M.Bakwad
44		Classification and characteristics of memories, RAM, ROM, EPROM, EEPROM, NVRAM, SRAM, DRAM.	**1,2**	B.M.Bakwad
45		Introduction to VHDL: Behavioral – data flow, and algorithmic and structural description,	**1,2**	Pedroni V.A
46		lexical elements, data objects types, attributes, operators	**1,2**	Pedroni V.A
47		VHDL coding examples, combinational circuit design examples in VHDL and simulation.	**3,4,5**	Pedroni V.A

Dr. Babasaheb Ambedkar Technological University, Lonere- 402103

P.E.S.College of Engineering, Aurangabad

Department of Electronics and Computer Engineering

Course Coordinator :Prof.V.R Kshirsagar

Course Name : Electronic Devices and Circuits

Course Code : BTETC302

Academic Year : 2021-2022

Semester I / II : I

	Program Educational Objectives(PEO) and Program Specific Outcomes (PSO)	Year : 20 - 20 Semester : I / II

Program Educational Objectives (PEO)

1	To equip graduates with a strong foundation in engineering sciences and Electronics & Telecommunication Engineering fundamentals to become effective collaborators, researchers and real-time problem solver with technical competencies.
2	Perceive the limitation and impact of engineering solutions in social, legal, environmental, economical and multidisciplinary contexts
3	Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting global competitiveness.

Program Specific Outcomes (PSO)

1	Apply basic knowledge related to Electronic Circuits to solve engineering/ societal problems in the field of Electronics and Telecommunication Engineering.
2	Recognize and adapt to technical developments and to engage in lifelong learning and develop consciousness for professional, social, legal and ethical responsibilities.
3	Excellent adaptability to the changing industrial and real world requirements

	Program Outcomes (PO)	Year : 20 - 20 Semester : I / II

PROGRAM OUTCOMES: Upon successful completion of this course it is expected that electronics graduate will be able to:

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3.	**Design/ Development of Solutions:**Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** :use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO5.	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an under- standing of the limitations.
PO6.	**The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7.	**Environment and Sustainability:** Understand the impact of professional engineering solutions in soci- etal and environmental contexts and demonstrate knowledge of and need for sustainable develop-ment.
PO8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO9.	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10.	**Communication:** Communicate effectively on complex engineering activities with the engineering com-munity and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO11.	**Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12.	**Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change

	Course Objective and Course Outcomes	Year : 2021 - 2022 Semester : I

Course Objective : As part of this course, Students	
1.	To introduce Static characteristics of ideal two terminal and three terminal devices.
2.	To introduce semiconductor devices BJT, JFET and MOSFET, their characteristics, operations, circuits and applications.
3.	To analyze and interpret BJT, FET and MOSFET circuits for small signal at low and high frequencies
4.	To simulate electronics circuits using computer simulation software and verify desired results.

Course Outcomes : At the end of course, the student will be able to	
CO1	Comply and verify parameters after exciting devices by any stated method.
CO2	Implement circuit and test the performance
CO3	Analyze BJT, JFET and MOSFET for various applications.
CO4	Analyze Feedback amplifiers and oscillators..

	Mapping of Course Objective and Course Outcomes	Year : 2021 - 2022 Semester : I

Mapping of Course Outcomes (COs) with Program Outcomes (POs):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	YES		YES			YES						YES
CO2	YES	YES	YES	YES	YES							
CO3	YES		YES			YES	YES					
CO4	YES	YES		YES								

Mapping of Course Outcomes (COs) with Program Specific Outcomes (PSO)

	PO1	PO2	PO3	PO4	PO5
CO1	YES	YES	YES		
CO2	YES	YES			
CO3	YES	YES	YES		
CO4	YES	YES	YES		

	Teaching Plan	Year : 20 - 20 Semester : I / II

Bloom Levels: 1. Remember 2.Understand 3. Apply 4.Analysis 5. Create

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1	22/11/21	BJT: construction, working, characteristics, stability factor.	**1,1&2**	Boystad,Electronic Devices and Circuits
2	23/11/21	Transistor as switch, Transistor configurations, current gain equation,	**1,1&2**	—-do—--
3	25/11/21	BJT Biasing and basic amplifier configurations: Need for biasing BJT, BJT Biasing and basic amplifier configurations: Need for biasing BJT,	**1,1&2**	—-do—--
4	26/11/21	Transistor as amplifier , Analysis of Single Stage Amplifier, RC coupled Amplifiers,	**1,3,3&4**	—-do—--
5	26/11/21	Effects of bypass and coupling capacitors, Frequency response of CE amplifier,	**1,1&2**	—-do—--
6	7/12/22	Emitter follower, Cascaded Amplifier, Need for multistage amplifiers	**1,1&2**	—-do—--
7	9/12/22	suitability of CE, CC and CB configurations in multistage amplifiers.	**1,1&2**	—-do—--
8	4/1/22	JFET and its characteristics, Pinch off voltage, Drain saturation current,	**2,1&2**	—-do—--
9	5/1/22	JFET amplifiers, ,Biasing the FET, The FET as VVR.	**1,1&2**	—-do—--
10	5/1/22	CS,CD,CG amplifiers ,their analysis using small signal JFET model	**2,3,3&4**	—-do—--
11	7/1/22	Small signal operation and models,	**2,3**	—-do—--
12	7/1/22	MOSFET: Overview of DMOSFET, EMOSFET, Power MOSFET, n MOSFET, p - MOSFET and CMOS devices, Handling precautions of CMOS devices, MOSFET as an Amplifier and Switch,	**2,1&2**	—-do—--
13	12/1/22	Biasing in MOSFET, Single stage MOS amplifier, MOSFET capacitances, CMOS Inverter,	**2,1&2**	—-do—--
14	12/1/22	Comparison of FET with MOSFET and BJT w.r.t. to device and Circuit parameter.	**3,3**	—-do—--

15	14/1/22	Introduction, classification of power amplifiers -A, B, AB, C and D,	**4,1&2**	—-do—--
16	18/1/22	transformer coupled class A amplifier,	**4,1&2**	—-do—--
17	19/1/22	Class B push pull	**4,1&2**	—-do—--
18	19/1/22	complementary symmetry amplifier, efficiency,,	**4,1&2**	—-do—--
19	20/1/22	calculation of power output, power dissipation	**4,3**	—-do—--
20	20/1/22	cross over distortion and its elimination methods	**4,3**	—-do—--
21	25/1/22	need of heat sink and its design.	**4,3**	—-do—--
22	28/1/22	Principle of Negative feedback in electronic circuits,,	**4,1&2**	—-do—--
23	28/1/22	Voltage series, Voltage shunt,	**4,1&2**	—-do—--
24	1/2/22	Current series, Current shunt types of Negative feedback,	**4,1&2**	—-do—--
25	2/2/22	Typical transistor circuits effects of Negative feedback on Input and Output impedance,	**4,1&2**	—-do—--
26	8/2/22	Voltage and Current gains, Bandwidth	**4,1&2**	—-do—--
27	9/2/22	Noise and Distortion	**4,1&2**	—-do—--
28	11/2/22	Revision	**4**	—-do—--
29	11/2/22	Principle of Positive feedback, Concept of Stability in electronics circuits,	**4,1&2**	—-do—--
30	14/2/22	Barkhausen criteria for oscillation,RC	**4,1&2**	—-do—--
31	17/2/22	Clapp, Wien Bridge, Colpitt,	**4,1&2**	—-do—--
32	21/2/22	Hartley, Tuned LC,	**4,1&2**	—-do—--
33	22/2/22	UJT, Relaxation Oscillators. Transistor application: Discrete transistor	**4,1&2**	—-do—--
34	25/2/22	voltage Regulation, series voltage regulator, shunt voltage regulator.	**4,1&2**	—-do—--
35	25/2/22	IC Voltage Regulators: Three terminal voltage regulator, Variable voltage regulator	**4,1&3**	—-do—--

Dr. Babasaheb Ambedkar Technological University, Lonere- 402103

P.E.S.College of Engineering, Aurangabad

Department of Electronics and Computer Engineering

Course Coordinator: Niteen T. Kolambikar

Course Name: Electromagnetic Field Theory (EMFT)

Course Code: Academic Year: BTEXC501 (2022)

Semester I / II: I

	Program Educational Objectives(PSO) and Program Specific Outcomes (PSO)	Year : 2021 - 2022 Semester : I / II

Program Educational Objectives (PEO)

PEO 1.	Students will be able to engage in life-long learning and research including supportive and responsible roles on multi-disciplinary tasks.
PEO 2.	Students will acquire, use and develop skills as required for effective professional and societal practices and leadership quality.
PEO 3.	Students will be able to create a new dimension of innovation and entrepreneurship.
PEO 4.	Students will acquire, use and develop skills as required for effective professional and societal practices and leadership quality.

Program Specific Outcomes (PSO)

PSO 1.	Students will be able to understand the impact of engineering problems, solutions in a global and societal context.
PSO 2.	Students will be able to develop confidence for self-education and ability to engage in life-long learning.
PSO 3.	Students will be able to apply knowledge to design a system, component or process to meet desired needs within realistic constraints.
PSO 4.	Students will be able to communicate effectively through verbally, technical writing, reports and presentation.

	Program Outcomes (PO)	Year : 2021 - 2022 Semester : I / II

PROGRAM OUTCOMES: Upon successful completion of this course it is expected that electronics graduate will be able to:

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3.	**Design/ Development of Solutions:**Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** :use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO5.	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an under- standing of the limitations.
PO6.	**The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7.	**Environment and Sustainability:** Understand the impact of professional engineering solutions in soci- etal and environmental contexts and demonstrate knowledge of and need for sustainable develop-ment.
PO8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO9.	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3.	**Design/ Development of Solutions:**Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** :use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO10.	**Communication:** Communicate effectively on complex engineering activities with the engineering com-munity and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO11.	**Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12.	**Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change

	Course Objective and Course Outcomes	Year : 2021 - 2022 Semester : I / II

Course Objective : As part of this course, Students	
1.	Learners can be able to explore their knowledge in the area of EM Waves and its analysis.
2.	To learn basic coordinate system, significance of divergence, gradient, curl and its applications to EM Waves.
3.	To understand the boundary conditions for different materials /surfaces.
4.	To get insight on finding solution for non-regular geometrical bodies using Finite Element Method, Method of Moments, Finite Difference Time Domain.
5.	To get the basics of microwave, transmission lines and antenna parameters.
6.	Students get acquainted with different physical laws and theorems and provide basic Platform for upcoming communication technologies.

Course Outcomes : At the end of course, the student will be able to	
CO 1	Understand characteristics and wave propagation on high frequency transmission lines
CO 2	Carryout impedance transformation on TL
CO 3	Use sections of transmission line sections for realizing circuit elements
CO 4	Characterize uniform plane wave
CO 5	Calculate reflection and transmission of waves at media interface
CO 6	Analyze wave propagation on metallic waveguides in modal form

	Mapping of Course Objective and Course Outcomes	Year : 2021 - 2022 Semester : I / II

Mapping of Course Outcomes (COs) with Program Outcomes (POs):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**X**		**X**	**X**			**X**	**X**	**X**	**X**		**X**
CO2		**X**		**X**		**X**		**X**	**X**	**X**		**X**
CO3	**X**	**X**	**X**	**X**		**X**	**X**			**X**	**X**	**X**
CO4	**X**				**X**		**X**		**X**		**X**	**X**
CO5			**X**		**X**	**X**		**X**		**X**	**X**	

Mapping of Course Outcomes (COs) with Program Outcomes (POs):												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	X		X	X			X	X	X	X		X
CO2		X		X		X		X	X	X		X
CO3	X	X	X	X		X	X			X	X	X
CO6			X		X			X	X			
CO7				X		X						X

Mapping of Course Outcomes (COs) with Program Specific Outcomes (PSO)					
	PO1	PO2	PO3	PO4	PO5
CO1	X	X		X	X
CO2	X		X		X
CO3	X	X	X	X	X
CO4		X	X		X
CO5	X				
CO6	X	X		X	X

	Teaching Plan	Year : 2021 - 2022 Semester : I

Bloom Levels: 1. Remember 2.Understand 3. Apply 4.Analysis 5. Create

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1	18.09.2021	Introduction to the subject & Over all syllabus	1&2	Given University Syllabus
2	21.09.2021	UNIT-1 : Maxwell's Equations Basics of Maxwell's Equation & Vectors,	1,2&4	W. H. Hayt, "Engineering Electromagnetics
3	22.09.2021	Vector calculus	1,2&4	Edminister, Schaum series, "Electromagnetics
4	25.09.2021	Numerical on Vector Calculus.	1,2&4	Sarvate, "Electromagnetism
5	28.09.2021	Basic laws of Electromagnetic	1,2&4	R.K. Shevgaonkar,
6	29.09.2021	Details of Maxwell's Equations	1,2&4	E.C. Jordan & K.G. Balmain,
7	02.10.2021	Boundary conditions at Media Interface	1,2&4	Narayana Rao, N: Engineering Electromagnetics
8	05.10.2021	UNIT-2: Uniform Plane Wave Introduction to the Uniform plane wave	1,2&4	David Cheng, "Electromagnetics
9	06.10.2021	Uniform plane wave, Propagation of wave	1,2&4	Sadiku, "Elements of Electromagnetics
10	09.10.2021	Wave polarization, Poincare's Sphere,	1,2&4	Krauss, "Electromagnetics",
11	12.10.2021	Wave propagation in conducting medium,	1,2&4	W. H. Hayt, "Engineering Electromagnetics
12	13.10.2021	phase and group velocity	1,2&4	Edminister, Schaum series, "Electromagnetics
13	16.10.2021	Power flow and Poynting vector	1,2&4	Sarvate, "Electromagnetism

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1	18.09.2021	Introduction to the subject & Over all syllabus	1&2	Given University Syllabus
2	21.09.2021	UNIT-1 : Maxwell's Equations Basics of Maxwell's Equation & Vectors,	1,2&4	W. H. Hayt, "Engineering Electromagnetics
3	22.09.2021	Vector calculus	1,2&4	Edminister, Schaum series, "Electromagnetics
4	25.09.2021	Numerical on Vector Calculus.	1,2&4	Sarvate, "Electromagnetism
14	19.10.2021	Numerical on Poynting vector	1,2&4	R.K. Shevgaonkar,
15	20.10.2021	Surface current and power loss in a conductor	1,2&4	E.C. Jordan & K.G. Balmain,
16	23.10.2021	UNIT – 3: Transmission Lines Basics of Transmission Lines & Equations of Voltage and Current on TX line,	1,2&4	Narayana Rao, N: Engineering Electromagnetics
17	25.10.2021	Numerical on Equations of Voltage and Current on TX line	1,2&4	David Cheng, "Electromagnetics
18	26.10.2021	Propagation constant and characteristic Impedance, and reflection coefficient .	1,2&4	Sadiku, "Elements of Electromagnetics
19	30.10.2021	VSWR(Voltage Standing Wave Ratio)	1,2&4	Krauss, "Electromagnetics" ,
20	02.11.2021	Impedance Transformation on Loss-less and Low loss Transmission line,	1,2&4	W. H. Hayt, "Engineering Electromagnetics
21	03.11.2021	Power transfer on TX line	1,2&4	Edminister, Schaum series, "Electromagnetics
22	06.11.2021	Smith Chart, Admittance Smith Chart	1,2&4	Sarvate, "Electromagnetism

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1	18.09.2021	Introduction to the subject & Over all syllabus	1&2	Given University Syllabus
2	21.09.2021	UNIT-1 : Maxwell's Equations Basics of Maxwell's Equation & Vectors,	1,2&4	W. H. Hayt, "Engineering Electromagnetics
3	22.09.2021	Vector calculus	1,2&4	Edminister, Schaum series, "Electromagnetics
4	25.09.2021	Numerical on Vector Calculus.	1,2&4	Sarvate, "Electromagnetism
23	09.11.2021	Practice of Smith Chart & Admittance Smith chart on Smith chart Papers.	1,2&4	R.K. Shevgaonkar,
24	10.11.2021	Applications of transmission lines: Impedance Matching, use transmission line Sections as circuit elements.	1,2&4	E.C. Jordan & K.G. Balmain,
25	13.11.2021	UNIT – 4: Plane Waves at a Media Interface Introduction to Plane waves & Media Interface	1,2&4	Narayana Rao, N: Engineering Electromagnetics
26	17.11.2021	Mathematical analysis of Plane waves & Media Interface	1,2&4	David Cheng, "Electromagnetics
27	18.11.2021	Plane wave in arbitrary direction, Reflection and refraction at dielectric interface	1,2&4	Sadiku, "Elements of Electromagnetics
28	20.11.2021	Total internal reflection. Also Comparisons between Reflection, Refraction & Internal Reflection.	1,2&4	Krauss, "Electromagnetics",
29	22.11.2021	wave polarization at media interface	1,2&4	W. H. Hayt, "Engineering Electromagnetics
30	23.11.2021	Mathematical analysis of wave polarization	1,2&4	Edminister, Schaum series, "Electromagnetics

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
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2	21.09.2021	UNIT-1 : Maxwell's Equations Basics of Maxwell's Equation & Vectors,	1,2&4	W. H. Hayt, "Engineering Electromagnetics
3	22.09.2021	Vector calculus	1,2&4	Edminister, Schaum series, "Electromagnetics
4	25.09.2021	Numerical on Vector Calculus.	1,2&4	Sarvate, "Electromagnetism
31	27.11.2021	Reflection from a conducting boundary.	1,2&4	Sarvate, "Electromagnetism
32	30.11.2021	Numerical on all types of reflections & Polarizations.	1,2&4	R.K. Shevgaonkar,
33	01.12.2021	UNIT – 5: Wave propagation Basics of Wave polarization & its types.	1,2&4	E.C. Jordan & K.G. Balmain,
34	04.12.2021	Wave propagation in parallel plane waveguide	1,2&4	Narayana Rao, N: Engineering Electromagnetics
35	06.12.2021	Analysis of waveguide general approach	1,2&4	David Cheng, "Electromagnetics
36	07.06.2021	Rectangular waveguide, Modal propagation in rectangular waveguide	1,2&4	Sadiku, "Elements of Electromagnetics
37	11.12.2021	Surface currents on the waveguide walls	1,2&4	Krauss, "Electromagnetics",
38	14.12.2021	Field visualization	1,2&4	W. H. Hayt, "Engineering Electromagnetics
39	15.12.2021	Attenuation in waveguide	1,2&4	Edminister, Schaum series, "Electromagnetics

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1	18.09.2021	Introduction to the subject & Over all syllabus	1&2	Given University Syllabus
2	21.09.2021	UNIT-1 : Maxwell's Equations Basics of Maxwell's Equation & Vectors,	1,2&4	W. H. Hayt, "Engineering Electromagnetics
3	22.09.2021	Vector calculus	1,2&4	Edminister, Schaum series, "Electromagnetics
4	25.09.2021	Numerical on Vector Calculus.	1,2&4	Sarvate, "Electromagnetism
40	18.12.2021	Numerical & Mathematical Modules on above topics.	1,2&4	Sarvate, "Electromagnetism
41	21.12.2021	UNIT – 6 : Radiation Introduction to the Radiation, its types & applications.	1,2&4	R.K. Shevgaonkar,
42	22.12.2021	Solution for potential function & its equations.	1,2&4	E.C. Jordan & K.G. Balmain,
43	25.12.2021	Basic numericals on for potential function	1,2&4	Narayana Rao, N: Engineering Electromagnetics
44	28.12.2021	Radiation from the Hertz dipole & Power radiated by hertz dipole	1,2&4	David Cheng, "Electromagnetics
45	29.12.2021	Numerical on Hertz dipole & its power radiation.	1,2&4	Sadiku, "Elements of Electromagnetics
46	01.01.2022	Introduction to the basics of Antenna & its types.	1,2&4	Krauss, "Electromagnetics",
47	04.01.2022	Radiation Parameters of antenna, receiving antenna, Monopole and Dipole antenna	1,2&4	W. H. Hayt, "Engineering Electromagnetics
48	05.01.2022	Numerical of radiation parameters of all types of Antenna.	1,2&4	Edminister, Schaum series, "Electromagnetics

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1	18.09.2021	Introduction to the subject & Over all syllabus	1&2	Given University Syllabus
2	21.09.2021	UNIT-1 : Maxwell's Equations Basics of Maxwell's Equation & Vectors,	1,2&4	W. H. Hayt, "Engineering Electromagnetics
3	22.09.2021	Vector calculus	1,2&4	Edminister, Schaum series, "Electromagnetics
4	25.09.2021	Numerical on Vector Calculus.	1,2&4	Sarvate, "Electromagnetism
49	08.01.2022	Revision of entire syllabus.	1,2&4	-
50	11.01.2022	Discussion on Syllabus in exam point of view.	1,2&4	-

Dr. Babasaheb Ambedkar Technological University, Lonere- 402103

P.E.S.College of Engineering, Aurangabad

Department of Electronics and Computer Engineering

Course Coordinator: Vinayak V. Kulkarni

Course Name: Financial Management (FM)

Course Code: Academic Year: BTHM705 (2022)

Semester I / II: I

	Program Educational Objectives(PSO) and Program Specific Outcomes (PSO)	Year : 2021 - 2022 Semester : I / II

Program Educational Objectives (PEO)

PEO 1.	Students will be able to engage in life-long learning and research including supportive and responsible roles on multi-disciplinary tasks.
PEO 2.	Students will acquire, use and develop skills as required for effective professional and societal practices and leadership quality.
PEO 3.	Students will be able to create a new dimension of innovation and entrepreneurship.
PEO 4.	Students will acquire, use and develop skills as required for effective professional and societal practices and leadership quality.

Program Specific Outcomes (PSO)

PSO 1.	Students will be able to understand the impact of engineering problems, solutions in a global and societal context.
PSO 2.	Students will be able to develop confidence for self-education and ability to engage in life-long learning.
PSO 3.	Students will be able to apply knowledge to design a system, component or process to meet desired needs within realistic constraints.
PSO 4.	Students will be able to communicate effectively through verbally, technical writing, reports and presentation.

	Program Outcomes (PO)	Year : 2021 - 2022 Semester : I / II

PROGRAM OUTCOMES: Upon successful completion of this course it is expected that electronics graduate will be able to:

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3.	**Design/ Development of Solutions:**Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** :use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO5.	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an under- standing of the limitations.
PO6.	**The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7.	**Environment and Sustainability:** Understand the impact of professional engineering solutions in soci- etal and environmental contexts and demonstrate knowledge of and need for sustainable develop-ment.
PO8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO9.	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3.	**Design/ Development of Solutions:**Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** :use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO10.	**Communication:** Communicate effectively on complex engineering activities with the engineering com-munity and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO11.	**Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12.	**Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change

	Course Objective and Course Outcomes	Year : 2021 - 2022 Semester : I / II

Course Objective : As part of this course	
1.	To help the students to develop cognizance of the importance of Financial Management in corporate valuation
2.	To enable students to describe how people analyze the corporate leverage under different conditions and understand why people valuate different corporate in different manner
3.	To provide the students to analyze specific characteristics of Supply Chain Industry and their future action for cash flow
4.	To enable students to synthesize related information and evaluate options for most logical and optima l solution such that they would be able to predict and control Debt Equity incurrence and improve results

Course Outcomes : At the end of course, the student will be able to	
CO 1	The students would be able to understand and define basic terminology used in finance and accounts
CO 2	The students would be able to prepare& appraise Financial Statements and evaluate a company in the light of different measurement systems.
CO 3	The students would be able to analyze the risk and return of alternative sources of financing.
CO 4	Estimate cash flows from a project, including operating, net working capital, and capital spending.
CO 5	To estimate the required return on projects of differing risk ,to estimate the cash flows from an investment project, calculate the appropriate discount rate, determine the value added from the project, and make a recommendation to accept or reject the project
CO 6	To describe and illustrate the important elements in project finance Using financial calculator and Excel in a variety of problems

	Mapping of Course Objective and Course Outcomes	Year : 2021 - 2022 Semester : I / II

Mapping of Course Outcomes (COs) with Program Outcomes (POs):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**X**		**X**				**X**			**X**		**X**
CO2		**X**		**X**		**X**			**X**	**X**		**X**
CO3	**X**	**X**		**X**			**X**			**X**		**X**
CO4	**X**				**X**		**X**		**X**		**X**	**X**
CO5			**X**			**X**		**X**			**X**	

Mapping of Course Outcomes (COs) with Program Outcomes (POs):												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	X		X				X			X		X
CO2		X		X		X			X	X		X
CO3	X	X		X			X			X		X
CO6			X		X				X			

Mapping of Course Outcomes (COs) with Program Specific Outcomes (PSO)					
	PO1	PO2	PO3	PO4	PO5
CO1	X	X		X	X
CO2	X		X		X
CO3		X		X	X
CO4		X	X		X
CO5	X				
CO6	X	X		X	X

	Teaching Plan	Year : 2021 - 2022 Semester : I

Bloom Levels: 1. Remember 2.Understand 3. Apply 4.Analysis 5. Create

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1	22.09.2021	Introduction to the subject & Over all syllabus	1,2	University Syllabus
2	23.09.2021	Introduction to Financial Accounting	1,2	Financial Management by Khan & Jain, Text, Problem & Cases, Tata McGraw HillPublication 5 th Edition
3	29.09.2021	Book keeping & Recording: Meaning, Scope and importance of Financial Accounting	1,2	Financial Management by Khan & Jain.
4	30.09.2021	Financial Accounting - concepts and conventions	1,2	Financial Management by Khan & Jain.
5	06.10.2021	classification of accounts, Rules and principles governing Double Entry Book-keeping system	1,2	Financial Management by Khan & Jain.
6	07.10.2021	governing Double Entry Book-keeping system, meaning	2,3	Financial Management by Khan & Jain.
7	13.10.2021	Preparation of Journal, Ledger, Cash book & Trial balance	2,3	Financial Management by Dr. P.C.Tulsian, S Chand Publication 5 th Edition.
8	14.10.2021	Preparation of financial statement and Profit & Loss Account,	3	Financial Management by Dr. P.C.Tulsian.
9	20.10.2021	Preparation Balance Sheet	3	Financial Management by Dr. P.C.Tulsian.
10	18.11.2021	Ratio Analysis - classification of various ratios	3,4	Financial Management by Dr. P.C.Tulsian.
11	24.11.2021	Concept of business finance	3,4	Financial Management by Dr. P.C.Tulsian.
12	25.11.2021	Goals & objectives of financial management	4,5	Financial Management by Dr. P.C.Tulsian.

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1	22.09.2021	Introduction to the subject & Over all syllabus	1,2	University Syllabus
2	23.09.2021	Introduction to Financial Accounting	1,2	Financial Management by Khan & Jain, Text, Problem & Cases, Tata McGraw HillPublication 5 th Edition
3	29.09.2021	Book keeping & Recording: Meaning, Scope and importance of Financial Accounting	1,2	Financial Management by Khan & Jain.
4	30.09.2021	Financial Accounting - concepts and conventions	1,2	Financial Management by Khan & Jain.
13	01.12.2021	Sources of financing, Long Term financing- shares, debentures	4,5	Financial Management by Khan & Jain.
14	02.12.2021	Term loans, lease & hire purchase	2,3,4	Financial Management by Khan & Jain.
15	08.12.2021	Retained earnings, public deposits, bonds	4	Financial Management by Khan & Jain.
16	09.12.2021	Concept of working Capital, significance, types	4	Financial Management by Khan & Jain.
17	15.12.2021	Adequacy of working capital, Factors affecting working capital needs	4	Financial Management by Khan & Jain.
18	16.12.2021	financing approaches for working capital	4	Financial Management by Khan & Jain.
19	22.12.2021	Methods of forecasting working capital requirements, Methods of Forecasting	4,5	Financial Management by Khan & Jain.
20	23.12.2021	Concept of time value of money, Compounding & discounting	4,5	Financial Management by Khan & Jain.
21	29.12.2021	Future value of single amount & annuity, present value of single amount & annuity	5	Financial Management by Khan & Jain.

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1	22.09.2021	Introduction to the subject & Over all syllabus	1,2	University Syllabus
2	23.09.2021	Introduction to Financial Accounting	1,2	Financial Management by Khan & Jain, Text, Problem & Cases, Tata McGraw HillPublication 5 th Edition
3	29.09.2021	Book keeping & Recording: Meaning, Scope and importance of Financial Accounting	1,2	Financial Management by Khan & Jain.
4	30.09.2021	Financial Accounting - concepts and conventions	1,2	Financial Management by Khan & Jain.
22	05.01.2022	Practical application of time value technique.	5	Financial Management by Khan & Jain.
23	06.01.2022	Capital budgeting - Nature and significance	5	Financial Management by Dr. P.C.Tulsian.
24	12.01.2022	Techniques of capital budgeting –Pay Back Method, Accounting rate of return	5	Financial Management by Dr. P.C.Tulsian.
25	13.01.2022	Internal Rate of Return, DCF, Net Present Value and profitability index.	5	Financial Management by Dr. P.C.Tulsian.
26	13.01.2022	Project Financing meaning and details	6	Financial Management by Dr. P.C.Tulsian.
27	15.01.2022	Details of the company, its promoters and project finances required, profitability etc.	6	Financial Management by Dr. P.C.Tulsian.
28	15.01.2022	Loan documentation	6	Financial Management by Dr. P.C.Tulsian.
29	19.01.2022	Appraisal of terms loans by financial institutions	6	Financial Management by Dr. P.C.Tulsian.
30	19.01.2022	Basic components of project finance.	6	Financial Management by Dr. P.C.Tulsian.

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P.E.S.College of Engineering, Aurangabad

Department of Electronics and Computer Engineering

Course Coordinator: S.S. Khedgikar

Course Name: Probability Theory and Random Processes

Course Code: BTBS404

Academic Year: 2021-2022

Semester: II

	Program Educational Objectives(PEO) and Program Specific Outcomes (PSO)	Year : 20 - 20 Semester : I / II

Program Educational Objectives (PEO)

1	To equip graduates with a strong foundation in engineering sciences and Electronics & Telecommunication Engineering fundamentals to become effective collaborators, researchers and real-time problem solver with technical competencies.
2	Perceive the limitation and impact of engineering solutions in social, legal, environmental, economical and multidisciplinary contexts
3	Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting global competitiveness

Program Specific Outcomes (PSO)

1	Apply basic knowledge related to Electronic Circuits, Embedded & wireless communication Systems and Signal Processing to solve engineering/ societal problems in the field of Electronics and Telecommunication Engineering
2	Recognize and adapt to technical developments and to engage in lifelong learning and develop consciousness for professional, social, legal and ethical responsibilities.
3	Excellent adaptability to the changing industrial and real world requirements

	Program Outcomes (PO)	Year : 20 - 20 Semester : I / II

PROGRAM OUTCOMES: Upon successful completion of this course it is expected that electronics graduate will be able to:

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3.	**Design/ Development of Solutions:**Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** :use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO5.	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an under- standing of the limitations.
PO6.	**The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7.	**Environment and Sustainability:** Understand the impact of professional engineering solutions in soci- etal and environmental contexts and demonstrate knowledge of and need for sustainable develop-ment.
PO8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO9.	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10.	**Communication:** Communicate effectively on complex engineering activities with the engineering com-munity and with society at large, such as being able to comprehend and write

	effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO11.	**Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12.	**Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change

	Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Course Objective : As part of this course, Students	
1.	To develop basic of probability and random variables
2.	The primary objective of this course is to provide mathematical background and sufficient experience
3.	student can read, write, and understand sentences in the language of probability theory
4.	solve probabilistic problems in engineering and applied science.
5.	
6.	

Course Outcomes : At the end of course, the student will be able to	
CO 1	Understand representation of random signals
CO 2	Investigate characteristics of random processes
CO 3	Make use of theorems related to random signals
CO 4	To understand propagation of random signals in LTI systems
CO 5	
CO 6	

	Mapping of Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Mapping of Course Outcomes (COs) with Program Outcomes (POs):

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12
CO 1						✔			✔			
CO 2		✔										✔
CO 3					✔					✔		
CO 4	✔		✔								✔	
CO 5												
CO 6												
CO 7												

Mapping of Course Outcomes (COs) with Program Specific Outcomes (PSO)

	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	✔				
CO2			✔		
CO3		✔			
CO4		✔			
CO5					
CO6					

	Teaching Plan	Year : 20 - 20 Semester : I / II

Bloom Levels: 1. Remember 2.Understand 3. Apply 4.Analysis 5. Create

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. _____ to _____
1	28-3-2022	Introduction to Probability: Definitions, Scope and History	1-1	T. Veerrajan, “Probability, Statistics and Random Processes”, Third Edition, McGraw Hill.
2	29-3-2022	limitation of classical and relative-frequency-based definitions	1-2	Probability and Random Processes by Geoffrey Grimmett, DavidStirzaker
3	31-3-2022	Sets, fields, sample space and events	1-2	``Probability and Random Processes with Applications to Signal Processing," Third Edition, PearsonEducation
4	4-4-2022	axiomatic definition of probability, Combinatorics: Probability on finite sample spaces	1-2	Probability, random processes, and estimation theory for engineers by Henry Stark, John WilliamWoods.
5	5-4-2022	Joint and conditional probabilities	2-2	Introduction to Probability Theory with Stochastic Processes, Springer International
6	7-4-2022	independence, total probability	2-3	“Probability, Random Variables and Stochastic Processes," Fourth Edition, McGrawHill.
7	11-4-2022	independence, total probability	2-3	Probability and Random Processes by Geoffrey Grimmett, DavidStirzaker

8	12-4-2022	Definition of random variables, continuous and discrete random variables,	1-1	T. Veerrajan, “Probability, Statistics and Random Processes”, Third Edition, McGraw Hill.
9	18-4-2022	cumulative distribution function (cdf) for discrete and continuous random variables	1-2	Introduction to Probability, UBSPublishers
10	19-4-2022	probability density functions (pdf) and properties	1-2	Probability, random processes, and estimation theory for engineers by Henry Stark, John WilliamWoods.
11	21-4-2022	Jointly distributed random variables, conditional and joint density and distribution functions,	1-2	Introduction to Probability Theory with Stochastic Processes, Springer International
12	25-4-2022	Function of one random variable, pdf of the function of one random variable	1-3	``Probability and Random Processes with Applications to Signal Processing," Third Edition, PearsonEducation
13	26-4-2022	Function of two random variables; Sum of two independent random variables	3-3	Probability and Random Processes by Geoffrey Grimmett, DavidStirzaker
14	28-4-2022	Expectation: mean, variance and moments of a random variable	3-3	T. Veerrajan, “Probability, Statistics and Random Processes”, Third Edition, McGraw Hill.
15	2-5-2022	conditional expectation; covariance and correlation;independent	3-4	Introduction to Stochastic Models, Harcourt Asia, AcademicPress.
16	3-5-2022	Random vector: mean vector, covariance matrix and properties	3-4	“Probability, Random Variables and Stochastic Processes," Fourth Edition, McGrawHill.
17	5-5-2022	Some special distributions: Uniform, Gaussian and Rayleigh distributions	2-1	Introduction to Probability, UBSPublishers
18	9-5-2022	Binomial, and Poisson distributions; MultivariateGaussiandistribution	2-1	Probability, random processes, and estimation theory for engineers by Henry Stark, John WilliamWoods.

19	10-5-2022	Vector-spacerepresentationofrandomvariables,linear independence, inner product	2-3	Introduction to Stochastic Models, Harcourt Asia, AcademicPress.
20	12-5-2022	Schwarz Inequality, Moment-generating functions, Bounds and approximations	2-4	``Probability and Random Processes with Applications to Signal Processing," Third Edition, PearsonEducation
21	16-5-2022	Tchebysheff inequality and Chernoff Bound	2-4	Introduction to Probability Theory with Stochastic Processes, Springer International
22	17-5-2022	Almost sure convergence and strong law of large numbers	2-4	Probability, random processes, and estimation theory for engineers by Henry Stark, John WilliamWoods.
23	19-5-2022	convergence in mean square sense with examples from parameter estimation	2-5	Introduction to Probability, UBSPublishers
24	23-6-2022	convergence in probability with examples; convergence in distribution	2-5	Probability and Random Processes by Geoffrey Grimmett, DavidStirzaker
25	24-5-2022	Central limit theorem and its significance	1-1	T. Veerrajan, “Probability, Statistics and Random Processes”, Third Edition, McGraw Hill.
26	26-5-2022	Random process: Probabilistic structure of a random process; mean, autocorrelation and auto - covariance functions	1-2	“Probability, Random Variables and Stochastic Processes," Fourth Edition, McGrawHill.
27	30-5-2022	Stationarity: strict - sense stationary (SSS) and wide- sense stationary (WSS) processes	2-2	Introduction to Probability Theory with Stochastic Processes, Springer International
28	31-5-2022	Autocorrelation function of a real WSS process and its properties, cross- correlation function	2-2	Probability and Random Processes by Geoffrey Grimmett, DavidStirzaker
29	2=6=2022	Ergodicity and its importance, Power spectral density, properties of power spectral density	2-3	Probability, random processes, and estimation theory for engineers by Henry Stark, John WilliamWoods.

30	6-6-2022	cross- power spectral density and properties; auto-correlation function and power spectral density of a WSS random sequence,	3-3	T. Veerrajan, “Probability, Statistics and Random Processes”, Third Edition, McGraw Hill.
31	7-6-2022	examples with white - noise as input; Examples of random processes: white noise process and white noise sequence;	3-4	“Probability, Random Variables and Stochastic Processes," Fourth Edition, McGrawHill.
32	9-6-2022	Gaussian process; Poisson process, Markov Process	4-5	``Probability and Random Processes with Applications to Signal Processing," Third Edition, PearsonEducation

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P.E.S.College of Engineering, Aurangabad

Department of Electronics and Computer Engineering

Course Coordinator :Prof.V.R Kshirsagar

Course Name : Signals and Systems

Course Code :BTETC402

Academic Year : 2021-2022

Semester I / II : II

	Program Educational Objectives(PEO) and Program Specific Outcomes (PSO)	Year : 20 - 20 Semester : I / II

Program Educational Objectives (PEO)

1	To equip graduates with a strong foundation in engineering sciences and Electronics & Telecommunication Engineering fundamentals to become effective collaborators, researchers and real-time problem solver with technical competencies.
2	Perceive the limitation and impact of engineering solutions in social, legal, environmental, economical and multidisciplinary contexts
3	Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting global competitiveness.

Program Specific Outcomes (PSO)

1	Apply basic knowledge related to Signal Processing to solve engineering/ societal problems in the field of Electronics and Telecommunication Engineering.
2	Recognize and adapt to technical developments and to engage in lifelong learning and develop consciousness for professional, social, legal and ethical responsibilities.
3	Excellent adaptability to the changing industrial and real world requirements

	Program Outcomes (PO)	Year : 20 - 20 Semester : I / II

PROGRAM OUTCOMES: Upon successful completion of this course it is expected that electronics graduate will be able to:

	Program Outcome
PO1.	**Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3.	**Design/ Development of Solutions:**Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
PO4.	**Conduct investigations of complex problems** :use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
PO5.	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an under- standing of the limitations.
PO6.	**The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
PO7.	**Environment and Sustainability:** Understand the impact of professional engineering solutions in soci- etal and environmental contexts and demonstrate knowledge of and need for sustainable develop-ment.
PO8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO9.	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10.	**Communication:** Communicate effectively on complex engineering activities with the engineering com-munity and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO11.	**Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12.	**Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change

	Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Course Objective : As part of this course, Students	
1.	To understand the mathematical description of continuous and discrete time signals and systems.
2.	To classify signals into different categories
3.	To analyze Linear Time Invariant (LTI) systems in time and transform domains.
4.	To build basics for understanding of courses such as signal processing, control system and communication.

Course Outcomes : At the end of course, the student will be able to	
CO1	Understand mathematical description and representation of continuous and discrete time signals and systems
CO2	Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system.
CO3	Understand and resolve the signals in frequency domain using Fourier series and Fourier transforms.
CO4	Understand the limitations of Fourier transform and need for Laplace transform and develop the ability to analyze the system in s-domain.

	Mapping of Course Objective and Course Outcomes	Year : 20 - 20 Semester : I / II

Mapping of Course Outcomes (COs) with Program Outcomes (POs):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	YES	YES	YES									YES
CO2	YES		YES		YES			YES			YES	
CO3	YES	YES				YES						YES
CO4	YES	YES	YES	YES		YES						YES

Mapping of Course Outcomes (COs) with Program Specific Outcomes (PSO)

	PO1	PO2	PO3	PO4	PO5
CO1	YES				
CO2	YES	YES			
CO3	YES	YES	YES		

	Teaching Plan	Year : 20 - 20 Semester : I / II

Bloom Levels: 1. Remember 2.Understand 3. Apply 4.Analysis 5. Create

No. of Lecture	Date	Topic / Sub - Topic	Course Outcome No. and Bloom Level	Refer (Text Book, Website) Page no. ____ to ____
1		Introduction and Classification of signals: Definition of signal and systems, Continuous time and discrete time signal	**1,1&2**	Dr.Sanjay Sharma,Signals & Systems
2		Classification of signals as even, odd, periodic and non-periodic,Problems	**1,1,2&3**	—--do—--
3		deterministic and non-deterministic, energy and power, Problems	**1,1,2&3**	—--do—--
4		elementary signals used for testing: exponential, sine, impulse, step and its properties, ramp, rectangular, triangular, signum, sinc	**1,1&2**	—--do—--
5		Operations on signals: Amplitude scaling, addition, multiplication, differentiation, integration (Accumulator for DT), time scaling, time shifting and time folding,	**1,1,2&3**	—--do—--
6		Sampling Theorem and reconstruction of sampled signal, Concept of aliasing, examples on under sampled and over sampledsignals.	**1,1&2**	—--do—--
7		Systems: Definition, Classification: linear and non-linear, time variant and invariant, causal and non-causal, static and dynamic, stable and unstable, invertible.	**1,1,2&3**	—--do—--
8		System modeling: Input-output relation,	**2,1&2**	J.S Katre,Signals & Systems
9		definition of impulse response,	**2,1&2**	—--do—--
10		convolution integral,	**2,1&2**	—--do—--
11		computation of convolution integral using graphical method	**2,1,2&3**	—--do—--
12		Computation of convolution sum.	**2,1,2&3**	—--do—--

13		Properties of convolution	**2,1&2**	—--do—--
14		properties of the system based on impulse response, step response in terms of impulse response	**2,1&2**	—--do—--
15		Fourier series (FS) representation of periodic Continuous Time (CT) signals,,	**3,1&2**	—--do—--
16		Dirichlet condition for existence of Fourier series	**3,1&2**	—--do—--
17		FS representation of CT signals using exponential Fourier series,	**3,1,2&#**	—--do—--
18		Fourier spectrum representation	**3,1&2**	—--do—--
19		properties of Fourier series,	**3,1&2**	—--do—--
20		Gibbs phenomenon,Discrete Time Fourier Series	**3,1&2**	—--do—--
21		Discrete Time Fourier series Properties	**3,1&2**	—--do—--
22		Fourier Transform (FT) representation of aperiodic CT signals, Dirichlet condition for existence of Fourier transform,	**3,1&2**	—--do—--
23		evaluation of magnitude and phase response,,	**3,1&2**	—--do—--
24		FT of standard CT signals, FT of standard periodic CT signals	**3,1&2**	—--do—--
25		Introduction to Fourier Transform of DT signals,	**3,1&2**	—--do—--
26		Properties of CTFT and DTFT,	**3,1&2**	—--do—--
27		Fourier Transform of periodic signals.	**3,1&2**	—--do—--
28		Concept of sampling and reconstruction in frequency domain, sampling of bandpass signal	**3,1&2**	—--do—--
29		Definition of Laplace Transform (LT), Limitations of Fourier transform and need of Laplace transform, ROC and its properties,	**4,1&2**	—--do—--
30		properties of Laplace transform, Laplace transform evaluation using properties,	**4,1&2**	—--do—--
31		Inverse Laplace transform based on partial fraction expansion,	**4,1&2**	—--do—--
32		Application of Laplace transforms to the LTI systemanalysis.	**4,1&2**	—--do—--
33		Introduction to Z-transform, and its properties,	**4,1&2**	—--do—--

34		Inverse Z-transform, different methods of inverse Z-transform,	**4,1&2**	—--do—--
35		Z-transform for discrete time system LTI analysis.	**4,1&2**	—--do—--

SY-CSE (2021-22)
RESULT ANALYSIS
4th SEMISTER

Sr. No.	Full Name	SGPA	CGPA	%	Result
1	ZORE AAKASH GAJANAN				FAIL
2	GUJJARWAR AARTI RAJU	6.7	8.6	81	PASS
3	WAGH ABHIJEET BHASKAR				FAIL
4	KAMBLE ABHIJEET SHRAVAN	6.96	8.44	79.4	PASS
5	NATH ADITYA KUMAR SURENEDRA	6.61	8.5	80	PASS
6	MANDVE AMEYA MOHAN	5.65	8.31	78.1	PASS
7	SONAWANE ANIKET KAILAS				FAIL
8	KARHALE ASHISH HARI	6.78			PASS
9	BANKAR BHAGWAT SHRIDHAR	6.26	7.58	70.8	PASS
10	JADHAV BUDDHABHUSHAN PRABHAKAR				FAIL
11	SYED DANISH ALI TAUFEEQ ALI				FAIL
12	KHAN DANISH MINHAJ				FAIL
13	RAGHU DIPAK CHHAGAN				FAIL
14	FAIZ KHAN FEROZ KHAN	7	8.65	81.5	PASS
15	KHAN FARHAN NASIR				FAIL
16	AAGALE GAURAV SUBHASH	5.83	7.88	73.8	PASS
17	SONAWANE GAURAV RAVINDRA	6.87	8.6	81	PASS
18	GHUMRE HARSHADA DNYANESHWAR	7.22	8.6	81	PASS
19	GANGADHAR HRITIK SANJAY	8.04	8.77	82.7	PASS
20	JAGDALE JAGANNATH KASHINATH				FAIL
21	GAIKWAD KALLYANI SANJAY	6.3	8.25	77.5	PASS
22	KHAN ATIF KHAN SAMI	6.09	8.2	77	PASS
23	JADHAV KUNAL KAILASH				FAIL
24	SAYYAD MOBIN AYYUB				FAIL
25	MOHAMMED KHIZER MOHAMMED FEROZ	6.52	8.35	78.5	PASS
26	FAROOQUI MOHAMMED QURRAM MOHAMMED	6	8.27	77.7	PASS
27	CHISHTY MOHD AFRAZUDDIN MOHD ANWARUI	6	8.04	75.4	PASS
28	VHARE OM SANTRAM	6.3	8.19	76.9	PASS
29	SADAWARTE PALLAVI SANJAY	5.96	7.76	72.6	PASS
30	MUGDAL PRADNYA BHIMRAO	5.91	7.71	72.1	PASS
31	GOSAVI PRAFULL VILASPURI	7.65	8.81	83.1	PASS
32	PANDAGALE PRASENJEET TRYAMBAK	6.65	8.25	77.5	PASS
33	TUPARE PRATIKSHA RAMESH	6.04	7.7	72	PASS
34	WAGHMARE PRIYANSHU VIJAY	5.65	7.73	72.3	PASS
35	QUADRI SYED UZAIF SYED SALEEM	6.04	7.95	74.5	PASS
36	CHAVAN ROHIT RAJESH	6.04	7.85	73.5	PASS
37	TUPE RUSHIKESH PARASRAM	6.61	8.01	75.1	PASS
38	BINAFIF SAAD RUBAIYA	6.13	8.02	75.2	PASS
39	SALVE SAKSHI RAMAKANT	6.13	8.13	76.3	PASS
40	PATIL SANKET SURESH				FAIL
41	PATANKAR SAPNA BHAGAWANRAO	6.04	7.96	74.6	PASS
42	RATHOD SARIKA GOVIND				FAIL
43	SHAIKH MOHAMAD ARSHIYAN MOHAMAD ANSARI				FAIL

44	SHAIKH ZIA AHMED JALIL AHMED				FAIL
45	RAJGURU SIDDHANT ASHOK	5.48			PASS
46	SAKHARE SUDARSHAN RAGHU	6.22	7.71	72.1	PASS
47	SHINDE SURAJ KASHINATH	6.13	8.01	75.1	PASS
48	SARDAR SURAJKUMAR ANILKUMAR				FAIL
49	SADAWARTE SURBHI JITENDRA	6.39	7.99	74.9	PASS
50	PATHARE TANMAY BABASAHEB				FAIL
51	JAYBHAYE TEJAS ARUN				FAIL
52	KANKAL TEJAS RAJENDRA				FAIL
53	ANSARI UZAIR AHMAD ANSARI ABDUL				FAIL
54	JAGTAP VAIBHAV KAILAS				FAIL
55	BODKHE VIKAS SHIVAJI	6.61	8.15	76.5	PASS
56	KADU VISHAL MANOHARAO				FAIL
57	WAGH YASH DEEPAK	6.09	8.06	75.6	PASS
58	KHILLARE YASH EKNATH				FAIL
59	AUTI YASH ANANTRAO	6.83	8.35	78.5	PASS
60	ANKUSH YASH SURESH				FAIL
61	BAMNAWAT YOGITA RAMDHAN	6.48	8.13	76.3	PASS
62	SHAIKH ZAID SHAIKH SAYEED	6.96	8.26	77.6	PASS
63	SHAHAPURKAR AADESH ANIL				FAIL
64	CHATSE NIKITA BABURAO	7.74	8.9	84	PASS
65	LANDGE NAGSEN SUNIL	5.87	7.7	72	PASS
66	NARWADE VAISHALI DADASAHEB	6.52	7.02	65.2	PASS
67	WAGHMARE KANCHAN DHONDIBA	6.61	7.81	73.1	PASS
68	NITURE VISHAL MALLIKARJUN	5.96	7.23	67.3	PASS
69	BHARTI VINOD KUNJBIHARI				FAIL
70	HALNOR SAYLEE SHANKAR				FAIL
71	KHARAT DHAMMADEEP KAILAS				FAIL
72	SAYYED SAMEER SAYYED SHAKER	6.43	7.6	71	PASS
73	WANKHADE KUNAL SAHEBRAO				FAIL
74	MUGDAL ROHAN MADHUKAR				FAIL
75	GAIKWAD RUTUJA DAYANAND				FAIL
76	QUAZI ALINA AYESHA QUAZI HYDER MOHIUDI	6.74	7.79	72.9	PASS
77	TANDALE SUPRIYA SANTOSH	6.65	7.66	71.6	PASS
78	HASHMI AMMAR IRSHAD				FAIL
79	KHURDE SHRUTIKA VILAS				FAIL
80	SATHE JAY KAILAS	5.87	7.04	65.4	PASS
81	PATIL POOJA SUKALAL	6.78	7.45	69.5	PASS
82	PATIL SHOURESH SHIVAJI				FAIL
83	INAMDAR ALTAMASH AFJAL				FAIL
84	CHAUDANTE VAISHNAVI BHIMRAO	6.39	7.64	71.4	PASS
85	KAMBLE TEJASWI ARVIND				FAIL
86	SURUSHE CHAITALI MINESH	7.17	7.87	73.7	PASS
87	TATHE SAKSHI RAVINDRA	6.83	7.62	71.2	PASS
88	TATHE SEJAL RAVINDRA	7.26	7.83	73.3	PASS
89	SARDAR AJINKYA MANOHAR				FAIL
90	PATIL ABHISHEK JAIDEEP				FAIL
91	INGALE KANCHAN SURYAKANT	7.13	7.83	73.3	PASS
92	HARNE RUSHIKESH VITTHALRAO	6.74	7.7	72	PASS
93	KHAIRE RUPALI BHAUSAHEB	6.04	7.23	67.3	PASS

94	PAWAR BHAKTI PANDIT				
95	GANRAJ POOJA ANNASAHEB				
96	VAIJWADE VAISHNAVI NARAYAN				
97	KARALE RAJASAB MADHAV				
98	SHIRGIRE SHRINIVAS SHIVAJIRAO				
99	DHIWAR PRATIKSHA MARKAN				
100	MD FAIZAN BASRAVI AMAR BASRAVI				
101	MATE ROHIT MILIND				
102	HANFI SAIF ASLAM				
103	SIDDIQUI MOHTASHIM AZZAM SIDDIQUI MOHD SALAHUDDIN				
104	KARDILE OMKAR ANIL				
105	MOHAMMED SAAD MOHAMMED WAJEED				
106	RAJPUT KIRAN GULABSINGH				
107	SAWANT SAYALI GHANSHYAM				
108	SHEJUL GAURI ASHOK				
109	VIJAPURE KESHAV MAROTI				

Total Result :

Appeared	109	100%
Pass	62	56.90%
total fail	47	43.10%
Pass Class	0	0%
Second Class	0	0%
First Class	6	5.50%
Distinction	54	49.54%

subjectwise result analysis :

subject	Pass	Pass %	fail	fail%	Pass Class	Pass Class %	Second Class	Second Class %	First Class	First Class %	Distinction	Distinction %
DAA	102	93.58%	7	6.40%	20	18.34%	20	18.34%	40	36.68%	22	20.18%
OS	96	88.07%	13	11.92%	48	44.03%	13	11.92%	28	25.68%	6	5.50%
HR	108	99.08%	1	0.90%	20	18.34%	14	12.84%	51	46.79%	23	21.10%
PT&R	87	79.81%	22	20.18%	47	43.11%	13	11.92%	24	22.01%	3	1.57%
DLD	68	62.38%	41	37.61%	47	43.11%	10	9.17%	11	10.09%	0	0%
OS&PYTH	109	100%	0	0%	5	4.58%	2	1.83%	25	22.93%	77	70.64%
SEMINAR-	105	96.33%	4	3.67%	0	0%	0	0%	13	11.92%	92	84.40%

Class Teacher
Prof. B.S.Pawar

H.O.D.
Dr. V. B. Kamble

SY-CSE (2021-22)
RESULT ANALYSIS
3rd SEMISTER

Sr. No.	Enrollment Number	Full Name	SGPA	CGPA	%	Result
1	PRN:T2021341242001	ZORE AAKASH GAJANAN	8.29	8.62	81.2	PASS
2	PRN:T2021341242002	GUJJARWAR AARTI RAJU	9	9.33	88.3	PASS
3	PRN:T2021341242003	WAGH ABHIJEET BHASKAR	8.83	9.18	86.8	PASS
4	PRN:T2021341242004	KAMBLE ABHIJEET SHRAVAN	8.54	9	85	PASS
5	PRN:T2021341242005	NATH ADITYA KUMAR SURENEDRA	9	9.23	87.3	PASS
6	PRN:T2021341242007	MANDVE AMEYA MOHAN	9.04	9.33	88.3	PASS
7	PRN:T2021341242008	SONAWANE ANIKET KAILAS	8.17	8.66	81.6	PASS
8	PRN:T2021341242009	KARHALE ASHISH HARI	8.21			Fail
9	PRN:T2021341242010	BANKAR BHAGWAT SHRIDHAR	7.33	8.08	75.8	PASS
10	PRN:T2021341242011	JADHAV BUDDHABHUSHAN PRABHAKAR				Fail
11	PRN:T2021341242012	SYED DANISH ALI TAUFEEQ ALI	8.54	8.77	82.7	PASS
12	PRN:T2021341242013	KHAN DANISH MINHAJ	8.29	8.77	82.7	PASS
13	PRN:T2021341242015	RAGHU DIPAK CHHAGAN	8.54	8.84	83.4	PASS
14	PRN:T2021341242016	FAIZ KHAN FEROZ KHAN	9	9.28	87.8	PASS
15	PRN:T2021341242017	KHAN FARHAN NASIR	8.13	8.98	84.8	PASS
16	PRN:T2021341242018	AAGALE GAURAV SUBHASH	8	8.66	81.6	PASS
17	PRN:T2021341242019	SONAWANE GAURAV RAVINDRA	8.83	9.25	87.5	PASS
18	PRN:T2021341242022	GHUMRE HARSHADA DNYANESHWAR	8.63	9.11	86.1	PASS
19	PRN:T2021341242023	GANGADHAR HRITIK SANJAY	8.54	9.05	85.5	PASS
20	PRN:T2021341242024	JAGDALE JAGANNATH KASHINATH	8.46	8.77	82.7	PASS
21	PRN:T2021341242025	GAIKWAD KALLYANI SANJAY	8.38	9	85	PASS
22	PRN:T2021341242026	KHAN ATIF KHAN SAMI	8.83	9	85	PASS
23	PRN:T2021341242027	JADHAV KUNAL KAILASH	7.88	8.16	76.6	PASS
24	PRN:T2021341242028	SAYYAD MOBIN AYYUB	8.21	8.61	81.1	PASS
25	PRN:T2021341242029	MOHAMMED KHIZER MOHAMMED FEROZ	8.71	9.03	85.3	PASS
26	PRN:T2021341242030	FAROOQUI MOHAMMED QURRAM MOHAMMED IFTEQ	8.63	9.15	86.5	PASS
27	PRN:T2021341242031	CHISHTY MOHD AFRAZUDDIN MOHD ANWARUDDIN	8.29	8.8	83	PASS
28	PRN:T2021341242033	VHARE OM SANTRAM	8.25	8.92	84.2	PASS
29	PRN:T2021341242034	SADAWARTE PALLAVI SANJAY	7.71	8.44	79.4	PASS
30	PRN:T2021341242035	MUGDAL PRADNYA BHIMRAO	7.71	8.41	79.1	PASS
31	PRN:T2021341242036	GOSAVI PRAFULL VILASPURI	9	9.25	87.5	PASS
32	PRN:T2021341242037	PANDAGALE PRASENJEET TRYAMBAK	8.13	8.87	83.7	PASS
33	PRN:T2021341242038	TUPARE PRATIKSHA RAMESH	8.25	8.33	78.3	PASS
34	PRN:T2021341242039	WAGHMARE PRIYANSHU VIJAY	8.46	8.51	80.1	PASS
35	PRN:T2021341242040	QUADRI SYED UZAIF SYED SALEEM	7.92	8.67	81.7	PASS
36	PRN:T2021341242042	CHAVAN ROHIT RAJESH	8.58	8.52	80.2	PASS
37	PRN:T2021341242043	TUPE RUSHIKESH PARASRAM	8.42	8.54	80.4	PASS
38	PRN:T2021341242044	BINAFIF SAAD RUBAIYA	8.46	8.74	82.4	PASS
39	PRN:T2021341242045	SALVE SAKSHI RAMAKANT	8.54	8.89	83.9	PASS
40	PRN:T2021341242046	PATIL SANKET SURESH	8.33	8.51	80.1	PASS
41	PRN:T2021341242047	PATANKAR SAPNA BHAGAWANRAO	8.42	8.69	81.9	PASS
43	PRN:T2021341242049	SHAIKH MOHAMAD ARSHIYAN MOHAMAD ANSARI	8.79	8.66	81.6	PASS
44	PRN:T2021341242050	SHAIKH ZIA AHMED JALIL AHMED	7.71	8.1	76	PASS
45	PRN:T2021341242052	RAJGURU SIDDHANT ASHOK	8.17			Fail
46	PRN:T2021341242053	SAKHARE SUDARSHAN RAGHU	7.92	8.28	77.8	PASS
47	PRN:T2021341242054	SHINDE SURAJ KASHINATH	8.42	8.72	82.2	PASS
49	PRN:T2021341242056	SADAWARTE SURBHI JITENDRA	7.96	8.59	80.9	PASS
50	PRN:T2021341242057	PATHARE TANMAY BABASAHEB	8.38	8.57	80.7	PASS
51	PRN:T2021341242058	JAYBHAYE TEJAS ARUN	8.96	9.03	85.3	PASS
52	PRN:T2021341242059	KANKAL TEJAS RAJENDRA	8.88	8.92	84.2	PASS
53	PRN:T2021341242060	ANSARI UZAIR AHMAD ANSARI ABDUL	8.38	8.84	83.4	PASS
54	PRN:T2021341242061	JAGTAP VAIBHAV KAILAS	9.04	9.07	85.7	PASS
55	PRN:T2021341242062	BODKHE VIKAS SHIVAJI	8.21	8.74	82.4	PASS
56	PRN:T2021341242063	KADU VISHAL MANOHARAO	8.04	8.85	83.5	PASS
57	PRN:T2021341242064	WAGH YASH DEEPAK	8.38	8.8	83	PASS
58	PRN:T2021341242065	KHILLARE YASH EKNATH	8.25	8.9	84	PASS
59	PRN:T2021341242066	AUTI YASH ANANTRAO	8.71	8.92	84.2	PASS
60	PRN:T2021341242067	ANKUSH YASH SURESH	8.5	8.8	83	PASS

61	PRN:T2021341242068	BAMNAWAT YOGITA RAMDHAN	8.75	8.75	82.5	PASS
62	PRN:T2021341242069	SHAIKH ZAID SHAIKH SAYEED	8.38	8.77	82.7	PASS
63	PRN:T2021341242070	SHAHAPURKAR AADESH ANIL	7.96	8.3	78	PASS
64	PRN:T2021341293007	CHATSE NIKITA BABURAO	9.04	9.34	88.4	PASS
65	PRN:T2021341372002	LANDGE NAGSEN SUNIL	7.96	8.39	78.9	PASS
67	PRN:T2121341242502	WAGHMARE KANCHAN DHONDIBA	8.96	8.96	84.6	PASS
68	PRN:T2121341242503	NITURE VISHAL MALLIKARJUN	8.46	8.49	79.9	PASS
71	PRN:T2121341242506	KHARAT DHAMMADEEP KAILAS	9.21	9.21	87.1	PASS
72	PRN:T2121341242507	SAYYED SAMEER SAYYED SHAKER	8.71	8.71	82.1	PASS
73	PRN:T2121341242508	WANKHADE KUNAL SAHEBRAO	8.54	8.54	80.4	PASS
75	PRN:T2121341242510	GAIKWAD RUTUJA DAYANAND	8.29	8.29	77.9	PASS
76	PRN:T2121341242511	QUAZI ALINA AYESHA QUAZI HYDER MOHIUDDIN	8.79	8.79	82.9	PASS
77	PRN:T2121341242512	TANDALE SUPRIYA SANTOSH	8.63	8.63	81.3	PASS
79	PRN:T2121341242514	KHURDE SHRUTIKA VILAS	8.21	8.21	77.1	PASS
80	PRN:T2121341242515	SATHE JAY KAILAS	8.17	8.17	76.7	PASS
81	PRN:T2121341242516	PATIL POOJA SUKALAL	8.08	8.08	75.8	PASS
82	PRN:T2121341242517	PATIL SHOURESH SHIVAJI	8.21	8.21	77.1	PASS
83	PRN:T2121341242518	INAMDAR ALTAMASH AFJAL	9.08	9.08	85.8	PASS
84	PRN:T2121341242519	CHAUDANTE VAISHNAVI BHIMRAO	8.83	8.83	83.3	PASS
85	PRN:T2121341242520	KAMBLE TEJASWI ARVIND	8.46	8.46	79.6	PASS
86	PRN:T2121341242521	SURUSHE CHAITALI MINESH	8.54	8.54	80.4	PASS
87	PRN:T2121341242522	TATHE SAKSHI RAVINDRA	8.38	8.38	78.8	PASS
88	PRN:T2121341242523	TATHE SEJAL RAVINDRA	8.38	8.38	78.8	PASS
89	PRN:T2121341242524	SARDAR AJINKYA MANOHAR	8.71	8.71	82.1	PASS
90	PRN:T2121341242525	PATIL ABHISHEK JAIDEEP	8.75	8.75	82.5	PASS
91	PRN:T2121341242526	INGALE KANCHAN SURYAKANT	8.5	8.5	80	PASS
92	PRN:T2121341242527	HARNE RUSHIKESH VITTHALRAO	8.63	8.63	81.3	PASS
93	PRN:T2121341242528	KHAIRE RUPALI BHAUSAHEB	8.38	8.38	78.8	PASS
94	PRN:T2121341242529	PAWAR BHAKTI PANDIT	8.79	8.79	82.9	PASS
95	PRN:T2121341242530	GANRAJ POOJA ANNASAHEB	8.71	8.71	82.1	PASS
96	PRN:T2121341242531	VAIJWADE VAISHNAVI NARAYAN	8.29	8.29	77.9	PASS
97	PRN:T2121341242532	KARALE RAJASAB MADHAV	8.38	8.38	78.8	PASS
98	PRN:T2121341242533	SHIRGIRE SHRINIVAS SHIVAJIRAO	8.54	8.54	80.4	PASS
99	PRN:T2121341242534	DHIWAR PRATIKSHA MARKAS	8.46	8.46	79.6	PASS
101	PRN:T2121341242536	MATE ROHIT MILIND	8.17	8.17	76.7	PASS
102	PRN:T2121341242537	HANFI SAIF ASLAM	8.83	8.83	83.3	PASS
103	PRN:T2121341242538	SIDDIQUI MOHTASHIM AZZAM SIDDIQUI MOHD SALAHU	8.54	8.54	80.4	PASS
104	PRN:T2121341242539	KARDILE OMKAR ANIL	8.38	8.38	78.8	PASS
105	PRN:T2121341242540	MOHAMMED SAAD MOHAMMED WAJEED				Fail
106	PRN:T2121341242542	RAJPUT KIRAN GULABSINGH	8.54	8.54	80.4	PASS
108	PRN:T2121341242544	SHEJUL GAURI ASHOK	8.5	8.5	80	PASS
110	PRN:T2121341242541	RAGDE RAHUL PRABHAKAR				Fail

Subjectwise Result Analysis:

Subject	pass	pass%	fail	fail%	Pass Class	Pass Class%	Second Class	Second Class%	First Class	First Class%	Distinction	Distinction%
MATH-III	109	99.09%	1	0.09%	4	3.63%	4	3.63%	41	37.27%	60	54.54%
DMS	109	99.09%	1	0.09%	0	0%	2	1.81%	1	0.09%	106	96.36%
DS	109	99.09%	1	0.09%	3	2.70%	2	1.81%	48	43.63%	56	50.90%
CAO	109	99.09%	1	0.09%	0	0%	0	0%	3	2.70%	106	96.36%
OOPJ	107	97.27%	3	2.70%	0	0%	1	0.09%	3	2.70%	103	93.63%
DS&OOPJ	109	99.09%	1	0.09%	0	0%	0	0%	34	30.90%	75	68.18%
SEMINAR-I	109	99.09%	1	0.09%	0	0%	0	0%	76	69.09%	33	30.00%
INTERNSHIP	110	100%	0	0%	0	0%	11	10%	35	31.81%	64	58.18%

Total Result:

Appeared	110	100%
Pass	105	95.45%
Total Fail	5	4.54%
Pass Class	0	0%
Second Class	0	0%
First Class	10	9.09%
Distinction	95	86.36%

Class Teacher
Prof. B.S.Pawar

H.O.D
Prof. V. B. Kamble

P.E.S College Of Engineering, Aurangabad
Department Of Computer Science & Engineering
BTECH FINAL YEAR CSE AY-2020-21
SEM VII Result Analysis

SR. NO.	PRN	NAME	SGPA	CGPA	RESULT
1	PRN:1921341242011	GANDHI SHARON SUNIL	9.30	8.38	PASS
2	PRN:1921341242012	GODESWAR APURVA ANIL	8.65	8.26	PASS
3	PRN:1921341242015	KHAN MOHAMMED SOHAIL	9.30	8.31	PASS
4	PRN:1921341242016	SHAIKH FURKHAN SHAIKH FAROOQ AHMED	9.15	8.02	PASS
5	PRN:1921341242022	PAGARE SACHIN LAXMAN	9.75	8.61	PASS
6	PRN:1921341242023	AUCHARMAL PRASANNA BHALCHANDRA	9.10	8.34	PASS
7	PRN:1921341242024	CHOUDHARY T8 SARQUNNISA 8.SDULHAQUE	9.35	8.93	PASS
8	PRN:1921341242025	KHAN ARBAZ RAFIQUE	9.40	8.70	PASS
9	PRN:1921341242026	N8 SEELA TANZEEL GULAM MD NAZEERUDDIN	9.40	8.90	PASS
10	PRN:1921341242027	PAKHALE SHRAWASTI PREMNATH	9.20	8.23	PASS
11	PRN:1921341242028	DARWANTE SHUBHAM RAMCHANDRA	9.25	8.21	PASS
12	PRN:1921341242029	SALVE PRAMOD GAUTAM	9.25	8.33	PASS
13	PRN:1921341242030	WASEEM AHMED 8.SDUL RAHIM	9.30	8.37	PASS
14	PRN:1921341242031	SHAIKH AISHA BANO MOHAMMED ASIF	9.40	8.91	PASS
15	PRN:1921341242032	AVHALE SHALINI RAMESH	7.90	7.95	PASS
16	PRN:1921341242033	KHANDEKAR MAYURI MANGESH	9.50	8.60	PASS
17	PRN:1921341242034	ZAMBARE CHETANA PUSHPARAJ	8.60	7.88	PASS
18	PRN:1921341242035	PAWAR ANUSHKA NAVNATH	9.30	8.55	PASS
19	PRN:1921341242036	SHINDE SHIVANI ANIL	8.80	8.24	PASS
20	PRN:1921341242037	TELURE ARCHANA AVINASH	8.65	8.04	PASS
21	PRN:1921341242038	NIDA AFROZ IBRAHIM FARASH	9.10	8.18	PASS

22	PRN:1921341242039	KHAN FAISAL KHAN KHAN LIYAQAT KHAN	9.25	8.09	PASS
23	PRN:1921341242041	BODKHE ROHAN VILAS	8.95	8.17	PASS
24	PRN:1921341242042	SHAIKH SARA MOHAMMED SAFIULLAH	9.20	8.58	PASS
25	PRN:1921341242043	DAMALE ARTI SURESH	9.30	8.16	PASS
26	PRN:1921341242044	NIKAM VARSHA PRAKASH	7.70	7.42	PASS
27	PRN:1921341242045	JADHAV DNYANESHWAR SAHEBRAO	9.10	8.01	PASS
28	PRN:1921341242046	FAROOQUI MOHAMMED YOUSUF ASHFAQ	9.00	8.25	PASS
29	PRN:1921341242049	JADHAV DHIRAJ BALKRUSHNA	9.30	8.11	PASS
30	PRN:1921341242052	DHOTRE VAISHANVI DILIP			FAIL
31	PRN:1921341242053	WAKUDE RAHUL ARJUN	9.25	8.37	PASS
32	PRN:1921341242054	KHANDALE POOJA B8.5AN	9.40	8.41	PASS
33	PRN:1921341242055	SHAIKH S8.SIR SHAIKH TAHER	8.35	7.79	PASS
34	PRN:1921341242056	RATHOD MANISHA BHIMDEO	9.05	7.75	PASS
35	PRN:1921341242057	SHAIKH AHSAN 8.SDUL SALEEM	9.65	8.34	PASS
36	PRN:1921341242058	JADHAV PRIYANKA PANDURANG	9.10	8.54	PASS
37	PRN:1921341242059	CHAUS RAIYAN AWAD	9.05	8.40	PASS
38	PRN:1921341242093	KANOJE YOGESHWARI DINESH	9.65	8.48	PASS
39	PRN:1921341242094	MALI PRIYANKA TUKARAM	9.25	8.78	PASS
40	PRN:1921341242095	BANSODE RUPALI RAJENDRA	8.60	8.12	PASS
41	PRN:1921341242096	KAMBLE AMOL SUNIL	9.00	8.32	PASS
42	PRN:1921341242097	BANGAR KRUSHNA PRALHAD	9.10	8.33	PASS
43	PRN:1921341242099	GAVHANE PRATIKSHA PRAKASH	9.30	8.19	PASS
44	PRN:1921341242100	SHAIKH 9DIL SHAIKH AKBAR	9.05		FAIL
45	PRN:1921341242101	BAGHDANE VAIBHAV VILAS	9.25	8.10	PASS
46	PRN:1921341242102	PAWAR PRATIKSHA TULSHIRAM	9.40	8.53	PASS
47	PRN:1921341242103	DANDEKAR RUTUJA VASANT	9.30	8.39	PASS
48	PRN:1921341242104	RATHOD POONAM VIJAYSINGH	9.05	8.49	PASS
49	PRN:1921341242105	AMAGE ANJALI ANNARAO	8.70	8.30	PASS
50	PRN:1921341242106	PADME 9RTI NAMDEO	9.45	8.66	PASS
51	PRN:1921341242107	NIRANJAN TORVI	9.40	8.70	PASS
52	PRN:1921341242108	THORAT NIKHIL BHAUSAHEB	9.45	8.74	PASS

53	PRN:1921341242109	SYED AHMEDULLAH JASER ASADULLAH	9.25	8.42	PASS
54	PRN:1921341242110	PAWAR AJAY BAJIRAO	8.95	8.10	PASS
55	PRN:1921341242111	JOSHI PRATHMESH SANTOSH	9.35	8.36	PASS
56	PRN:1921341242112	BHOSLE GIRISH EKNATH	9.40	8.74	PASS
57	PRN:1921341242113	BORADE ANKITA SHAMRAO	9.45	8.82	PASS
58	PRN:1921341242114	BARHATE MRUNALI PRAKASHRAO	9.20	8.21	PASS
59	PRN:1921341242115	KALE VISHAL DEVIDAS	9.35	8.36	PASS
60	PRN:1921341242116	SHAIKH JUNED ASLAM			FAIL
61	PRN: 1921341242119	QUADRI SYED REHAN ALI SYED IMRAN	8.95	8.27	PASS
62	PRN:1921341242123	SAHIL KUMAR	9.65	8.43	PASS
63	PRN:2021341242001	PINJARI ASHPAK AHAKK	9.40	7.49	PASS
64	PRN:2021341242002	SHAIKH SHAHID SHAIKH AHMAD	9.00	7.31	PASS
65	PRN:2021341242003	HASHMI SYED WAQUAS SYED WASIF	9.65	8.22	PASS
66	PRN:2021341242004	SIRSAT UPENDRA UTTAM	9.45	7.58	PASS
67	PRN:2021341242005	TANDALE PRASAD PANDURANG	8.75	7.53	PASS
68	PRN:20213420171124210013	WANKHEDE AKSHAY SURESH	9.25	7.71	PASS
69	PRN:20213420171124210016	GANGAWANE ANIKET NANA	8.60	7.99	PASS
70	PRN:20213420171124210022	SHAIKH SHAHID JB SER	9.20	8.29	PASS
71	PRN:20213420171124210049	KUNDE AYUSH DILIP	9.45	8.13	PASS
72	PRN:20213420181124210003	JOGDAND APARAJITA SHANKAR	9.30	8.42	PASS
73	PRN:20213420181124210006	PAYAL BHANDAS DHANAIT	9.40	8.40	PASS
74	PRN:20213420181124210007	SARVADE SANKET SANJAY	9.40	7.87	PASS
75	PRN:20213420181124210008	9MER MOIZ SHAIKH MASUD	9.45	8.41	PASS
76	PRN:20213420181124210009	GIRHE PRAJWAL ANNASAHEB	9.30	7.92	PASS
77	PRN:20213420181124210011	SAYYED MUSTAKIM JILANI	9.45	8.64	PASS
78	PRN:20213420181124210012	GANDLE ARYAN SAMEER	8.90	8.11	PASS
79	PRN:20213420181124210013	MHASKE VISHWAJA SANJAY	9.20	8.03	PASS
80	PRN:20213420181124210014	SURYAWANSHI PAYAL PRAVIN	9.30	8.38	PASS
81	PRN:20213420181124210015	KHOJE POOJA ARJUN	8.30	8.76	PASS
82	PRN:20213420181124210016	KALE RUTUJA MADHUKAR	9.30	8.49	PASS
83	PRN:20213420181124210018	AMBULGEKAR SHRUSHTI MANOJ	10.00	9.35	PASS
84	PRN:20213420181124210019	MENE VAISHNAVI SANTOSH	9.75	8.57	PASS

85	PRN:2021342018112421002O	JADHAV NILESH RAVINDRA	8.95	7.89	PASS
86	PRN:2021342018112421002 2	SYED SAQUIB MOHAMMED	9.20	8.01	PASS
87	PRN:2021342018112421002 3	QURESHI MAHEK FATIMA NASEER AHMED	9.50	9.06	PASS
88	PRN:2021342018112421002 5	GAIKWAD YASH ARVIND	9.75	9.03	PASS
89	PRN:2021342018112421002 6	BANDAWAR SANKET SUNIL	9.65	8.20	PASS
90	PRN:2021342018112421002 7	MARMAT TEJAS SHANKARSING	8.90	7.92	PASS
91	PRN:2021342018112421003 0	NIRMAL SHREYAS VIVEK	9.00	7.90	PASS
92	PRN:2021342018112421003 4	RASAL SOMESH SHRIRAM	9.10	8.11	PASS
93	PRN:2021342018112421003 5	JADHAV VISHAL RAMDAS	8.60	7.88	PASS
94	PRN:2021342018112421003 6	SATDIVE MANSI RAYBHAN	9.85	8.38	PASS
95	PRN:2021342018112421003 8	RAZVI SYEDA ZEBA SYED VASI HUSSAIN	9.45	8.68	PASS
96	PRN:2021342018112421004 0	GHODELE NIDHI DILIP	9.40	8.81	PASS
97	PRN:2021342018112421004 1	SHAIKH ANEES AHMED MOHAMMED	9.25	8.04	PASS
98	PRN:2021342018112421004 3	DHUMAL RAKSHANDA VIJAY	9.15	8.52	PASS
99	PRN:2021342018112421007 7	ANSARI MOHD N8 SEEL MOHD SAMEE	8.95	8.01	PASS
100	PRN:2021342018112421008 2	SAMYAK VIKAS NIMSARKAR	9.70	8.10	PASS
101	PRN:2021342018112421100 1	SHAIKH ADIBA KASHISH SHAIKH TAHER	9.65	8.67	PASS
102	PRN:2021342018112421100 2	MAGAR ASHWINI GORAKH	9.65	8.90	PASS
103	PRN:2021342018112421100 3	SHAIKH MUBASSHAR MUMTAZ	9.60	8.44	PASS
104	PRN:2021342018112421100 4	MAHAJAN ANAND SHESHRAO	9.15	8.12	PASS
105	PRN:2021342018112421100 5	MALI PRAJAKTA DASHRATH			PASS
106	PRN:2021342018112421100 6	SYED AHMED AM9N AHMED ADNAN	9.45	7.94	PASS

Total Result :

Appeared	106	100%
Pass	103	97.16%
Fail	4	3.77%
Distinction	99	93.39%
First Class	3	2.91%
Second Class	0	0.00%

Subjectwise Result Analysis :

Subject	Pass	Pass %	fail	Fail %	Pass Class	Pass Class%	Second Class	Second Class%	First Class	First Class %	Distinction	Distinction %
SE	103	97%	3	2.83%	0	0.0%	2	1.9%	3	2.83%	98	92.45%
DIP	106	100%	0	0.0%	0	0.0%	0	0.0%	1	0.9%	105	99.05%
CC	106	100%	0	0.0%	0	0.0%	0	0.0%	4	3.8%	102	96.22%
DT	106	100%	0	0.0%	0	0.0%	1	0.9%	2	1.9%	103	97.16%
PROJECT PART I	106	100%	0	0.0%	0	0.0%	1	0.9%	1	0.9%	105	99.05%

Class Teacher
Prof. Gauhar Zareen

HOD
Dr.V.B.Kamble

PES COLLEGE OF ENGINEERING, A'BAD

BTECH CSE 2021-22

8TH SEMESTER BATU RESULT

SR. NO.	NAME	CGPA	Percentage
1	GANDHI SHARON	8.42	84.20
2	GODESWAR APURVA	8.30	83.00
3	MOHAMMED SOHAIL	8.46	84.60
4	SHAIKH FURKHAN	8.21	82.10
5	PAGARE SACHIN	8.71	87.10
6	AUCHARMAL PRASANNA	8.29	82.90
7	CHOUDHARY TABARQUNNISA	8.85	88.50
8	KHAN ARBAZ	8.79	87.90
9	NABEELA TANZEEL	8.98	89.80
10	PAKHALE SHRAWASTI	8.20	82.00
11	DARWANTE SHUBHAM	8.22	82.20
12	SALVE PRAMOD	8.30	83.00
13	WASEEM AHMED	8.39	83.90
14	SHAIKH AISHA	8.97	89.70
15	AVHALE SHALINI	7.96	79.60
16	KHANDEKAR MAYURI	8.54	85.40
17	ZAMBARE CHETANA	8.01	80.10
18	PAWAR ANUSHKA	8.52	85.20
19	SHINDE SHIVANI		
20	TELURE ARCHANA	8.05	80.50
21	NIDA AFROZ	8.09	80.90
22	KHAN FAISAL	8.13	81.30
23	BODKHE ROHAN	8.14	81.40
24	SHAIKH SARA	8.51	85.10
25	DAMALE ARTI	8.17	81.70
26	NIKAM VARSHA	7.44	74.40
27	JADHAV DNYANESHWAR	8.14	81.40
28	FAROOQUI MOHAMMED YOUSUF	8.21	82.10
29	JADHAV DHIRAJ	8.14	81.40
30	DHOTRE VAISHANVI		
31	WAKUDE RAHUL	8.32	83.20
32	KHANDALE POOJA	8.38	83.80
33	SHAIKH SABIR	7.9	79.00
34	RATHOD MANISHA	7.84	78.40
35	SHAIKH AHSAN	8.38	83.80
36	JADHAV PRIYANKA	8.46	84.60
37	CHAUS RAIYAN	8.38	83.80

38	KANOJE YOGESHWARI	8.44	84.40
39	MALI PRIYANKA	8.69	86.90
40	BANSODE RUPALI	8.09	80.90
41	KAMBLE AMOL	8.45	84.50
42	BANGAR KRUSHNA	8.28	82.80
43	GAVHANE PRATIKSHA	8.16	81.60
44	SHAIKH AADIL		
45	BAGHDANE VAIBHAV	8.09	80.90
46	PAWAR PRATIKSHA	8.43	84.30
47	DANDEKAR RUTUJA	8.36	83.60
48	RATHOD POONAM	8.39	83.90
49	AMAGE ANJALI	8.33	83.30
50	PADME AARTI	8.59	85.90
51	NIRANJAN TORVI	8.84	88.40
52	THORAT NIKHIL	8.73	87.30
53	SYED AHMEDULLAH JASER	8.57	85.70
54	PAWAR AJAY	8.07	80.70
55	JOSHI PRATHMESH	8.34	83.40
56	BHOSLE GIRISH	8.63	86.30
57	BORADE ANKITA	8.88	88.80
58	BARHATE MRUNALI	8.18	81.80
59	KALE VISHAL	8.3	83.00
60	SHAIKH JUNED		
61	QUADRI SYED REHAN	8.4	84.00
62	SAHIL KUMAR	8.46	84.60
63	PINJARI ASHPAK	7.56	75.60
64	SHAIKH SHAHID	7.45	74.50
65	HASHMI SYED WAQUAS	8.42	84.20
66	SIRSAT UPENDRA	7.6	76.00
67	TANDALE PRASAD	7.56	75.60
68	WANKHEDE AKSHAY	7.73	77.30
69	GANGAWANE ANIKET	7.98	79.80
70	SHAIKH SHAHID JABER	8.30	83.00
71	KUNDE AYUSH DILIP	8.25	82.50
72	JOGDAND APARAJITA	8.50	85.00
73	PAYAL BHANDAS	8.35	83.50
74	SARVADE SANKET	8.02	80.20
75	AAMER MOIZ	8.43	84.30
76	GIRHE PRAJWAL	8.04	80.40
77	SAYYED MUSTAKIM	8.70	87.00
78	GANDLE ARYAN	8.12	81.20
79	MHASKE VISHWAJA	7.98	.79.80

60	SURYAWANSHI PAYAL	8.47	84.70
61	KHOJE POOJA	8.70	87.00
62	KALE RUTUJA	8.43	84.30
83	AMBULGEKAR SHRUSHTI	9.35	93.50
84	MENE VAISHNAVI	8.59	85.90
85	JADHAV NILESH RAVINDRA	8.05	80.50
86	SYED SAQUIB	8.14	81.40
87	QURESHI MAHEK	8.93	89.30
88	GAIKWAD YASH	9.0	90.00
89	BANDAWAR SANKET		
90	MARMAT TEJAS	8.02	80.20
91	NIRMAL SHREYAS	8.06	80.60
92	RASAL SOMESH	8.12	81.20
93	JADHAV VISHAL		
94	SATDIVE MANSI	8.49	84.90
95	RAZVI SYEDA ZEBA	8.64	86.40
96	GHODELE NIDHI	8.86	88.60
97	SHAIKH ANEES AHMED	7.99	79.90
98	DHUMAL RAKSHANDA	8.48	84.80
99	ANSARI MOHD NABEEL	7.96	79.60
100	SAMYAK VIKAS	8.24	82.40
101	SHAIKH ADIBA	8.75	87.50
102	MAGAR ASHWINI	8.95	89.50
103	SHAIKH MUBBASSHAR	8.55	85.50
104	MAHAJAN ANAND	8.43	84.30
105	MALI PRAJAKTA		
106	SYED AHMED AMAAN	8.02	80.20

Total appeared-106	Passing percentage-93.39%	
Total passed-99		
Total failed-7		

Destinction-97	Destinction percentage-91.50%
First class-2	First class percentage-1.88%
Second class-0	Second class percentage-0.0%
Fail-7	Fail percentage-6.60%

CLASS TEACHER
PROF. GAUHAR ZAREEN

HOD

P.E.S College Of Engineering, Aurangabad
Department Of Computer Science & Engineering
TYCSE AY-2021-22
SEM V Result Analysis

Sr.No	PRN	Name	SCPA	CGPA	%	RESULT
1	1921341242001	MOHAMMED FAIZ MOHAMMED SHAKEEL	9.33	8.27	82.7	PASS
2	1921341242002	SHAIKH JUNED SHAIKH JILANI	9.57	8.18	81.8	PASS
3	1921341242004	KOKATE SHANTANU SANJAY	9.48	8	80	PASS
4	1921341242005	SURYA AADITI ASHOKRAO	9.43	8.53	85.3	PASS
5	1921341242006	DHADVE RADHESHAM JANARDHAN	9.1	8.42	84.2	PASS
6	1921341242007	SOLAT NEHA MOHAN	9.48	8.3	83	PASS
7	1921341242008	KHANDARE ROHIT NARAYAN	9	7.82	78.2	PASS
8	1921341242009	SHAIKH ABDUL GAFOOR ABDUL HADI	9.296	8.3	83	PASS
9	1921341242010	AKASH WADGAONKAR	9.38	8.86	88.6	PASS
10	1921341242013	GANORKAR ADARSH JAYKUMAR	9.62	8.21	82.1	PASS
11	1921341242014	GAIKWAD SANDHYA DILIP	9.33	8.01	80.1	PASS
12	1921341242018	SHINDE RAM HARIDAS	9.43	8.56	85.6	PASS
13	1921341242019	SINGH ABHAY PRABHUNATH	9.14	8.14	81.4	PASS
14	1921341242020	UMAR ABDUL AZIZ ABDUL WAHEED	9.62	8.73	87.3	PASS
15	1921341242021	SHAIKH ZAFAR AFSAR	9.43	8.35	83.5	PASS
16	1921341242040	TAHA AQDAS SHAIKH	9.43	8.35	83.5	PASS
17	1921341242047	MORE ROSHAN RAJENDRA	9.24	8.39	83.9	PASS
18	1921341242051	PARKHE SANJANA AJAY	9.52	8.68	86.8	PASS
19	1921341242060	SATPUTE GUNJAN RAJENDRA	9.43	8.23	82.3	PASS
20	1921341242061	SYED ADNAN ALI AHMED ALI	9.29	8.45	84.5	PASS
21	1921341242062	PAIKRAO NIKITA ANAND	9.33	7.95	79.5	PASS
22	1921341242063	KASHIDE GAURAV SANJAY	9.67	8.66	86.6	PASS
23	1921341242064	ASNA MAHVISH SAJID KHAN	9.43	8.59	85.9	PASS
24	1921341242065	PAUL ROHIT MADHUKAR	9.43	8.01	80.1	PASS
25	1921341242066	HADULKAR UTKARSH ANIL	9.43	8.58	85.8	PASS

26	1921341242067	GAGAN ADNAN AJAZ	9.14	7.67	76.7	PASS
27	1921341242068	KHAN AHESAN DANISH AUSAF KHAN	9.14	8	80	PASS
28	1921341242069	KHAN AMENA IMROZ MHOD AKHTAR	9.298	8.32	83.2	PASS
29	1921341242070	BODHANE PRATIK KRISHNA	9.24	8.37	83.7	PASS
30	1921341242071	MOHAMMAD ASHHERUDDIN MOHAMMAD AKHTERUDDIN	9.57	8.75	87.5	PASS
31	1921341242072	RATHOD SHRUTI MUKESHKUMAR	9.57	8.96	89.6	PASS
32	1921341242073	RATHOD PRATIK DHARMRAJ	9.62	8.91	89.1	PASS
33	1921341242074	THAKUR PRAVIN RAMKISHAN	9.57	9	90	PASS
34	1921341242075	RATHOD AKSHAD ANIL	9.43	8.62	86.2	PASS
35	1921341242076	SHAIKH AHMED FAZAL RAFIK	9.62	8.52	85.2	PASS
36	1921341242077	BORKAR RITIKA GANGADHAR	9.43	8.54	85.4	PASS
37	1921341242078	KHAN AMAANULLAH SHAHID AHMED	9.48	8.06	80.6	PASS
38	1921341242079	SHAIKH SALEHA AFROZ YUSUF	9.48	8.32	83.2	PASS
39	1921341242080	GADEKAR SWAPNIL VILAS	9.43	8.5	85	PASS
40	1921341242081	RATHOD AMOL PRAKASH	9.19	7.81	78.1	PASS
41	1921341242082	PATEL OM HEMANT	9.62	8.78	87.8	PASS
42	1921341242083	SYED ZAINUDDIN GOUSUDDIN KIRMANI	9.38	8.23	82.3	PASS
43	1921341242084	KHAN ARIF MOHAMMAD MOHAMMAD MUSLIM	9.62	8.5	85	PASS
44	1921341242085	MYAKAL SHREYASH KRISHNA	9.43	8.39	83.9	PASS
45	1921341242087	JADHAV HRISHIKESH BALKRUSHNA	9.52	8.25	82.5	PASS
46	1921341242088	MOHD MUZAMMILUDDIN MOHD FAYAZUDDIN	NA	NA	NA	Fail
47	1921341242089	GHANGHAV MAYUR SURESH	9.57	8.39	83.9	PASS
48	1921341242091	SALVE ANIL NATHU	9.24	NA	NA	PASS
49	1921341242092	PATANGE KESHAV VIVEKANAND	8.76	7.24	72.4	PASS
50	1921341242117	BADWANE SAURBH SANDULAL	9.14	8.12	81.2	PASS
51	1921341242118	SHAIKH NEHAL AHMED MUKHTAR	9.29	8.15	81.5	PASS
52	1921341242120	GANVIR SEJAL CHANDRAKANT	9.29	NA	NA	PASS
53	1921341242121	MOHAMMAD UBAID UR RAHEMAAN MOHAMMAD JAWEED	9.14	7.8	78	PASS
54	1921341242122	SHIRALE ONKARESHWAR AMBADAS	9.29	8.46	84.6	PASS
55	1921341242124	ABHANG PRATIK BARKU	NA	NA	NA	Fail
56	1921341612019	PATHAN DANISH KHAN HYDER KHAN	9.48	8.06	80.6	PASS
57	2021341242006	ABDUL KASHIF SHAIKH RAUF	9.14	9.03	90.3	PASS
58	2021341242007	SHAIKH SAMEER SHAIKH MUSHTAK	9.29	8.94	89.4	PASS

59	2021341242008	KHILLARE TUKARAM SAMBHAJI	9.38	9.11	91.1	PASS
60	2021341242009	GAIKWAD BHAGYSHRI ANAND	9.52	9.11	91.1	PASS
61	2021341242010	SHIRASE OMKAR SANJAY	9.48	9.39	93.9	PASS
62	2021341242011	JOSHI PRASAD MILIND	9.43	9.18	91.8	PASS
63	2021341242012	LODHA SIDDHARTH SANTOSH	9.48	9.06	90.6	PASS
64	2021341242013	SHAIKH RIZWAN SK KHALIL	9.24	9.33	93.3	PASS
65	2021341242014	GOSAVI PRATIK SUNIL	9.43	9.39	93.9	PASS
66	2021341242015	SHAIKH FAIZ AHMED SAMEER	9.05	8.02	80.2	PASS
67	2021341242017	CHONDE GIRISH HARISHCHANDRA	9.52	9.24	92.4	PASS
68	2021341242018	ZODGE PRAKASH RAJESH	9.62	9.5	95	PASS
69	2021341242019	RANDHE SANKET VILAS	NA	NA	NA	Fail
70	2021341242020	LAMSOGE SUDIP VINOD	9.1	8.56	85.6	PASS
71	2021341242021	KHANDEKAR ANIKET GUNVANT	9.38	9.33	93.3	PASS
72	2021341242022	DESHPANDE PRAJWAL PRAMOD	9.43	9.36	93.6	PASS
73	2021341242022	KHARAT RAJ RAVI	9.19	8.83	88.3	PASS
74	2021341242024	SHAIKH MD AZEEM SHAIKH NAZIMUDDIN	9.24	8.55	85.5	PASS
75	2021341242025	BHANDARE VAISHNAVI KRISHNA	8.62	9.06	90.6	PASS
76	2021341242027	PATIL ADITYA VIJAY	9.29	8.82	88.2	PASS
77	2021341242029	RANVIR SHIVANI PANJABRAO	9.52	9.23	92.3	PASS
78	2021341242030	KALASKAR NARAYAN PURUSHOTTAM	9.43	9.21	92.1	PASS
79	2021341242031	NIMBALKAR KULDEEP DILIPRAO	9.52	9.36	93.6	PASS
80	2021341242032	BANKAR SWAPNIL RAJU	9.52	9.17	91.7	PASS
81	2021341242033	BURSE PURVA SHANTINATH	9.57	9.38	93.8	PASS
82	2021341242034	SHEVALE KALYANI KAMALAKAR	8.95	8.38	83.8	PASS
83	2021341242035	SONAWANE SHUBHAM SANJAY	9.38	9.32	93.2	PASS
84	2021341242036	KHANDEKAR PRATIK PRABHUDAS	9.29	8.92	89.2	PASS
85	2021341242037	KAMBLE AJAY DAGADU	NA	NA	NA	Fail
86	2021341242038	QUADRI ZAKIUDDIN NAYEEMUDDIN	9.29	8.56	85.6	PASS
87	2021341242039	KANDANGIRE ANIKET GOVIND	9.29	9.18	91.8	PASS
88	2021341242040	SHAHAPURKAR GEETIKA VIJAY	9.24	9.21	92.1	PASS
89	2021341242041	SHAIKH ZOYA SAMEEN MOHAMMED FAROOQUE	9.24	8.94	89.4	PASS
90	2021341242042	SHEIKH DANISACH DINESHRAJ	9.62	8.92	89.2	PASS
91	2021341242043	JOSHI HIMANSHU NAIL NIRAJ	9.1	8.77	87.7	PASS

92	2021341242045	LEHEKAR SAMRUDDHI SANJAY	9.33	9.32	93.2	PASS
93	2021341242046	WAGH POOJA BABASAHEB	9.29	9.2	92	PASS
94	2021341242047	: INGLE NAMRATA BHAGWANRAO	8.48	8.53	85.3	PASS
95	2021341242048	THUBE SHITAL KAILAS	9.38	9.21	92.1	PASS
96	2021341242049	RAUT SUWARNA SUDHAKAR	8.95	8.73	87.3	PASS
97	2021341242050	KATKAR SURAJ SURYAKANT	9.43	9.21	92.1	PASS
98	2021341242051	NIDHONKAR MAYURI SHANTARAM	9.1	9.14	91.4	PASS
99	2021341242052	RATHOD VAISHNAVI RAJESH	9.43	9.32	93.2	PASS
100	2021341242053	SHELKE PRAJAKTA PANDURANG	9.19	9.09	90.9	PASS
101	2021341242054	KAMBLE APEKSHA PRADEEP	9.76	9.3	93	PASS
102	2021341242055	JADHAV KRUSHNALI SAIDAS	9.33	9.14	91.4	PASS
103	2021341242056	GOJE VEDANT JITENDRA	9.48	9.42	94.2	PASS
104	2021341242057	KHADKIKAR SHRINIVAS SATISHRAO	9.24	8.05	80.5	PASS
105	2021341242058	KHAN DANISH FARROQ	9.29	9.02	90.2	PASS
106	2021341242059	SHAIKH WAJIT RUSTUM	9.29	9.06	90.6	PASS
107	2021341242060	SHAIKH MOHAMMAD AADIL NAZER	9.14	9.09	90.9	PASS
108	2021341242061	BHAGADE SHIVANI SUBHASH	9.19	9.09	90.9	PASS
109	2021341242062	GOVANDE PRANALI BHIMRAO	9.14	8.09	80.9	PASS
110	2021341242063	KHANDALE PRADNYA SURESHRAO	8.52	8.33	83.3	PASS
111	20213420171124200000	JADHAV SNEHA SUKHDEORAO	8.52	8.34	83.4	PASS
112	20213420171124200000	MAGARE RUPALI RATAN	9.14	7.7	77	PASS
113	20213420181124200000	SIDDIQUI FATIMA ANAM JAWEED AHMED	8	7.93	79.3	PASS
114	20213420181124200000	MANE SHUBHAM GAUTAM	9.24	9.24	92.4	PASS

Total Result :

Appeared	114	100%
Pass	110	96.49%
Fail	4	3.50%
Distinction	109	95.61%
First Class	1	0.89%
Second Class	0	0.00%

Subjectwise Result Analysis :

Subject	Pass	Pass %	fail	Fail %	Pass Class	Pass Class%	Second Class	Second Class%	First Class	First Class %	Distinction	Distinction %
DBS	111	97.37%	3	3.50%	1	0.99%	0	0%	1	0.90%	109	98.19%
TOC	112	98.25%	2	3.50%	0	0%	0	0%	1	0.90%	111	99.10%
ML	111	97.37%	3	3.50%	0	0%	0	0%	0	0%	111	100%
ITR	112	98.25%	2	3.50%	0	0%	0	0%	0	0%	112	100%
BC	111	97.37%	3	3.50%	1	0.99%	0	0%	11	9.90%	99	89.18%
CP I	114	100.00%	0	3.50%	0	0%	64	56%	36	31.57%	14	12.28%
Seminar	113	99.12%	1	0.88%	0	0%	0	0%	9	7.95%	104	92.03%
Internship	114	100.00%	0	0%	4	0%	15	0%	18	15.78%	87	76%

Class Teacher
Prof.S.R.Kamble

Head
Dr.V.B.Kamble

P.E.S College Of Engineering, Aurangabad
Department Of Computer Science & Engineering
TYCSE AY-2021-22
SEM VI Result Analysis

Sr.No	PRN	Name	SCPA	CGPA	%	RESULT
1	1921341242001	MOHAMMED FAIZ MOHAMMED SHAKEEL	5.75	7.86	78.6	Pass
2	1921341242002	SHAIKH JUNED SHAIKH JILANI	0	0	0	Fail
3	1921341242004	KOKATE SHANTANU SANJAY	0	0	0	fail
4	1921341242005	SURYA AADITI ASHOKRAO	6.05	8.12	81.2	Pass
5	1921341242006	DHADVE RADHESHAM JANARDHAN	5.9	8.01	80.1	Pass
6	1921341242007	SOLAT NEHA MOHAN	6.3	7.98	79.8	Pass
7	1921341242008	KHANDARE ROHIT NARAYAN	5.55	7.45	74.5	Pass
8	1921341242009	SHAIKH ABDUL GAFOOR ABDUL HADI	0	0	0	fail
9	1921341242010	AKASH WADGAONKAR	5.75	8.36	83.6	Pass
10	1921341242013	GANORKAR ADARSH JAYKUMAR	0	0	0	fail
11	1921341242014	GAIKWAD SANDHYA DILIP	5.75	7.64	76.4	Pass
12	1921341242018	SHINDE RAM HARIDAS	5.75	8.11	81.1	Pass
13	1921341242019	SINGH ABHAY PRABHUNATH	0	0	0	Fail
14	1921341242020	UMAR ABDUL AZIZ ABDUL WAHEED	6.7	8.4	84	Pass
15	1921341242021	SHAIKH ZAFAR AFSAR	0	0	0	Fail
16	1921341242040	TAHA AQDAS SHAIKH	6	7.97	79.7	Pass
17	1921341242047	MORE ROSHAN RAJENDRA	5.75	7.96	79.6	Pass
18	1921341242051	PARKHE SANJANA AJAY	6.2	8.28	82.8	Pass
19	1921341242060	SATPUTE GUNJAN RAJENDRA	5.95	7.86	78.6	Pass
20	1921341242061	SYED ADNAN ALI AHMED ALI	6.45	8.12	81.2	Pass
21	1921341242062	PAIKRAO NIKITA ANAND	0	0	0	fail
22	1921341242063	KASHIDE GAURAV SANJAY	5.9	8.21	82.1	Pass
23	1921341242064	ASNA MAHVISH SAJED KHAN	7.05	8.34	83.4	Pass
24	1921341242065	PAUL ROHIT MADHUKAR	6.85	8.58	85.8	Pass
25	1921341242066	HADGEKAR UTKARSH ANIL	5.85	8.13	81.3	Pass

27	1921341242067	GAGAN ADNAN AJAZ	5.8	7.36	73.6	Pass
28	1921341242068	KHAN AHESAN DANISH AUSAF KHAN	0	0	0	fail
29	1921341242069	KHAN AMENA IMROZ MHOD AKHTAR	5.8	7.91	79.1	Pass
30	1921341242070	BODHANE PRATIK KRISHNA	0	0	0	fail
31	1921341242071	MOHAMMAD ASHHERUDDIN MOHAMMAD AKHTERUDDIN	6.75	8.42	84.2	Pass
32	1921341242072	RATHOD SHRUTI MUKESHKUMAR	6.7	8.59	85.9	Pass
33	1921341242073	RATHOD PRATIK DHARMRAJ	6.65	8.54	85.4	Pass
34	1921341242074	THAKUR PRAVIN RAMKISHAN	5.95	8.5	85	Pass
35	1921341242075	RATHOD AKSHAD ANIL	6.2	8.23	82.3	Pass
36	1921341242076	SHAIKH AHMED FAZAL RAFIK	5.8	8.07	80.7	Pass
37	1921341242077	BORKAR RITIKA GANGADHAR	5.95	8.12	81.2	Pass
38	1921341242078	KHAN AMAANULLAH SHAHID AHMED	5.9	7.7	77	Pass
39	1921341242079	SHAIKH SALEHA AFROZ YUSUF	6.8	8.07	80.7	Pass
40	1921341242080	GADEKAR SWAPNIL VILAS	0	0	0	fail
41	1921341242081	RATHOD AMOL PRAKASH	0	0	0	fail
42	1921341242082	PATEL OM HEMANT	6.45	8.4	84	Pass
43	1921341242083	SYED ZAINUDDIN GOUSUDDIN KIRMANI	0	0	0	fail
44	1921341242084	KHAN ARIF MOHAMMAD MOHAMMAD MUSLIM	6.05	8.1	81	Pass
45	1921341242085	MYAKAL SHREYASH KRISHNA	5.9	7.98	79.8	Pass
46	1921341242087	JADHAV HRISHIKESH BALKRUSHNA	6.2	7.92	79.2	Pass
47	1921341242088	MOHD MUZAMMILUDDIN MOHD FAYAZUDDIN	NA	NA	NA	Fail
48	1921341242089	GHANGHAV MAYUR SURESH	0	0	0	fail
49	1921341242091	SALVE ANIL NATHU	5.9	7.29	72.9	Pass
50	1921341242092	PATANGE KESHAV VIVEKANAND	0	0	0	fail
51	1921341242117	BADWANE SAURBH SANDULAL	5.7	7.72	77.2	Pass
52	1921341242118	SHAIKH NEHAL AHMED MUKHTAR	5.8	7.76	77.6	Pass
53	1921341242120	GANVIR SEJAL CHANDRAKANT	6.15	NA	NA	Pass
54	1921341242121	MOHAMMAD UBAID UR RAHEMAAN MOHAMMAD JAWEED	0	0	0	Fail
55	1921341242122	SHIRALE ONKARESHWAR AMBADAS	8.3	8.1	81	Pass
56	1921341242124	ABHANG PRATIK BARKU	0	0	0	fail
57	1921341612019	PATHAN DANISH KHAN HYDER KHAN	0	0	0	fail
58	2021341242006	ABDUL KASHIF SHAIKH RAUF	5.9	8.3	83	Pass
59	2021341242007	SHAIKH SAMEER SHAIKH MUSHTAK	6.1	8.28	82.8	Pass

60	2021341242008	KHILLARE TUKARAM SAMBHAJI	5.8	8.33	83.3	Pass
61	2021341242009	GAIKWAD BHAGYSHRI ANAND	5.75	8.33	83.3	Pass
62	2021341242010	SHIRASE OMKAR SANJAY	6.1	8.63	86.3	Pass
63	2021341242011	JOSHI PRASAD MILIND	6.1	8.47	84.7	Pass
64	2021341242012	LODHA SIDDHARTH SANTOSH	5.80	8.3	83	Pass
65	2021341242013	SHAIKH RIZWAN SK KHALIL	6.35	8.64	86.4	Pass
66	2021341242014	GOSAVI PRATIK SUNIL	6.6	8.74	87.4	Pass
67	2021341242015	SHAIKH FAIZ AHMED SAMEER	0	0	0	fail
68	2021341242017	CHONDE GIRISH HARISHCHANDRA	0	0	0	fail
69	2021341242018	ZODGE PRAKASH RAJESH	5.80	8.3	83	Pass
70	2021341242019	RANDHE SANKET VILAS	0	0	0	fail
71	2021341242020	LAMSOGE SUDIP VINOD	0	0	0	Fail
72	2021341242021	KHANDEKAR ANIKET GUNVANT	6.75	8.72	87.2	Pass
73	2021341242022	DESHPANDE PRAJWAL PRAMOD	0	0	0	fail
74	2021341242022	KHARAT RAJ RAVI	5.8	7.36	73.6	Pass
75	2021341242024	SHAIKH MD AZEEM SHAIKH NAZIMUDDIN	0	0	0	Fail
76	2021341242025	BHANDARE VAISHNAVI KRISHNA	8.62	9.06	90.6	PASS
77	2021341242027	PATIL ADITYA VIJAY	5.85	8.13	81.3	Pass
78	2021341242029	RANVIR SHIVANI PANJABRAO	6.5	8.59	85.9	Pass
79	2021341242030	KALASKAR NARAYAN PURUSHOTTAM	6.75	8.64	86.4	Pass
80	2021341242031	NIMBALKAR KULDEEP DILIPRAO	7.25	8.86	88.6	Pass
81	2021341242032	BANKAR SWAPNIL RAJU	6.2	8.48	84.8	Pass
82	2021341242033	BURSE PURVA SHANTINATH	6.75	8.76	87.6	Pass
83	2021341242034	SHEVALE KALYANI KAMALAKAR	5.75	8.33	83.3	Pass
84	2021341242035	SONAWANE SHUBHAM SANJAY	7.25	8.84	88.4	Pass
85	2021341242036	KHANDEKAR PRATIK PRABHUDAS	0	0	0	Fail
86	2021341242037	KAMBLE AJAY DAGADU	5.85	NA	NA	Fail
87	2021341242038	QUADRI ZAKIUDDIN NAYEEMUDDIN	0	0	0	fail
88	2021341242039	KANDANGIRE ANIKET GOVIND	5.9	8.41	84.1	Pass
89	2021341242040	SHAHAPURKAR GEETIKA VIJAY	0	0	0	fail
90	2021341242041	SHAIKH ZOYA SAMEEN MOHAMMED FAROOQUE	6.6	8.4	84	Pass
91	2021341242042	SHELKE DANISACH DINESHRAJ	0	0	0	fail
	2021341242043	JOSHI HIMANSHU NARENDRA	0	0	0	fail

92	2021341242045	LEHEKAR SAMRUDDHI SANJAY	5.85	8.51	85.1	Pass
93	2021341242046	WAGH POOJA BABASAHEB	6.4	8.53	85.3	Pass
94	2021341242047	: INGLE NAMRATA BHAGWANRAO	0	0	0	fail
95	2021341242048	THUBE SHITAL KAILAS	0	0	0	fail
96	2021341242049	RAUT SUWARNA SUDHAKAR	5.85	8.06	80.6	Pass
97	2021341242050	KATKAR SURAJ SURYAKANT	5.9	8.43	84.3	Pass
98	2021341242051	NIDHONKAR MAYURI SHANTARAM	6.65	8.56	85.6	Pass
99	2021341242052	RATHOD VAISHNAVI RAJESH	7.8	8.97	89.7	Pass
100	2021341242053	SHELKE PRAJAKTA PANDURANG	6.6	8.5	85	Pass
101	2021341242054	KAMBLE APEKSHA PRADEEP	7.2	8.81	88.1	Pass
102	2021341242055	JADHAV KRUSHNALI SAIDAS	6.4	8.5	85	Pass
103	2021341242056	GOJE VEDANT JITENDRA	6.65	8.78	87.8	Pass
104	2021341242057	KHADKIKAR SHRINIVAS SATISHRAO	0	0	0	fail
105	2021341242058	KHAN DANISH FARROQ	6.3	8.38	83.8	Pass
106	2021341242059	SHAIKH WAJIT RUSTUM	0	0	0	fail
107	2021341242060	SHAIKH MOHAMMAD AADIL NAZER	6.2	8.01	80.1	Pass
108	2021341242061	BHAGADE SHIVANI SUBHASH	6.3	8.44	84.4	Pass
109	2021341242062	GOVANDE PRANALI BHIMRAO	0	0	0	fail
110	2021341242063	KHANDALE PRADNYA SURESHRAO	0	0	0	fail
111	20213420171124200000	JADHAV SNEHA SUKHDEORAO	6.6	8.07	80.7	Pass
112	20213420171124200000	MAGARE RUPALI RATAN	0	0	0	fail
113	20213420181124200000	SIDDIQUI FATIMA ANAM JAWEED AHMED	0	0	0	fail
114	20213420181124200000	MANE SHUBHAM GAUTAM	0	0	0	fail

Total Result :

Appeared	117	100%
Pass	78	66.66%
Fail	39	33.33%
Distinction	73	62.39%
First Class	5	4.27%
Second Class	0	0.00%

Subjectwise Result Analysis :

Subject	Pass	Pass %	fail	Fail %	Pass Class	Pass Class%	Second Class	Second Class%	First Class	First Class %	Distinction	Distinction %
CD	93	79.48	24	20.51%	64	68.81%	10	9%	15	16.12%	3	3.22%
CN	102	87.17	15	12.82%	67	66%	18	18%	13	12.74%	2	1.96%
IOT	109	93.16	11	9.40%	79	72%	13	12%	11	10%	2	2%
CB	106	90.59	4	3.41%	86	81%	0	0%	1	1%	0	1%
HCI/OOPJ	110	94.01	7	5.98%	0	0.00%	0	0%	71	64.54%	39	54.45%

Class Teacher
Prof.S.R.Kamite

HOD
Dr.V.B.Kamble

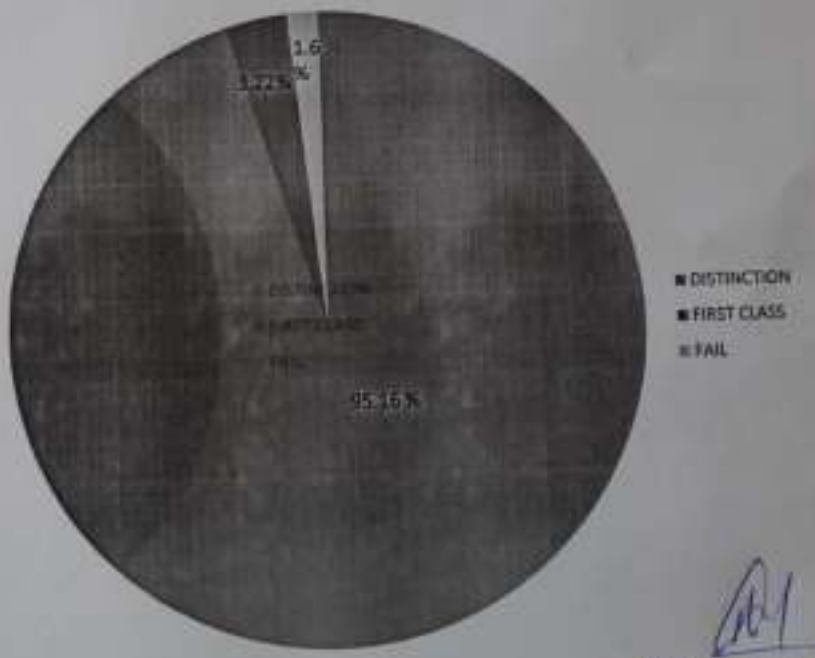
P. E. S. College of Engineering

Nagsenvana, Aurangabad (M.S.) - 431002

Department of Mechanical Engineering

Result Analysis of Final Year B. Tech. (Mechanical Sem. –VIII) Academic Year – 2021-22

Grade	No of Students	%
DISTINCTION	118	95.16
FIRST CLASS	4	3.22
FAIL	2	1.61
TOTAL NO OF STUDENTS	124	100



HEAD OF DEPARTMENT
Mechanical Engineering
PES College of Engineering
Aurangabad