

UNIVERSITY OF JAMMU

NOTIFICATION (18/Oct/Adp/74)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Competent Bodies, has been pleased to authorize the adoption of the revised Syllabi and Courses of Studies in **Bachelor of Engineering (E&C Engineering)** for Semester I & II under the **Choice Based Credit System** as per the model curriculum of the **AICTE (as given in the Annexure Pages 01 to 25)** for the candidates of **all (Govt./Pvt./UIET) Engineering Colleges affiliated with the University of Jammu** for the Examinations to be held in the years indicated against each Semester as under :-

Branch	Semester	For the Examination to be held in the years
E&C	Semester-I	December 2018, 2019, 2020 and 2021
	Semester-II	May 2019, 2020, 2021 and 2022
The Syllabi of	the course is available on the U	Iniversity Website: <u>www.jammuuniversity.in.</u>

s/d-DEAN ACADEMIC AFFAIRS

No. F.Acd/III/18/10779~10790 Dated: 3)/10/2018 Copy for information & necessary action to:-

- 1. Dean Faculty of Engineering
- 2. Principal, GCET/MIET/MBSCET/UIET/BCET/YCET
- 3. C.A to the Controller of Examinations
- 4. Assistant Registrar (Exams/Confidential)
- 5. Section Officer (Confidential)
- 6. Incharge University Website

Assistant Registrar (Academies 31 21/10

B.E. E&C Engineering First Semester Examination to be held in the Year Lecember 2018,2019,2020,2021

B.E. E&C Engineering 1st Semester

Contact Hrs.: 24

COURSE CODE	COURSE TYPE	COURSE TITLE	ALL) Tons	MARKS DISTRIBUTION		TOTAL MARKS	CREDITS	% Change
			L	T	Ρ	INTERNAL	EXTERNAL			
BSC -101	Basic Science Course	Engineering Mathematics-I	3	2	0	50	100	150	5	100
BSC-102	Basic Science Course	Engineering Physics	3	1	-	50	100	150	4	100
BSC-112	Basic Science Course	Engineering Physics (Lab)	-	-	3	50		50	1.5	100
ESC-101	Engineering Science Course	Computer Programming	3	1	-	50	100	150	4	100
ESC-111	Engineering Science Course	Computer Programming (Lab)	-	-	2	50	-	50	1	100
ESC-102	Engineering Science Course	Engineering Graphics	1	-	3	50	100	150	2.5	100
NCC-101	Non- Credit Course	Mentoring and Professional Development	-	-	2	Satisfactory / Un-Satisfactory			Non- Credit	
NCC-102		Environmental Sciences								
NCC-103		Indian Constitution								
TOTAL		10	4	10	300	400	700	18		

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CLASS: B.E. 1ST SEMESTER					
BRANCH: COMMON TO ALL BRANCHES					
COURSE TITLE: ENGINEERING MATHEMATICS-I			C	REDITS: 5	
COURSE No.: BSC-101					
DURATION EXAM.: 3 HRS					
	L	Т	Р	M	ARKS
				THEORY	SESSIONAL
	3	2	0	100	50

Course Outcomes: At the end of the course the Student will be able to

Learn the rules of nth derivative, to find maximum and minimum value of any function, to trace the curves. CO 1

- CO₂ Understand the concept of definite integrals and find arc length, area, surface area and volume of various curves.
- CO 3 Solve the differential equations of first order and higher order.
- differentiate the concept of scalars, vectors, gradient, divergence and curl. CO₄
- CO 5 Evaluate the complex no. in polar form and understand the idea of hyperbolic functions

Detailed Syllabus

UNIT - I Differential Calculus – I

Leibnitz theorem (without proof), Partial differentiation, Euler's theorem on homogeneous functions, Asymptotes, Double points, curvature, Curve tracing in Cartesian, polar and parametric forms.

UNIT – II Differential Calculus – II

Rolle's theorem , Mean value theorem , Taylor's and Maclaurin's series with remainder , Indeterminate forms , Taylor's series in two variables, Maxima and Minima of functions of two variables, Method of Lagrange's multiplier's.

UNIT – III Integral Calculus

Definite integrals with important properties, differentiation under the integral sign, Gamma, Beta and error functions with simple problems, applications of definite integrals to find length, area, volume and surface area of revolutions, transformation of coordinates, double and triple integrals with simple problems.

UNIT – IV Vector Calculus

Scalar and vector product of vectors, Derivatives of vectors, Partial derivatives of vectors, Directional derivatives and Gradient, Divergence and Curl of a vector, Vector Integration, Gauss's Divergence theorem, Green's theorem, Stoke's theorem,

UNIT – V Complex Trigonometry

Hyperbolic functions of a complex variable, Inverse Hyperbolic functions, Logarithmic function of a complex variable; Summation of series by C+ iS method.

UNIT - VI Ordinary Differential Equations

Differential equations of first order and first degree: Exact and non-exact differential equations, Linear and Bernoulli's differential equations. Higher order linear differential equations: Complementary solution, particular integral and general solution of these equations, variation of parameters technique to find particular integral of second order differential equations, Cauchy's and Lagrange's differential equations. Applications of ordinary differential equations to simple Electrical and Mechanical Engg. Problems.

(06 hrs)

(08 hrs)

(08 hrs)

(07 hrs)

(07 hrs)

(05 hrs)

BOOKS RECOMMENDED:

- 1. Calculus and Analytic Geometry
- 2. Differential Calculus
- 3. Vector Calculus
- 4. Higher Engineering Mathematics
- 5. Engineering Mathematics-I
- Dr. Bhopinder Singh

Thomas and Finney, 9th Edition, Pearson, 2002.

S. Narayan and P.K. Mittal, S.Chand, New Delhi.

S. Narayan and P.K. Mittal, S.Chand, New Delhi.

B.S Grewal, Khanna Publishers, New Delhi

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- **NOTE: (I)** There shall be total seven questions. Question no.1 is compulsory and short answer/ objective type .It will consists of 10 questions each of 01 mark (Total: 10 marks)
 - (II) There will be two questions from each unit. Attempt one question from each unit. Each question carry 15 marks.

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CLASS: B.E. 1ST SEMESTER BRANCH:COMPUTER/E&C/IT ENGINEERING COURSE TITLE: ENGINEERING PHYSICS COURSE No.: BSC-102 DURATION EXAM.: 3 HRS

CREDITS: 4

L	Т	Р	MARKS				
			THEORY	SESSIONAL			
3	1	0	100	50			

Course Outcomes (CO) : At the end of the course the Student will be able to -

- CO 1 Understand the significance of Maxwell's equations as the basis of Electromagnetic theory. Gain the knowledge on the basic concepts of Quantum Mechanics and its applications. Acquire the concepts of different types of oscillations.
- CO 2 Assimilates the basic concepts of Semiconductor Physics.
 Get familiar with different aspects of applied optics & their applications.
 Understand the working principle of various lasers and optical fibres and their applications in various fields.

SECTION - A

Module -I: ELECTROMAGNETIC FIELDS AND WAVES

Concepts of Del Operator- gradient, divergence, curl and their physical significances, Displacement Current. Maxwell's equations in vacuum and non conducting medium, Electromagnetic wave propagation in free space (e.m. wave equations for electric & magnetic fields for free space) & their solutions (plane wave solution), velocity of E.M. waves, Relation between $E_o \& B_o$, definition of Poynting vector, Poynting theorem.

8hrs, Weightage = 20%

Module -II : QUANTUM MECHANICS

Inadequacies of Classical Mechanics ,De-broglie's concept of Matter waves, Wave-packet (Wavegroup), Phase and Group velocity, Heisenberg's uncertainty Principle, Experimental illustration of Uncertainty principle using single slit, Wave-function definition, interpretation and significance of wave-function, Schrodinger's wave equation (Steady-state and Time dependent) for one- dimensional case, Concept of Operators and Expectation values, Applications of Schrodinger's equation (Time independent) to ;

i) Particle in a one-dimensional box of infinite height, ii) Single step potential barrier, iii) Tunnel effect,

9hrs, Weightage = 20%

Module-III : OSCILLATIONS

Damped and Forced oscillations and their differential equations, Logarithmic decrement, Relaxation time & Quality factor, Ultrasonic waves and their production by Piezoelectric method and general applications.

4hrs, Weightage = 10%

SECTION - B

Module -IV: SEMICONDUCTOR PHYSICS

Structure of Atoms, Energy Band diagram, Metal, Insulator and Semiconductor, Intrinsic and Extrinsic semiconductors, Direct & Indirect semiconductors, Bond in semiconductor & effect of temperature on semiconductors, Hole & Electron description, Charge densities in semiconductor, Generation & Recombination of charge carrier, Law of mobility & conductivity, Current densities in semiconductors, Fermi levels, Mass action law, Drift & Diffusion currents, Hall effect, Hall co-efficient & its applications.

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9hrs, Weightage = 20%

Module -V : APPLIED OPTICS

Interference in thin films (by reflection and transmission of light), Theory of Newton's rings by reflected light, Determination of wavelength and refractive index of monochromatic light by Newton's rings theory.

Fraunhoffer & Fresnel's diffractions, Fresnel's half period zones and rectilinear propagation of light,

Fraunhoffer diffraction due to a single slit , Plane diffraction grating& its theory for secondary maxima & minima.

Unpolarised and polarised light, Double refraction phenomenon, Nicol Prism, Mathematical representation of elliptically and circularly polarized light, Quarter and Half wave plates.

No. of Lectures -7, Weightage = 20%

Module VI : LASERS AND FIBRE OPTICS

Principal of Laser action, Einstein's co-efficients, Ruby & Co₂ Lasers, Holography, Propagation of Light in Optical fibres, Acceptance angle & acceptance cone, Numerical Aperture, Single mode & Multimode fibres, Characteristics and General applications of Lasers & Optical fibres.

No. of Lectures - 5, Weightage = 10%

TUTORIALS

T-1 Numerical Problems pertaining to topics in Unit-I
T-2 Numerical Problems based on topics in Unit-II
T-3 Numerical Problems related to topics in Unit-III
T-4 Numerical Problems based on topics in Unit- IV
T-5 Numerical Problems associated with topics in Unit-
T-6 Numerical Problems related to topics in Unit-VI

<u>NOTE</u>: There shall be a total of eight questions, four from Each Section A & Section B selecting at least one question from each module. Each question carries 20 marks. Five questions will have to be attempted. Selecting at least two from each section. Use of Scientific calculator is allowed.

Books Recommended:

TITLE

- 1. Physics
- 2. Fundamentals of Electricity & Magnetism
- 3. Modern Physics
- 4. Modern Physics
- 5. Modern Physics
- 6. Sound
- 7. Basic Electronics
- 8. Semi conductor Physics and Devices: Basic Principles
- 9. Optics
- 10. Fibre Optics
- 11. Lasers
- 12. Modern Engineering Physics

AUTHOR

- Reisnick & Halliday Duggal & Chabbra Beiser Blatt Gupta & Gupta Subramaniam Millman & Halkias
- Donald A. Neamen Brijlal & Subramaniam Ghatak, Tyagrajan K.R. Nambiyar A.S. Vasudeva

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CLASS: B.E. 1ST SEMESTER BRANCH:COMPUTER/E&C/IT ENGINEERING COURSE TITLE: ENGINEERING PHYSICS LAB COURSE No.: BSC-112 DURATION EXAM.: 3 HRS

L	Т	Р	MARKS					
			THEORY	PRACTICAL				
0	0	3	0	50				

CREDITS: 1.5

Course Outcomes :

At the end of the course the Student will be able to-

- CO-1 Gain knowledge about the scientific methods of measuring different physical parameters based on the concepts of Physics.
- CO-2 Develop the experimentation skills by displaying minimized measurement errors.
- CO-3 Demonstrate & improve the practical skills to use the appropriate physical concepts to obtain the solutions pertaining to different physics experiments.
- CO-4 Acquire a sense of scientific temper infused with innovation & creativity.

Experiment No.	Title of Experiment
Exp- I	To find the frequency of A.C. mains using an electrical vibrator.
Exp-II	To study the variation of magnetic field.
Exp-III	To verify the Faraday's laws.
Exp-IV	To find the co-efficient of self induction of a coil by Anderson's bridge using head phone.
Exp-V	To find the impedance of LCR circuit.
Exp-VI	To evaluate the value of Planck's constant using a photo-cell.
Exp-VII	To study the characteristics of a Solar cell.
Exp-VIII	To draw the V-I characteristics of a P-N junction diode.
Exp-IX	To study the common base/ common emitter characteristics of PNP/NPN junction transistor.
Exp-X	To study the Zener diode characteristics.
Exp-XI	To find the dispersive power of a given prism using a spectrometer.
Exp-XII	To find the wavelength of monochromatic light using Newton's rings apparatus.
Exp-XIII	To determine the wavelength of sodium light using a plane transmission grating.
Exp-XIV	To determine the specific rotation of sugar/glucose using Laurent's Half shade Polarimeter.
Exp-XV	To find the wavelength of He-Ne laser.
	OF FIGHT EXPERIMENTS IS TO BE PERFORMED COVERING THE DIVERSE ASPECTS O

NOTE : A MINIMUM OF EIGHT EXPERIMENTS IS TO BE PERFORMED COVERING THE DIVERSE ASPECTS OF ENGINEERING PHYSICS.

BOOKS RECOMMENDED:

TITLE

AUTHOR

- 1. B.Sc. Practical Physics C.L. Arora
- 2.Practical PhysicsWarsnop & Flint3.Practical PhysicsChauhan & Singh (Vol. I & Vol. II)

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CLASS: B.E. 1ST SEMESTER BRANCH:COMPUTER/ELECTRICAL/E&C/IT ENGINEERING COURSE TITLE: COMPUTER PROGRAMMING COURSE No.: ESC-101 DURATION EXAM.: 3 HRS

CREDITS: 4

L T P MARKS THEORY SESSIONAL 3 1 0 100 50

Course Outcomes : At the end of the course the student will be able to -

- CO 1 Understand, analyze and implement software development tools like algorithm, pseudo codes and flow charts.
- CO 2 Understand the use of loops and decision making statements to solve the problems.
- CO 3 Apply different operations on arrays and user-defined functions to solve real-time problems.
- CO 4 Analyze the operation of pointers, structures and unions.
- CO 5 Implement file operations in C programming for a given application.

Detailed Syllabus Section-A

Introduction to Programming (Flow chart/pseudocode, compilation etc.

Evolution of programming languages, structured programming, the compilation process, object code, source code, executable code, operating systems, fundamentals of algorithms, flow charts.

Introduction to C, Data Types, Constants, Variables, Expressions, Statements, Operators, Data Input and Output.

Character set, Identifiers, Keywords, Data Types, Constant and Variables, Statements, Expressions, Operators, Precedence of operators, Input-output Assignments. (10 hrs)

Control Statements, Storage Classes, Library Functions.

Control structures, Decision making and Branching, Decision making & looping.

Storage Classes: Types of storage class, Scoping rules.

Standard Library Functions, advantages and use of various library functions (I/O functions, String, Character, Mathematics, Time and Date, functions) (10 hrs)

Section-B

Functions, Arrays, Recursion, User Defined Data Types, Structures, Unions, Passing Structure to Functions.

User defined and standard functions, Formal and Actual arguments, Functions category, function prototypes, parameter passing, Call-by-value, Call-by-reference, Nested functions.

One dimensional Array, Multidimensional Array declaration and their applications, String Manipulation, Recursion, Passing array to a function. Declaration of structures, declaration of unions, pointer to structure & unions. (10hrs)

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Pointers, Operation on Pointers, Passing Pointers to Functions, Data Files – Opening, Closing, Creating Data Files

Pointer variable and its importance, Pointer Arithmetic, passing parameters by reference, pointer to pointer, pointers to functions, Dangling pointer, dynamic memory allocation.

Console input output functions, Disk input output functions, opening closing and creating Data files. (10 hrs)

<u>NOTE:</u> There shall be total eight questions, four from each section. Five questions will have to be attempted selecting at least two from each section. Use of calculator is allowed.

BOOKS RECOMMENDED:

- 1. C How to Program, 7/e
- 2. Programming With C
- 3. Programming With C
- 4. C The Complete Reference
- 5. Let us C
- 6. Programming in C : A Practical Approach

- Paul J. Deitel
- Byron Gottfried.
- E. Balaguruswamy.
- Herbert Schildt.
- Yashwant Kanitkar.
- Ajay Mittal

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				THEORY PRACTICAL
	L	т	Ρ	MARKS
DURATION EXAM: 3 HRS				
COURSE No.: ESC-111				
COURSE TITLE: COMPUTER PROGRAMMING LAB			C	CREDIT: 1
BRANCH: COMPUTER/ELECTRICAL/E&C/IT ENGINEERING				
CLASS: B.E. 1ST SEMESTER				

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Laboratory Outcomes: After Completion of this course the student will be able to –

- CO 1 Read, understand and trace the execution of programs written in C language.
 CO 2 Exercise conditional and iterative statements to write C programs.
 CO 3 Implement Programs using operators, arrays and pointers to access functions.
- CO 4 Write programs that perform operations using derived data types and files.

Lab Experiments

Experiment 1: Problem solving using computers: Familiarization with programming Environment.

Experiment 2: Variable types and type conversions: Simple computational problems using arithmetic expressions.

Experiment 3: Branching and logical expressions: Problems involving if-then-else Structures.

Experiment 4: Loops, while and for loops: Iterative problems e.g., sum of series

Experiment 5: 1D Arrays: searching, sorting: 1D Array manipulation

Experiment 6: 2D arrays and Strings, memory structure: Matrix problems, String Operations

Experiment 7: Functions, call by value: Simple functions

Experiment 8: Recursion, structure of recursive calls: Recursive functions

Experiment 9: Pointers, structures and dynamic memory allocation: Pointers and Structures

Experiment 10: File handling: File creation, writing and reading a file, File manipulation Operations

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CLASS: B.E. 1ST SEMESTER BRANCH: ELECTRICAL/COMPUTER/E&C/ I.T ENGINEERING COURSE TITLE: ENGINEERING GRAPHICS COURSE No.: ESC-102

CREDITS: 2.5

DURATION EXAM.: 3 HRS

L	Т	Р	MARKS					
			THEORY	SESSIONAL				
1	0	3	100	50				

Course Outcomes (COs): At the end of the course the Student will be able to-

- Draw orthographic projections of sections. CO 1
- Use architectural and engineering scales with accuracy. CO 2
- Work with zeal of office practices and standards. CO 3
- Convert sketches to engineered drawing. CO₄
- CO 5 Perform auto cad two dimensional drawing.

SECTION A

Engineering Curves: Conventional lines and signs used in Engineering Drawing, Dimension and Tolerances, Printing and Lettering, Curves used in Engineering Practice: Cycloidals, Involutes, Spirals and Hellices,

Loci-Conic section: Terms used in conic-conic curves curved defined as Loci, Practical application of conics, Ellipse, Parabola, Hyperbola

Projection of Planes: Projections of a plane w.r.t. the principle planes in simple and inclined positions. Rotation method and the Auxiliary plane method. Space relation of a plane. To locate a point on a plane given its projections. Parallel relation of planes. Projection of planes inclined to different principal plane.

Projection of Solids: Classification and main features-Prisms and Pyramids. Projection of solids inclined to both the reference planes by (1) Rotation Method, and (II) Auxiliary plane method. Projection of solids in combination (Co-axial) in simple and inclined positions.

Sectioning of Solids: Object of sectioning, Types of cutting planes, True shape of section, Auxiliary views of sections of multiple co-axial solids in simple and titled conditions.

SECTION B

Interpenetration of Solids and Intersection of Surface: Intersection of geometrical solids/hollow sections, Tracing of lines of intersection by line method and by section method.

Development of Surfaces: Classification of surfaces, Methods of development-Straight line method and Radial line method, Development of solids and hollow sections in full or part development of transition pieces. To draw projections from given development.

Isometric Projection: Isometric scale, Isometric axes and Isometric planes, Isometric projection of solids and simple machine blocks.

Overview of Computer Graphics covering:

Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.

Orthographic Projections: Orthographic projection of simple blocks (First & Third angles), to draw the third view from given two views. Missing lines in projection.

Text/ Reference Books

- Engineering Drawing by P.S GILL 1.
- Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House 2.
- Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education 3.
- Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication 4.
- Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers 5. 5.
- (Corresponding set of) CAD Software Theory and User Manuals 6.

NOTE: There shall be total eight questions, four from each section. Five questions will have to be attempted selecting at least two from each section. Use of calculator is allowed.

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CLASS: B.E. 1ST SEMESTER BRANCH: COMPUTER/ELECTRICAL/E&C/IT ENGINEERING COURSE TITLE: MENTORING & PROFESSIONAL DEVELOPMENT COURSE No.: NCC-101 L T P DURATION EXAM: 3 HRS 0 0 2

Detailed Syllabus

- Mentoring: Meaning and importance of mentoring, Stress management, Conflict management, Time management .Role of mentor in: mitigating stress and conflict in time management, in confidence building, in overall personality development, in developing life skills and emotional intelligence. (7)
- Meaning and components of personality, Personality development models –Johari Window and Transactional analysis, Motivation – meaning and approaches, Leadership –meaning and style.
- **Note:** i. There shall be a case study, viva –voce of the students by internal examiner consisting of 40 marks each.
 - ii. There will be an Internal MCQ/Objective type Questions based examination of 40 marks.
 - iii. Evaluation: Satisfactory>= 40%: Unsatisfactory<40%.

CLASS: B.E. 1ST SEMESTER

BRANCH: COMPUTER/ELECTRICAL/E&C/IT ENGINEERING

COURSE TITLE: ENVIRONMI	ENTAL SCIENCE	S			CREDIT: Non-Credit
COURSE No.: NCC-102			L	Т	Р
DURATION EXAM: 3 HRS			0	0	2

Detailed Syllabus

- Introduction
 Definition and scope and importance of multidisciplinary nature of environment. Need for public awareness.
 (2)
- 2. Natural Resources

Natural Resources and associated problems, use and over exploitation. (2)

3. Ecosystems

Concept of Ecosystem, Structure, interrelationship, producers, consumers and decomposers, biodiversity and importance. (2)

4. Environmental Pollution

Definition, Causes, effects and control measures of air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution, nuclear hazards. Solid waste Management: Causes, effects and control measure of urban and industrial wastes. Disaster Management: Floods, earthquake, cyclone and landslides. (4)

5. Social Issues

Water conservation, rain water harvesting, Climate change, global warming, acid rain. Environment Protection Act: Air (Prevention and Control of Pollution) Act, Water (Prevention and control of pollution) Act, Wildlife Protection Act, Forest Conservation Act. (3)

6. Human Population and the Environment

Population growth, Population explosion. Environment and human health, Human Rights. Role of Information Technology in Environment and human health. (2)

Note:

- i. There will be an Internal MCQ/Objective type Questions based examination of 40 marks.
- ii. Evaluation: Satisfactory>= 40%: Unsatisfactory<40%.

iii. A field visit of students to make them aware about the environmental issues is compulsory.

BOOKS RECOMMENDED:

1.	Environmental Sciences	- Basak, A
2.	Environmental Studies	- Benny Joseph
3.	Environment Pollution Control Engineering	- Rao, C.S.
4.	Perspectives in Environmental Studies	- Kaushik, A.
5.	Elements of Environment Science & Engineering	- Meenakshi.
6	Elements of Environment Engineering	- Duggal.

CLASS: B.E. 1ST SEMESTER BRANCH: COMPUTER/ELECTRICAL/E&C/IT ENGINEERING COURSE TITLE: INDIAN CONSTITUTION CREDIT: Non-Credit COURSE No.: NCC-103 L T P DURATION EXAM: 3 HRS 0 0 2

Detailed Syllabus

1.	Indian Constitution-Sources and Features, Preamble	(2)
2.	Fundamental Rights, Fundamental Duties	(2)
3.	Directive Principles of state policy	(2)
4.	Structure of State and Central Government	(4)

5. Judiciary-Supreme court, High court, Judicial Review and Judicial Activism (5)

Note:

i. There will be an Internal MCQ/Objective type Questions based examination of 40 marks.

ii. Evaluation: Satisfactory>= 40%: Unsatisfactory<40%.

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B.E. E&C Engineering Second Semester Examination to be held in the Year May 2019,2020,2021,2022

B.E. E&C Engineering 2nd Semester

Contact Hrs.: 26

COURSE	COURSE	COURSE TITLE				MARKS DISTRIBUTION		TOTAL MARKS	L CREDITS	% Change
CODE	ITPE		L	T	P	INTERNAL	EXTERNAL			
BSC-201	Basic Science Course	Engineering Mathematics-II	3	2	-	50	100	150	5	100
BSC-203	Basic Science Course	Engineering Chemistry	3	1	-	50	100	150	4	100
ESC-203	Engineering Science Course	Basic Electrical Engineering	3	1	0	50	100	150	4	100
HMC-201	Humanities & Social Science & Management Courses	Communication Skill	2	-	-	25	50	75	2	100
BSC-213	Basic Science Course	Engineering Chemistry (Lab)	-	-	3	50	-	50	1.5	100
ESC-213	Engineering Science Course	Basic Electrical Engineering (Lab)	-	-	2	50		50	1	100
HMC-211	Humanities & Social Science & Management Courses	Communication Skill (Lab)	-	-	2	25	-	25	1	100
ESC-214	Engineering Science Course	Workshop Technology	1	-	3	50	-	50	2.5	100
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Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER					
BRANCH: COMMON TO ALL BRANCHES					
COURSE TITLE: ENGINEERING MATHEMATICS-II			С	REDITS: 5	
COURSE No.: BSC-201					
DURATION EXAM.: 3 HRS					
	L	т	Р	MARKS	
				THEORY	SESSIONAL
	3	2	0	100	50

Course Outcomes: At the end of the course the Student will be able to

- Learn the rules of nth derivative, to find maximum and minimum value of any function, to trace the curves. CO₁
- Understand the concept of definite integrals and find arc length, area, surface area and volume of various CO 2 curves.
- Solve the differential equations of first order and higher order. CO 3
- differentiate the concept of scalars, vectors, gradient, divergence and curl. CO4
- Evaluate the complex no. in polar form and understand the idea of hyperbolic functions CO 5

Detailed Syllabus

UNIT-1 Introduction to infinite series & sequences

Convergence and divergence of a series, p-test, comparison test, Cauchy's root test, D' Alembert Ratio Test, Raabe's Test, Guass test, Logarithmic test, Leibnitz test on alternating series.

UNIT- II Fourier series and Power Series Solutions of Second order O.d.e

- Fourier series: Euler's formula, sufficient conditions for a Fourier expansion, functions having points of (i) discontinuity, change of intervals. Odd and even functions, Fourier expansion of Odd and even periodic functions, half range series, typical wave forms, Parseval's formula, complex form of Fourier -series.
- Power series: Analytic function, ordinary point, singular point, regular and irregular singular points of (ii)Y" +P(x) Y' + Q(x) Y=0, Series solution of differential equations about an ordinary point, o.d.e. Frobenius series solution about a regular singular point. Examples of Legendre and Bessel's differential equations.

Unit - III First Order partial differential equations

Formation of p.d.e, First order linear p.d.e, Non-Linear p.d.e. of 1st order, solution by Charpit's method, Four Standard forms of non-linear p.d.e with reference to Charpit's technique: f (p,q) = 0 , f (z,p,q) = 0 , f (x,p) = g (y,q) and Clauraut's form.

Unit – IV Higher Order Linear p.d.e

Homogenous and Non-homogenous higher order linear partial differential with constant coefficients Rules for finding P.I and C.F, Non-Linear equations of 2nd order. Application of p.d.e, method of separation of variables to solve equations of vibrations of strings (or one dim wave equation), one dim heat flow equations, Laplace equations.

Unit - V Matrices

Introduction, Rank of matrix, Elementary transformations, Elementary matrices, Inverse using elementary transformation, Normal form of a matrix, Linear dependence and independence of vectors, consistency of linear system of equations, Guass Jordan method, Gauss elimination method, Eigen values and Eigen vector, Properties of Eigen value, Cayley Hamilton Theorem, Reduction to diagonal form, Reduction of quadratic form to canonical form.

(07 hrs)

(08 hrs)

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(06 hrs)

(10 hrs)

(05 hrs)

Unit – VI Vector Spaces

- **NOTE: (I)** There shall be total seven questions. Question no.1 is compulsory and short answer/ objective type. It will consist of 10 questions each of 1 mark (Total: 10 marks)
 - (II) There will be two questions from each unit. Attempt one question from each unit. Each question carry 15 marks.

BOOKS RECOMMENDED:

- 1. Advanced Engineering Mathematics
- 2. Higher Engineering Mathematics
- 3. Engineering Mathematics -II
- 4. Partial differential equations
- 5. Linear Algebra

E. Kreyszig, 2006 Dr. B.S. Grewal, Khanna Publication, New Delhi Dr. Bhopinder Singh M.D.RaiSinghania D.Poole,2nd Edition, 2005

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Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER BRANCH:COMPUTER/E&C/I.T ENGINEERING COURSE TITLE: ENGINEERING CHEMISTRY COURSE No.: BSC-203 DURATION EXAM.: 3 HRS

CREDITS: 4

L	т	Ρ	M.	ARKS
			THEORY	SESSIONAL
3	1	0	100	50

Course Outcomes : At the end of the course the student will be able to -

- **CO1** Know the importance of stereochemistry in organic compound and apply the knowledge gain in this course to the variety of chemical compounds.
- **CO 2** Summarize the chemical structure, molecular properties, vulcanization process and application of major type of rubber.
- CO 3 The different polymerisation processes used to make thermoplastic and thermosetting plastics.
- **CO 4** Through Spectroscopy, One could acquire Knowledge about the identification of newly synthesized products.
- CO 5 Explain the air quality, emission, pollution control and Environmental health.
- CO 6 Define basic knowledge on cement, its production, characteristics, properties etc.
- CO 7 Recognise the common physical, chemical process encountered in treatment process of water.

SECTION - A

Module – I

STEREOCHEMISTRY AND DRUGS

Optical isomerism, enantiomerism and diastereoisomerism, racemisation, Methods for resolution of racemic mixture, asymmetric synthesis.

Definition and synthesis of a drug, structure and applications of following drugs:-

- (e) Antipyretic
- (f) Narcotics
- (g) Tranquilizers
- (h) Antibiotics

Module - II

PLASTICS, RUBBER AND PAINTS

Plastics : Introduction, importance and uses of plastics, classification of plastics, moulding constituents of a plastic, moulding of plastic into articles (compression, injection, transfer and extraction mouldings).

Introduction, types of rubber, treatment of latex, vulcanization of rubber. Rubber :

Paints : Introduction, requisites of a good paint, constituents of a paint, manufacture of paint, a brief idea of manufacture, properties and uses of white pigments such as white lead and lithopone

9hrs

Gu

6hrs

Module – III SPECTROSCOPIC TECHNIQUES AND APPLICATIONS

UV Spectroscopy : Principle, Laws of absorption, Band nature of UV Spectrum, types of electronic transitions, applications.
 I R Spectroscopy : Principle, molecular vibrations, applications.
 NMR Spectroscope : Principle and applications.

8hrs

8hrs

SECTION - B

Module – IV ENVIRONMENTAL SCIENCE

Concepts of Environmental Chemistry, Segments of environment (a brief idea about atmosphere, hydrosphere and Lithosphere).

Air Pollution : Types and control of Air Pollution.

Water Pollution: Classification and control of Water Pollution.

Chemical Toxicology :Biochemical effects of Pb, Hg, As, Zn & CN.

Module – V

ALLOYS AND CEMENT

Alloys : Introduction, purpose of making alloys, preparation of alloys, classification of alloys (Ferrous & Non-Ferrous alloys), alloy steels and copper alloys (Brass & Bronze).

Cement & its types, manufacture of Portland cement, setting and hardening of cement. 5hrs Module – VI

WATER TREATMENT

Introduction, softening of water by Lime-Soda, zeolite & ion-exchange processes, priming and foaming, sludge & scale formation, determination of hardness of water by EDTA method, Numericals on hardness and softening of water.

6hrs

NOTE: The paper will be divided into two sections. There shall be a total of eight questions, four from each section A and B, selecting at least one question from each module. Each question carries 20 marks. Five questions will have to be attempted, selecting at least two questions from each section. Use of calculator is allowed.

Books Recommended:

- S.No. BOOKS RECOMMENDED
 - 1. Engineering Chemistry
 - 2. Engineering Chemistry
 - 3. Engineering Chemistry
 - 4. Engineering Chemistry
 - 5. Organic Chemistry
 - 6. Environmental Chemistry
 - 7. Spectroscopy of Organic Compounds
 - 8. Spectroscopy of Organic Compounds
 - 9. Polymer Science
 - 10. Engineering Chemistry

AUTHOR Jain & Jain Sharma, B.K. Dara, S.S. Shashi, Chawla Bahl, B.S. De, A.K. Silverstein Kalsi, P.S. Gowrikar, V.R. etal Dr. Rajinder Kumar

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Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER BRANCH: COMPUTER/E&C/I.T ENGINEERING COURSE TITLE: ENGINEERING CHEMISTRY LAB COURSE No.: BSC-213 DURATION EXAM.: 3 HRS

CREDITS: 1.5

L T P MARKS THEORY PRACTICAL 0 0 3 0 50

Course Outcomes : At the end of the course the student will be able to -

- CO 1 Capability to visualize and understand chemical engineering unit, operations related to fluid and practical mechanics and mass transfer.
- CO 2 To provide an overview of preparation and identification of organic compound.
- CO 3 This course relies on quantitative analysis and makes use of simple equation to illustrate the concept involved.
- CO 4 Handling different types of instruments for analysis of materials, using small quantity of material involved for quick and accurate results.
- CO 5 Estimation of total hardness of water by EDTA complex metric method.
- CO 6 Detection of various elements and functional groups in unknown organic compound.
- CO 7 To determine the alkali content in antacid tablets.

S. No.	TITLE OF EXPERIMENT
1.	Determine the percentage of CaCO ₃ in precipitated chalk. You are provided
	with IN HCI and 0.IN NaOH.
2.	To analyse the given antacid tablets.
3.	Determine Volumetrically the number of molecules of water of crystallization
	present in the given sample of Mohr's salt, x gms. of which have been
	dissolved per litre provided N/10 $K_2Cr_2O_7$ (using an external indicator).
4.	Determine Volumetrically the percentage of Cu in a sample of CuSO ₄ crystals,
	Z gms of which have been dissolved per litre, provided 0.IN
89. B. B.	$Na_2S_2 O_3.$
5.	To determine the coefficient of viscosity of an unknown liquid using Ostwald
	Viscometer.
6.	Determine the surface tension of a unknown liquid Stalagmometer.
7.	To prepare a pure and dry sample of Aspirin.
8.	To prepare a pure and dry sample of Glucosazone.
9.	Determine the method of purification of organic compounds by coloumn
	chromatography.
10.	Organic Analysis: Identify the following organic compounds (preparation of at
	least one derivative).
11.	Determine the total hardness of a sample of water by complexometric
	method (using EDTA).
12	Determine the percentage of calcium oxide in cement.

Note:- A minimum of ten experiments to be performed.

BOOKS RECOMMENDED:-

- TITLE
- 1. A manual of practical Engineering Chemistry
- 2. Experimental Engineering chemistry

AUTHOR (Dr. Rajinder Kumar) (Shashi Chawla)

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Second Semester Examination to be held in the Year May 2019,2020,2021,2022 CLASS: B.E. 2ND SEMESTER

BRANCH: COMPUTER/E&C/ELECTRICAL/I.T ENGINEERING

COURSE TITLE: BASIC ELECTRICAL ENGINEERING

CREDITS: 4

COURSE No.: ESC-203

DURATION EXAM.: 3 HRS

L	т	Ρ	M	ARKS
			THEORY	SESSIONAL
3	1	0	100	50

Course Outcomes:

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

To understand and analyse basic electric and magnetic circuits.

- To study the working principles of electrical machines.
- To introduce the components of low-voltage electrical installations. .

Section-A

Module 1: DC Circuits

Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws, analysis of simple circuits with dc excitation. Mesh and Nodal analysis, Superposition, Maximum Power Transfer theorem, Thevenin and Norton Theorems.

Module 2: AC Circuits

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel) and resonance. (6 hours)

Module 3: Three-phase Circuits

Concept of three phase voltage, voltage and current relations in star and delta connections. Measurement of power in three-phase balanced circuits.

Section-B

Module 4: Transformers

Principle of operation, ideal and practical transformer(no-load & on-load pahsor diagrams), equivalent circuit, losses in transformers, Transformer test (open circuit & short circuit), regulation and efficiency. (8 hours)

Module 5: Electrical Machines

DC Machines- Principle of operation, emf equation, torque production. AC Machines- Three-phase induction motor, principle of operation, slip and rotor frequency. Synchronous machines- Principle of operation and emf equation.

Module 6: Electrical Installations

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

Text / References:

- 1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill.
- 2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill.
- 3. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press.
- 4. E. Hughes, "Electrical and Electronics Technology", Pearson.
- 5. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India.

1. The question paper shall comprise of total eight questions, four from each section and atleast NOTE: one question from each module.

2. Students are required to attempt five questions selecting at least two questions from each section. Use of scientific calculator is allowed.

(6 hours)

(6 hours)

Guy

(8 hours)

(8 hours)

Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER

BRANCH: COMPUTER/E&C/ELECTRICAL/I.T ENGINEERING

COURSE TITLE: BASIC ELECTRICAL ENGINEERING LAB

COURSE No.: ESC-213

DURATION EXAM.: 3 HRS

1	L	Т	Р	MARKS				
				THEORY	PRACTICAL			
(D	0	2	0	50			

CREDIT: 1

Laboratory Outcomes: The students are expected to

- Get an exposure to common electrical components and their ratings.
- Make electrical connections by wires of appropriate ratings. .
- Understand the usage of common electrical measuring instruments.
- Understand the basic characteristics of transformers and electrical machines.

List of Laboratory Experiments/Demonstrations:

- 1. Basic safety precautions. Introduction and use of measuring instruments voltmeter, Ammeter, multi-meter, oscilloscope. Components-Resistors, capacitors and inductors.
- 2. Verification of Kirchoff's Laws.
- 3. Verification of Superposition Theorem.
- 4. Verification of Thevenin's Theorem.
- 5. Verification of Norton Theorem.
- 6. Verification of Maximum Power Transfer Theorem.
- 7. Measurement of current in various branches of RLC series-parallel circuit.
- 8. Measurement of three-phase power using Wattmeter.
- 9. Study of single phase transformers. Determination of Polarity Test of given single phase transformer.
- 10. To perform open and short circuit test on single phase transformer.
- 11. Demonstration of cut-out sections of machines: dc machine and ac machines.
- 12. Study of wires, cables, fuses and MCBs.
- 13. To perform calculations for energy consumption. Note: A minimum of eight experiments is to performed by each student

Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER

BRANCH: COMPUTER/ELECTRICAL/E&C/IT ENGINEERING

COURSE TITLE: COMMUNICATION SKILLS

COURSE No.: HMC-201

DURATION EXAM: 3 HRS

COURSE OUTCOME OF COMMUNICATION SKILLS

The student would be able to:

- 1. Acquire proficiency in reading, speaking and writing skills.
- 2. Equip themselves with grammatical and communicative competence.
- 3. Adept in communication skills required for the competence in present scenario.
- 4. Acquire proficiency in listening skills and professional etiquettes.
- 5. Enhance their linguistic competence for Group Discussions and public speaking.

SECTION-A

UNIT I

Writing Practice: Comprehension, Notices, Mcmos, Précis writing, Types of Letter- Enquiry letter, Reply to enquiry, Claims letter, Adjustment and sales letter, Job letter; E-mail writing. 5 hrs

UNIT II

Introduction to grammar: Use of phrase and clauses in sentences, use of proper punctuationConcept of word formation, Synonyms, Antonyms, Prefix, Suffix; Articles, Prepositions, Clichés, Subject-verb 6 hrs Agreement.

SECTION-B

UNITIII

Communication: Introduction, Elements of Business Communication, Media of verbal communication (oral & written), Barriers of Communication, Guidelines to improve Business communication. 5 hrs

UNIT IV

Professional Etiquettes- Meaning and types. Listening skills: Process of listening, types of listening, techniques to improve listening ability, skills of effective listening, Group Discussion-Advantages, Purpose, Group Dynamics, and Guidelines for Effective Group discussion.

UNIT V

Speaking Skills- Skills of Effective speaking, Components of Effective talk and body language; Interviews-Meaning, Types of interview, tips for giving an interview and handling questions. Meeting skills: purpose of meeting- procedures, notices, agenda, venue of meeting; minutes of meeting. Brain Storming-Purpose and techniques.

NOTE: The question paper shall consist of two questions from each unit (total 10 questions). Students have to attempt one question from each unit (total no. of questions to be attempted shall be five) i.e there shall be internal choice within each unit. Students have to attempt two questions from Section A and three questions from section B. Each question carries equal marks (10 marks).

CREDITS: 2

THEORY

50

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2

MARKS

SESSIONAL

25

5 hrs

5 hrs

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BOOKS RECOMMENDED

- Communication Skills by Dr. Nageshwar Rao & Dr. Rajendra Prasad.
- Functional Aspects of Communication Skills by Dr. Prajapati Prasad, Published by S.K Kataria &Sons.
- An Approach to Communication Skills by Indrajit Bhattacharya, Published by Dhanpat Rai & Co. Ltd.
- Communication Skills by Varinder Kumar and Bodh Raj, Published by Kalyani Publishers.
- An Approach to Communication Skills by Bhanu Ranjan
- Communication Skills and Functional Grammar by Sadhna Gupta.
- Remedial English Grammar by F.T.Wood. Macmillan
- On Writing Well. William Zinsser. Harper resource Book

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Second Semester Examination to be held in the Year May 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER

BRANCH: COMPUTER/ELECTRICAL/E&C/IT ENGINEERING

COURSE TITLE: COMMUNICATION SKILLS

CREDIT: 1

COURSE No.: HMC-211

DURATION EXAM: 3 HRS

L	Т	Ρ	MARKS				
			THEORY	PRACTICAL			
· 0	0	2	0	25			

COURSE OUTCOME OF COMMUNICATION SKILLS LAB

The student would be able to:

- 1. Identify difficult sounds, words and phrases and shall acquire proficiency in pronouncing the words correctly with proper stress and intonations.
- 2. Equip themselves with art of making resume/cv which can aptly highlight their self-introduction and their strongest attributes.
- 3. Make use of latest technology to communicate effectively in various settings and contexts.
- 4. Face their interviews confidently and shall acquire proficiency in Group Discussions and public speaking.
- 5. Acquire the art of holding meetings as well as preparing the annual reports of the organizations.

List of Practical:

- 1. Listening Comprehension.
- 2. Pronunciation, Intonation, Stress & Rhythm.
- 3. Common everyday situations and conversations & Dialogues.
- 4. Power point presentation
- 5. Resume/Bio data preparation including SWOT analysis.
- 6. Vocabulary improvement programs, Role play
- 7. Mock interviews
- 8. Group discussions
- 9. Minutes of Meeting
- 10. Annual Reports

by

Second Semester Examination to be held in the Year December 2019,2020,2021,2022

CLASS: B.E. 2ND SEMESTER BRANCH: CIVIL/MECHANICAL ENGINEERING COURSE TITLE: WORKSHOP TECHNOLOGY COURSE No.: ESC-214 DURATION EXAM: 3 HRS

CREDITS: 2.5

Т	Р	M	ARKS
		THEORY	PRACTICAL
0	3	0	50
	Т 0	T P 0 3	T P M. THEORY 0 3 0

Course Outcomes:-

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

- CO 1 Understanding different manufacturing techniques and their relative Advantages/disadvantages with respect to different applications.
- CO 2 Selection of a suitable technique for meeting a specific fabrication need.
- CO 3 Acquire a minimum practical skill with respect to the different manufacturing methods and develop the confidence to design& fabricate small components for their project work and also to participate in various national and international technical competitions.
- CO 4 Introduction to different manufacturing methods in different fields of engineering.
- CO 5 Practical exposure to different fabrication techniques
- CO 6 Creation of simple components using different materials. Exposure to some of the advanced and latest manufacturing techniques being employed in the industry.

Shop Practice :-

Unit I CARPENTRY:-

1. Different joints :- a) Middle/cross lap joint

b) Mortise and Tenon T -joint

2. Pattern making of open bearing

Unit II CASTING:-

- 1. Casting of open bearing (single piece pattern)
- 2. Casting of split piece pattern

Unit III SMITHY:-

- 1. Cubical block from a cylindrical section
- 2. L shaped hook from cylindrical section

Unit IV WELDING:-

- 1. Preparation of single V Butt joint by gas and arc welding processes
- 2. Preparation of Double V-Butt joint, T-joint and corner joint by gas and arc welding

Unit V FITTING:-

- 1. Assembly of snap fitting of MS-Flat picccs (Male and Female)
- 2. Assembly and fitting of two L- shaped rectangular MS flat pieces

Unit VI MACHINE SHOP:-

- 1. Operation like turning, step turning on MS round
- 2. Operation like taper turning, Knurling on MS round
- 3. Introduction to CNC machines

Books Recommended:-

- Workshop Technology by Hajra and Chowdhary
- Manufacturing Technology Vol 1 & II by Rao. P.N
- Manufacturing Technology by Gowri .P. Hariharan and A. Suresh Babu

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UNIVERSITY OF JAMMU

NOTIFICATION (19/Aug/Adp/32)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Competent Bodies, has been pleased to authorize the adoption of revised Syllabus of Bachelor of Engineering (Electronics & Communication Engineering) for Semester III & IV under the Choice Based Credit System as per the model curriculum of the AICTE (as given in the Annexure) for the candidates of all (Govt./Pvt./UIET) Engineering Colleges affiliated with the University of Jammu for the Examinations to be held in the years indicated against each Semester as under :-

Branch E&C Semester Semester-III Semester-IV For the Examination to be held in the years December 2019, 2020, 2021 and 2022 May 2020, 2021, 2022 and 2023

The Syllabi of the course is available on the University Website: www.jammuuniversity.in.

Sd/-DEAN ACADEMIC AFFAIRS

No. F.Acd/III/19/4805-48/6 Dated:20/08/2019

Copy for information & necessary action to:-1. Dean Faculty of Engineering

- 2. Principal, GCET/MIET/MBSCET/UIET/BCET/YCET
- 3. C.A to the Controller of Examinations
- 4. Assistant Registrar (Exams/Confidential)
- 5. Section Officer (Confidential)
- 6. Incharge University Website

Assistant Registrar (Academics)

ANNEXURE- I

B.E. Electronics & Communication Engineering 3rd Semester Examination to be held in the Year December 2019, 2020, 2021, 2022

B.E. Electronics & Communication Engineering 3rd Semester

Contact Hrs: 26

Course Code	COURSE TYPE	Course Title	ALI	LOAD LOCAT	ION	Marks Di	MARKS DISTRIBUTION		CREDITS	%CHANGE
CODE			L	Т	P	INTERNAL	EXTERNAL			
PEC-301	Professional Core Courses	Electronic Devices & Circuits- I	3	1	0	50	100	150	4	100%
PEC-302	Professional Core Courses	Digital Electronics	3	1	0	50	100	150	4	100%
EEE-302	Engineering Science Course	Network Theory	3	0	0	50	100	150	3	100%
HMC-301	Humanities & Social Science & Management Courses	Entrepreneur- ship and Business Strategies	3	0	0	50	100	150	3	100%
BSC-301	Basic Science Course	Numerical Methods &Transform Calculus	3	1	0	50	100	150	4	100%
PEC-311	Professional Core Courses	Electronic Devices Lab	0	0	2	75		75	1	100%
PEC-312	Professional Core Courses	Digital Electronics Lab	0	0	2	75		75	1	100%
PEC-313	Professional Core Courses	Electronics Workshop	0	0	2	50		50	1	100%
PEC-303	Professional	Mini Project	0	0	2	50		50	1	1000/
MOC-301	Core Courses	MOOCs	0	U	2	30		30	1	100%
TOTAL				3	8	500	500	1000	22	

CLASS: B.E. 3RD SEMESTER **CREDITS: 4 BRANCH: ELECTRONICS & COMMUNICATION ENGG. COURSE NO: PEC-301** Marks **COURSE TITLE: ELECTRONIC DEVICES AND** Т Р \mathbf{L} Theory Sessional **CIRCUITS-I** 3 1 0 100 50 **DURATION OF EXAM: 3 HOURS** COUDSE OUTCOMES

	<u>COURSE OUTCOMES</u>							
At the	end of the course student will be able to:							
CO1	Understand the operation of semiconductor devices, rectifiers, concept of noise removal using filters							
	and their applications.							
CO2	Apply the concepts of different types of transistors, its biasing conditions to evaluate load lines and							
	operating point parameters.							
CO3	Analyze the frequency response and different coupling methods of multistage amplifiers.							
CO4	Design different configurations of transistor using hybrid models.							

Detailed Syllabus

Section-A

Semiconductor Diodes: Introduction, PN junction biasing conditions, Volt-ampere characteristics, breakdown mechanism(Avalanche, Zener breakdown), Zener diode, Tunnel diode, Schottky diode, LED, photodiode, Varactor diode, PN junction diode as rectifiers, filters, clippers and clampers. (10 hours)

Transistors: Working principle, generalized transistor equation, transistor configurations (CE,CC,CB) and characteristics, early effect, Need for biasing, types of biasing circuit, load line concept (AC/DC), Bias stabilization, Introduction to JFET, characteristics, symbol and operation, Biasing of FET with necessary derivations, MOSFET (depletion and enhancement). (11 hours)

Section-B

Single and Multistage Amplifiers: Need for cascading, Techniques for improving input resistance (Darlington transistor, Bootstrap emitter follower amplifiers), method of coupling multistage amplifiers (RC coupling, DC coupling, transformer coupling), Frequency response of amplifiers, Effect of emitter and bypass capacitors on the bandwidth and frequency response of a cascaded amplifiers. (11hours)

Hybrid Parameters: Introduction. Two port network, hybrid model for CE,CC,CB configuration and their analysis using h-parameters, Miller theorem, Introduction to hybrid pie-model, relationship between h-parameters and hybrid pie-parameters, Current Gain with and without resistive load, single stage CE transistor amplifiers response. (09 hours)

RECOMMENDED BOOKS:

1.	Integrated Electronics	Millman Halkias
2.	Electronics Devices	Bolystead
3.	Electronics Devices	Malvino Leach
4.	Microelectronics Circuits	Adel S. Sedra

NOTE: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions have to be attempted, selecting at least two from each section. Use of calculator is allowed.

CLASS: B.E. 3 RD SEMESTER BRANCH: ELECTRONICS & COMMUNICATION ENGG.				EDIT	'S:4				
COURSE NO: PEC-302					Ma	arks			
COURSE TITLE: DIGITAL ELECTRONICS			Т	Р	Theory	Sessional			
DURATION OF EXAM: 3 HOURS			1	0	100	50			
	COURSE OUTCOMES								
At the	end of the course student will be able to:								
CO1	Understand and examine various number systems to be used in digital design.								

CO2	Minimize the expressions using Karnaugh map and Quine Mc-Clusky method and implement them
	using Logic Gates in different logic families.
CO3	Analyze and design various combinational and sequential circuits.

CO4 Formulate problems and simplify with state minimizing techniques.

Detailed Syllabus

Section-A

Number System, Radix conversion, Arithmetic with base other than ten, Binary codes ó weighted/Non weighted
codes, alphanumeric code, Subtraction of signed/unsigned number.(8 hours)Logic Gates, Boolean algebra, Simplification of Boolean expressions, Minimization techniques, Karnaugh map
(up to five variables), Quine Mc-Clusky method, Simplification of Logic families ó RTL, DTL, TTL, ECL &
MOS families and their characteristics.(10 hours)

Section-B

Combinational logic circuits: Half and Full Adders, Subtractors, BCD Adder, Comparators, Multiplexer, Realization of function using MUX, Demultiplexer, Decoder, Encoder, Priority encoders, Code converters, General problems, PLA, Design of combinational circuit using PLA & PAL. (9 hours)

Introduction to sequential logic circuits, Synchronous and Asynchronous operation, Flip-Flopsó R-S, J-K, D, T
& Master-Slave flip-flop, Conversion of flip-flops, Shift registers.(8 hours)Analysis of asynchronous & synchronous sequential counter, Design of sequential logic circuits, Problem
formulations, State minimization techniques.(6 hours)

RECOMMENDED BOOKS:

- 01. Digital Electronics
- 02. Digital Electronics & Microcomputer
- 03. Computer System Architecture
- 04. Digital Electronics

By R.P Jain By R.K. Gaur By M.M. Mano By Jamini & K.M. Backward

NOTE: There shallbe total eight questions, four from each section. Each question carries 20 marks. Five questions have to be attempted, selecting at least two from each section. Use of calculator is allowed.

CLASS: B.E. 3 RD SEMESTER				CREDIT	S: 3
BRANCH: ELECTRONICS & COMMUNICATION ENGG.					
COURSE NO: EEE-302				Μ	arks
COURSE TITLE: NETWORK THEORY	\mathbf{L}	Т	Р	Theory	Sessional
DURATION OF EXAM: 3 HOURS	3	0	0	100	50

COURSE OUTCOMES:						
At the end	At the end of the course student will be able to:					
CO1	Apply the knowledge of basic circuital law, dot convention and topological description of					
	Electrical networks.					
CO2	Acquire knowledge about the application of differential equation method and Laplace transform in					
	electrical circuits.					
CO3	Understand pole-zero configuration and determine parameters of two port network.					
CO4	Understand concept and design of filters and synthesize circuits using Foster and Cauer forms.					

Detailed Syllabus

Section-A

Conventions for describing networks: Reference directions for currents and voltages, Conventions for Magnetically Coupled Circuits, Circuit Topology. (5 hours)

First order differential equation & Laplace Transformations: Differential equations as applied in solving networks, Application of initial conditions, evaluating initial conditions in networks. Laplace Transformation: Initial and final value theorems, convolution integral, convolution as summation, Solution of network problems with Laplace transformation. (7 hours)

Network Functions-poles and zeroes: Ports or terminal pairs, Network functions for one port and two port networks, Poles and Zeros of network functions, Restriction on pole and Zero locations for driving point and transfer functions. Time domain behaviour from pole-Zero plot. (7 hours)

Section-B

Two port parameters: Impedance, Admittance, transmission and hybrid parameters, Relationship between parameter sets, parallel, series & Cascade connection of two port Networks, Characteristics impedance of two port networks. (7 hours)

Filters: Filter fundamentals, filter classification, Constant K & m Derived Filters, Design of filters. (6 hours)

Network Synthesis: Synthesis problem formulation, properties of positive real functions. Hurwitz polynomials properties of RC, LC and RL driving point, functions. Foster and Cauer synthesis of LC, RL and RC circuits

(6 hours)

RECOM	IMENDED BOOKS:	
1.	Network Analysis	Van Valkenberg
2.	Network Analysis & Synthesis	F.F. Kuo
3.	Introduction to Circuit Synthesis & Design	Temes & La Patra
4.	Fundamentals of Network Analysis & Synthesis	Perikari
5.	Network Theory & Filter Design	V. Atre
6.	Network analysis and Synthesis	Sudhakar Shyam Mohan

NOTE: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions have to be attempted, selecting at least two from each section. Use of calculator is

allowed.

3rd Semester Examination to be held in the Year December 2019, 2020, 2021, 2022

CLASS: B.E. 3 RD SEMESTER					
BRANCH: ELECTRONICS & COMMUNICATION ENGG.			(CREDITS:	3
COURSE NO: HMC-301					_
COURSE TITLE: ENTREPRENEURSHIP AND				Μ	arks
BUSINESS STRATEGIES	L	Т	Р	Theory	Sessional
DURATION OF EXAM: 3 HOURS	3	0	0	100	50

A T	COURSE OUTCOMES					
At the	At the end of the course student will be able to:					
CO1	Understand in detail entrepreneurial skills and hence may opt entrepreneurship as a career option.					
CO2	Understand women/social entrepreneur & legal forms of industrial ownership.					
CO3	Apply proper knowledge about lean startups, business pitching, project initiation, execution and implementation.					
CO4	Start their own SSI unit with adequate knowledge of schemes and policies for entrepreneurship development.					

Detailed Syllabus

Section-A

Entrepreneurship: Definition and Types of entrepreneurs; Qualities of an entrepreneur; factors affecting entrepreneurship; Role of an entrepreneur in economic development; Difference between entrepreneur and manager; Barriers to entrepreneurship. (6 hours)

New Generations of Entrepreneurship: Women Entrepreneur: Classification of Women Entrepreneur inIndia, Problems of Women Entrepreneur, steps for promoting women entrepreneurship; Social Entrepreneur:Problemsandstepsforpromotingsocialentrepreneurship.(6 hours)

Legal Forms of Industrial Ownership: Sole Proprietorship, Partnership, Joint Stock Company (Features, Merits and Demerits); Introduction to business models (5 hours)

Section-B

Lean Startups: Introduction to lean startups, Business pitching: Definition, types and importance. (5 hours) Starting a New project/ Venture: Scanning the environment, product development and selection, project report preparation, project resourcing, project planning and scheduling using networking techniques of PERT/CPM(concepts only). (7 hours)

Small Scale Industries and policies for entrepreneurship development: Definition of small scale industries; objectives. Role of SSI in economic Development of India. SSI registration, NOC from pollution Board; Machinery and equipment selection; Schemes and Policies for entrepreneurship development. (6 hours)

RECOMMENDED BOOKS:

- 1. Fundamentals of Entrepreneurship, H. Nandan.
- 2. Alexander Osterwalder & Yves Pigneur, Business model generation
- 3. Small scale industries and Entrepreneurship, Vasant Desai.
- 4. Management of small scale Industries; Vasant Desai.
- 5. Entrepreneurial Development, S S Khanka
- 6. Entrepreneur Revolution: How to Develop your Entrepreneurial Mindset and Start a Business that works, Daniel Priestley

NOTE: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions have to be attempted, selecting at least two from each section. Use of calculator is allowed.

CLASS: B.E. 3 RD SEMESTER	CREDITS: 4				
BRANCH: ELECTRONICS & COMMUNICATION ENGG.					
COURSE NO: BSC-301				Μ	larks
COURSE TITLE: NUMERICAL METHODS AND	L	Т	Р	Theory	Sessional
TRANSFORM CALCULUS	3	1	0	100 [°]	50
DURATION OF EXAM: 3 HOURS					

COURSE OUTCOMES					
At the	At the end of the course student will be able to:				
CO1	Learn the basics of Operators, their types and interpolation.				
CO2	Find out the exact real root of algebraic and transcendental equations.				
CO3	Learn the concept of Laplace Transform, inverse Laplace transform of various function and its				
	applications.				
CO4	Understand the idea of Fourier transform, Fourier sine and cosine transform and their property.				

Detailed Syllabus

Section-A

NUMERICAL METHODS: Definition of operators, Finite and divided difference, Interpolation using Newton¢s and Lagrange¢s formulas. Numerical differentiation, numerical integration: Trapezoidal rule and Simpson¢s 1/3rd rule. Numerical solutions of algebraic and Transcendental equations by Regula Falsi, Newton-Raphson and direct iterative methods, solution of differential equations by Taylor¢s method, Picard¢s method, Euler and modified Euler¢s methods. RungeKutta method of fourth order for solving first and second order equations. (20 hours)

Section-B

LAPLACE TRANSFORM: Laplace Transform, Properties of Laplace Transform: Linear property, change of scale property, first shifting property, second shifting property, Multiplication by t property, division by t property, convolution property, Laplace transform of periodic functions, Laplace transform of derivatives. Finding inverse Laplace transform by different methods. Evaluation of integrals by Laplace transform, solving differential equations of higher order by Laplace Transform. (12 hours)

FOURIER TRANSFORM: Fourier Integrals, Fourier transforms, Fourier integral theorem, Fourier sine and cosine integrals, and their inverses. Properties of Fourier transforms. Application of Fourier transform to solve integral equations. Fourier sine and cosine integrals, and their inverses. **(08 hours)**

RECOMMENDED BOOKS:

- 1. N.P. Bali and M. Goyal, õA text book of Engineering Mathematicsö, Laxmi Publications, 2008.
- 2. B.S. Grewal, õHigher Engineering Mathematicsö, Khanna Publishers, 2010.
- 3. Dr.Bhopinder Singh, ø ENGINEERING MATHEMATICS III ö
- 4. Dr.Bhopinder Singh, @Complex analysis and Numerical Methodsö.

NOTE: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions have to be attempted, selecting at least two from each section. Use of calculator is allowed.

CLASS: B.E. 3 RD SEMESTER	CREDITS: 1			
BRANCH: ELECTRONICS & COMMUNICATION ENGG. COURSE NO: PEC-311 COURSE TITLE: ELECTRONIC DEVICES& CIRCUITS- I LAB	L 0	Т 0	P 2	Marks Practical 75

	COURSE OUTCOMES				
At the e	At the end of the course student will be able to:				
CO1	Plot forward and reverse characteristics of silicon and Zener diodes.				
CO2	Fabricate half and full wave rectifiers and evaluate their performance parameters.				
CO3	Plot the characteristics of FET using trainer kits.				
CO4	Plot V-I characteristics of transistor for various configurations using trainer Kit.				

- 1. To perform the operation characteristics of PN junction diode(Forward/Reverse Characteristics).
- 2. To perform the operation characteristics of Zener diode (Forward/Reverse Characteristics).
- 3. To perform the characteristics of Half wave Rectifier.
- 4. To perform the characteristics of Full wave Rectifier and Bridge Rectifier.
- 5. To perform the operation characteristics (Input/output) of PNP/NPN Transistor (Common Emitter/Common Base).
- 6. To perform the frequency response of signal amplifier (CE/CB).
- 7. To perform the characteristics of FET.
- 8. Determination of h parameter from transistor characteristics.
- 9. Design of Self Bias circuit using BJT.
- 10. Design of Self Bias circuit using FET.
- **NOTE:** Each student has to perform atleast eight experiments out of which 40% shall be simulation based. Additional Practical / Experiments will be performed based on the course content requirements.

CLASS: B.E. 3RD SEMESTER BRANCH: ELECTRONICS & COMMUNICATION ENGG. COURSE NO: PEC-312 COURSE TITLE: DIGITAL ELECTRONIC LAB

CREDIT: 1LTPPractical00275

COURSE OUTCOMES		
At the end of the course student will be able to:		
CO1	Implement and verify Boolean expressions using Logic Gates.	
CO2	Design and implement various combinational circuits using digital ICøs.	
CO3	Design seven segment decoder using Logical Gates.	
CO4	Design and implement various sequential circuits using digital IC øs	

- 1. Verification of truth tables of Logical Gates AND / OR / NOT, NAND, NOR, EXOR, EXNOR, Gates.
- 2. Implementation of Boolean expression using AND, OR, NOT, NAND, & NOR logic.
- 3. Implementation of Decoder, Encoder using ICøs & Gates.
- 4. To implement Half Adder, Half Subtractor, Full Adder, Full Subtractor using different ICøs & Gates.
- 5. Implementation of multiplexer, demultiplexer using IC & & gates.
- 6. Design of BCD to seven segment display using logical gates & ICø.
- 7. To design & verify truth table of Flip Flops.
- 8. To design various asynchronous counters using flip flops, gates & ICøs.
- 9. To design various synchronous counters using flip flops, gates & ICø.
- 10. To design & verify truth tables of shift Registers.
- **<u>NOTE</u>**: Each student has to perform atleast eight experiments. Additional Practical / Experiments will be performed based on the course content requirements.

CLASS: B.E. 3RD SEMESTER		CREDITS: 1		
BRANCH: ELECTRONICS & COMMUNICATION ENGG.				Marks
COURSE CODE: PEC-313	L	Т	Р	Practical
COURSE TITLE : ELECTRONICS WORKSHOP	0	0	2	50

	COURSE OUTCOMES				
At the end of the course student will be able to:					
CO1	Analyze different electronic components.				
CO2	Fabricate various electronic circuits on breadboard.				
CO3	Assemble various type of ICs on breadboard.				
CO4	Design electronic circuits using soldering techniques.				

- 1. Familiarization with various electronic components like resistor, capacitor, transistors, diodes, ICs, transformers etc.
- 2. To assemble the half wave rectifier and full wave rectifier circuit on breadboard.
- 3. To assemble the Common emitter Amplifier circuit
- 4. To assemble the differentiator circuit using IC741 on breadboard.
- 5. To assemble the astable multivibrator using 555 timer IC on breadboard.
- 6. To get familiar with soldering techniques.
- **<u>NOTE</u>:** Each student has to perform all the aforementioned Practical / Experiments Additional Practical / Experiments will be performed based on the course content requirements.

CLASS: B.E. 3RD SEMESTER			CREI	DIT: 1
BRANCH: ELECTRONICS & COMMUNICATION ENGG.				Marks
COURSE TITLE: MOOCs	L	Т	Р	Practical
COURSE NO: MOC-301	0	0	2	50

MOOCS: A massive open online course (MOOC) is a model for delivering learning content to any person who wants to take a course by means of the web. It has been incorporated in the 3rd semester.

Breakup of Marks:

• Attendance- 10 marks

Students will have to visit the lab twice a week as per the time table and pursue their respective online course.

• Report file-15 marks

A detailed report of about 20-25 pages has to be submitted to the department at the end of the semester. It should contain details about the course that was undertaken by the student. A copy of the assignments with solutions that have been uploaded on the MOOC platform should also be included in the final report. A copy of the certificate if awarded should also be appended to the report.

• Presentation- 15 marks.

The presentation should be given to the peers/students focusing on the key points of the course with an aim to share the knowledge.

Certification-10 marks

The students awarded with the certificate will be given 10 marks.(Copy to be attached in the report.)

CLASS: B.E. 3RD SEMESTER			CRED	(T: 1
BRANCH: ELECTRONICS & COMMUNICATION ENGG. COURSE TITLE: MINI PROJECT COURSE NO: PEC-303	L 0	T O	P 2	Marks Practical 50

The mini-project is a team activity having 3-4 students in a team. This is electronic product design work with a focus on electronic circuit design. Mini Project should cater to a small system required in laboratory or real life. It should encompass components, devices, analog or digital ICs, with which functional familiarity is introduced. After interactions with course coordinator and based on comprehensive literature survey/need analysis, the student shall identify the title and define the aim and objectives of mini-project. Completed mini project and documentation in the form of mini project report is to be submitted at the end of semester.

Distribution of Marks:

Attendance	10 marks (20%)
Report files	15 marks (30%)
Actual work done	15 marks (30%)
Viva-voce	10 marks (20%)

ANNEXURE-II

B.E. Electronics & Communication Engineering 4th Semester Examination to be held in the Year May 2020, 2021, 2022, 2023

B.E. Electronics & Communication Engineering 4th Semester

Contact Hrs: 28

COURSE	COURSE	Course Title	ALL	LOAI OCAT) TIONS	MA Distri	ARKS BUTION	TOTAL Maduks	CREDITS	%CHANGE
CODE	IYPE		L	Т	Р	INTERNAL	EXTERNAL	WIARKS		
PEC-401	Professional Core Courses	Analog Communication	3	1	0	50	100	150	4	100%
PEC-402	Professional Core Courses	Electronic Devices& Circuits II	3	1	0	50	100	150	4	100%
PEC-403	Professional Core Courses	Electromagnetic Waves& Transmission Lines	2	1	0	50	100	150	3	100%
PEC-404	Professional Core Courses	Signals and Systems	3	1	0	50	100	150	4	100%
EEE-401	Engineering Science Course	Electric Machines	2	1	0	50	100	150	3	100%
PEC-411	Professional Core Courses	Analog Communication Lab	0	0	2	75		75	1	100%
PEC-412	Professional Core Courses	Electronic Devices -II Lab	0	0	2	75		75	1	100%
EEE-411	Engineering Science Course	Electric Machines Lab	0	0	2	50		50	1	100%
PEC-413	Professional Core Courses	MATLAB	0	0	2	50		50	1	100%
NCC-401	Non Credit Course	Cyber Ethics & Laws	2	0	0	Satisfactory / Un-satisfactory		satisfactory	Non- credit	100%
	ТОТА	L	15	5	8	500	500	1000	22	

CLASS: B.E. 4 TH SEMESTER	CREDITS: 4						
BRANCH: ELECTRONICS & COMMUNICATION ENGG.				Μ	larks		
COURSE NO: PEC-401	\mathbf{L}	Т	Р	Theory	Sessional		
COURSE TITLE: ANALOG COMMUNICATION	3	1	0	100	50		
DURATION OF EXAM: 3 HOURS							

	COURSE OUTCOMES
At the	e end of the course student will be able to:
COI	Distinguish between different types of modulation techniques based on bandwidth occupied
COI	and power transmitted.
CO2	Compare the performance of communication system by evaluating the figure of merit for
02	different schemes of modulation.
CO3	Understand the performance of communication systems in the presence of noise and
	interference.
CO4	Familiar with Superhetrodyne receivers.
CO5	Apply techniques like matched filter, pulse shaping, line encoding and equalizer to mitigate the
05	adverse effects of noise and dispersion.

Detailed Syllabus

Section-A

Continuous Wave Modulation: The essentials of a Communication system, Amplitude modulation and demodulation , Generation of DSBSC waves, Coherent detection of DSBSC waves, Single side band modulation and demodulation, vestigial sideband modulation (VSB), frequency division multiplexing, Frequency modulation and demodulation, Introduction to super heterodyne receivers. (12 hours)

Effect of noise on Analog communication: Internal and external noise, Signal to noise ratio, Noise figure, Noise in AM and FM systems. (8 hours)

Section-B

Pulse Modulation: Sampling Process, Pulse-Amplitude Modulation, and Other forms of Pulse Modulation, Quantization Process, Pulse-Code Modulation, Time-Division Multiplexing, Delta Modulation, Linear Prediction, Differential Pulse-Code Modulation, and Adaptive Differential Pulse-Code Modulation. (10 hours)

Baseband Pulse Transmission: Introduction, Matched Filter, Error Rate Due to Noise, Intersymbol Interference, Nyquistøs Criterion for distortionless Baseband Binary Transmission. (8 hours)

BOOKS RECOMMENDED:

01.	Electronics Comm. System	By G. Kennedy
02.	Principles of Comm. System	By Taub& Schilling
03.	Communication System	By SimonHaykins

<u>NOTE</u>: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions have to be attempted, selecting at least two from each section. Use of calculator is allowed.

CLASS: B.E. 4 TH SEMESTER			CREI	DITS: 4	
BRANCH: ELECTRONICS & COMMUNICATION ENGG.					
COURSE NO: PEC-402				Μ	larks
COURSE TITLE: ELECTRONIC DEVICES &	\mathbf{L}	Т	Р	Theory	Sessional
CIRCUITS II	3	1	0	100	50
DURATION OF EXAM: 3 HOURS					

	COURSE OUTCOMES				
At the	At the end of the course student will be able to:				
CO1	Analyse classification and topologies of amplifier based on different parameters.				
CO2	Understand the concept, need and design of oscillators.				
CO3	Formulate different types of distortions for large signal amplifiers circuits.				
CO4	Apply the concepts of voltage regulators for practical applications.				

Detailed Syllabus

Section - A

Feedback Amplifier: Need for feedback, Feedback concept, Advantages of negative feedback, Ways of introducing negative feedback in amplifiers, Gain with and without feedback, Effect of negative feedback on input, output resistance and bandwidth of the amplifier, their respective analysis for feedback amplifiers, Procedure for analysis of feedback amplifiers, Analysis of different topologies. (10 hours)

Sinusoidal Oscillators: Introduction, necessity of oscillator, Gain with feedback, Barkhausen criteria, Requirements of oscillators, RC oscillators and phase shift oscillators, Wien bridge oscillators, LC oscillators, Crystal oscillators. (10 hours)

Section-B

Power Amplifiers: Introduction, general features of power transistor, difference between power transistor & a voltage amplifier, Classification of power amplifiers with necessary derivations, cross over distortion & its remedy, determination of harmonic distortion. (10 hours)

Voltage Regulators: Introduction and necessity of Voltage regulators, difference between unregulated & regulated power supply, types of Voltage regulators (Shunt and Series), monolithic and IC regulators (78XX, 79XX, LM317, LM337), switching regulators. (10hours)

BOOK RECOMMENDED:

Integrated Electronics
 Electronics Devices
 Electronics Devices
 Electronics Devices
 Malvino Leach
 Microelectronics
 Sedra& Smith

<u>NOTE</u>: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions have to be attempted, selecting at least two from each section. Use of calculator is allowed.

CLASS: B.E. 4 TH SEMESTER		(CREI	DITS: 3	
BRANCH: ELECTRONICS & COMMUNICATION ENGG.					
COURSE NO: PEC-403				Μ	larks
COURSE TITLE: ELECTROMAGNETIC WAVES &	L	Т	Р	Theory	Sessional
TRANSMISSION LINES	2	1	0	100 [°]	50
DURATION OF EXAM: 3 HOURS					
COURSE OUTCOMES					

	COURSE OUTCOMES
At the	end of the course student will be able to:
CO1	Attain knowledge about the vector analysis, coordinate system, electric and magnetic fields and calculation of
	flux density, potential and energy densities.
CO2	Analyse the Maxwell's equations and the wave propagation equation in free space and in different media.
CO3	Study the Transmission line and its parameters.
CO4	Solve for transmission line parameters at high frequencies and principles of impedance matching and Smith
	Chart.

Detailed Syllabus

Section - A

ELECTROSTATICS: Revision of vector analysis with rectangular, cylindrical, Spherical & polar coordinates, Electrostatic Potential, Potential gradient, Method of images, Energy density in electrostatics field, Electric field in dielectric media, Capacitance, Solution of Electrostatic problems using Poissonøs & Laplace equation.

(6 hours)

MAGNETOSTATICS: Magnetic flux density, & Magnetic potential, Torque on a closed circuit, Energy density in the magnetic field. (3 hours)

MAXWELL EQUATION UNIFORM PLANE WAVE : Application of Maxwell equation to circuits, Wave motion in perfect dielectric, Plane wave in Lossy dielectric, Propagation in good conduction, Standing wave ratio, Polarization, Reflection of uniform plane wave. (6hours)

S<u>ection – B</u>

TRANSMISSION LINE: Basic principles of T.L, Equivalent circuit of T.L, Basic transmission line equation, Input impedance, infinite T.L, Characteristics impendence (Zo), Propagation constant, attenuation constant, Phase constant, open and short circuits T.L, Velocity, wavelength, Voltage and power on line. Distortion in line Reflection and its coefficient. (8 hours)

LINE AT HIGH FREQUENCIES: Line Equation, Waveform on line terminated in various impedances, SWR, & its relation with reflection coefficient. Impedance of short Circuit and open Circuit line. Characteristic of /2 & /4 lines. Principle of Impedance matching & use of smith chart for impedance matching using /4 transformer & single stub. (7 hours)

BOOK RECOMMENDED:

01.	Engineering Electromagnetic	By	Jseph A. Edminister
02.	Introduction to Electromagnetic	By	Griffith

- 02. Introduction to Electromagnetic
- 03. Engineering Electromagnetic By Jr. Hyat
- 04. Network Line & Filters

05.

J. D. Ryder By Antenna & Wave Propagation By K. D. Prasad

NOTE: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions have to be attempted, selecting at least two from each section. Use of calculator is allowed.

CLASS: B.E. 4TH SEMESTER **CREDITS: 4 BRANCH: ELECTRONICS & COMMUNICATION ENGG. COURSE NO: PEC-404 COURSE TITLE: SIGNALS AND SYSTEMS** L Т Р **DURATION OF EXAM: 3 HOURS** 1 0 3

	COURSE OUTCOME
At the e	end of the course student will be able to:
CO1	Understand Mathematical description and representation of continuous and discrete time signals and
COI	systems.
CO2	Understand system properties and able to describe systems using linear constant coefficient differential
	equations and using their impulse response.
CO3	Compute the output of an LTI system given the input and the impulse response through convolution
	sum and convolution integral.
CO4	Develop basic problem-solving skills and become familiar with formulating a mathematical problem
	from a general problem statement.

Detailed Syllabus

Section-A

Representation / Classification of Signals and Systems: Continuous time signals óDiscrete time signals ó Representation of signals ó Step, Ramp, Pulse, Impulse, Sinusoidal, Exponential signals, Operation on the signals ó Classification of continuous time anddiscrete time signals ó Periodic, Aperiodic, Deterministic, Random, Even, Odd, Energy and Power Signals ó Continuous time and discrete time systems ó Classification of systems óProperties of systems. (10 hours)

Continuous Time Signal Representation / Analysis: Fourier series analysis óRepresentation of periodic signals in trigonometric and exponential forms ó Fourier transform analysis of aperiodic signals ó Spectral analysis of periodic and aperiodic signalsó Parsevaløs theorem for periodic and aperiodic signals ó Laplace transform in signal analysis. (10 hours)

Section-B

Discrete Time Signal Representation / Analysis: Discrete time Fourier series ó Discrete time Fourier transform ó Spectrum of discrete time periodic and aperiodic signals óParseval relations ó Z transform ó Properties and application to discrete time signal analysis 6 Inverse Z transform. (10hours)

Discrete Time Systems: LTI discrete time systems ó Difference equation ó Block diagram representation and reduction techniques ó impulse response ó Convolution Sum óProperties of discrete time LTI systems ó Frequency response ó Analysis of LTI system using Fourier and Z transform techniques. (10 hours)

BOOK RECOMMENDED:

- 01. Fundamentals of Signals & Systems
- 02. Principles of Signal Processing & Linear System
- 03. Signals & Systems
- 04. Signals & Systems

By Michael J Roberts By B.P. Lathi By Alan V. Oppenheim, Alan S. Willsky ByA. Anand Kumar

Marks

Sessional

50

Theory

100

05. Signals & Systems

By Simon Haykin, Barry Van Veen

<u>NOTE</u>: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions have to be attempted, selecting at least two from each section. Use of calculator is allowed. 4th Semester Examination to be held in the Year May 2020,2021,2022,2023

CLASS BRANC COURS	: B.E. 4 TH SEMESTER CH: ELECTRONICS & COMMUNICATION ENGG. SE NO: EEE-401	CREDITS: 3 Marks			arks	
COURS	SE TITLE: ELECTRIC MACHINES	L T P Theory Sessional		Sessional		
DURATION OF EXAM: 3 HOURS		2	1	0	100	50
	COURSE OUTCOME					
At the e	nd of the course student will be able to:					
CO1	To acquire knowledge about the construction and operating c	haracte	ristics	s of D	C machine	s.
CO2	To identify the relation between transformer and autotransfor	mers.				
CO3	To understand the principle of operation, testing and spe generators and motors.	ed con	trol c	of syn	nchronous	machines as

CO4 To analyze the application of special machines in various fields with their working principle.

Detailed Syllabus

Section - A

D.C. Generators: Operating principle, constructional features, E.M.F equation, Armature reaction and commutation, operating characteristics losses and efficiency. **(6 hours)**

D.C.Motors: Operating principle, back EMF, Torque equation, Starters, speed control, operating characteristics, and their applications. (6 hours)

Transformers: Principle of operation, Vector diagram, Regulation efficiency parallel operation, tap changing auto transformer. (6 hours)

Section - B

Synchronous Generators: Principle of operation, E.M.F equation, Leakage reactance, Vector diagram,
Voltage regulation by EMF and MMF method.(6 hours)

Synchronous Motors: Principle of operation, Vector diagram, V-curves and inverted V-curves, method of starting and their applications. (6 hours)

Induction Motors: Principle of operation, Types of motors, Equivalent circuits, Torque and power calculations, No load and blocked rotor test, speed control, Method of starting and their applications. (8hours)

Special A.C. Machines: Repulsion motors, A.C series motors, Universal motor, single phase induction motor and their applications. (4 hours)

BOOKS RECOMMENDED:

- 1) Theory of A.C Machines
- 2) Principles of D.C. Machines
- 3) Performance and design of A.C Machines
- 4) Advanced Electrical Technology

A. Langsdrof Clayson and Hancock M.G. Say H.A. Cotton **<u>NOTE</u>**: There shall be total eight questions, four from each section. Each question carries 20 marks. Five questions have to be attempted, selecting at least two from each section. Use of calculator is allowed.

4th Semester Examination to be held in the Year May 2020,2021,2022,2023

CLASS: B.E. 4 TH SEMESTER		(CREDI	TS: 1
BRANCH: ELECTRONICS & COMMUNICATION ENGG. COURSE NO: PEC-411 COURSE TITLE: ANALOG COMM. LAB	L 0	Т 0	P 2	Marks Practical 75

	COURSE OUTCOME			
At the e	At the end of the course student will be able to:			
COI	Plot frequency response of RF Tuned Amplifier and IFT by calculating gain at different range of			
COI	frequencies.			
CO2	Understand the significance of modulation index in communication system by observing maximum			
	and minimum value in AM modulated wave.			
CO3	Design frequency modulation circuit using IC 8038.			
CO4	Design sampler using IC-LF398, ASK modulation circuit using transistor BC547.			

LIST OF EXPERIMENTS

- 01. To plot the response of RF Tuned Amp.
- 02. To find the modulation index of AM signal.
- 03. Hardware realization of AM demodulation circuit.
- 04. Hardware realization of FM modulation circuit using IC 8038.
- 05. To plot the response of IF transformer.
- 06. Hardware realization of sample & hold circuit.
- 07. Hardware realization of ASK modulation circuit.
- 08. Study of PCM & TDM signal.
- **NOTE:** Each student has to perform atleast six experiments out of which 40% shall be simulation based. Additional Practical / Experiments will be performed based on the course content requirements.

CLASS: B.E. 4 TH SEMESTER			CF	REDITS: 1
BRANCH: ELECTRONICS & COMMUNICATION ENGG. COURSE NO: PEC-412 COURSE TITLE: ELECTRONIC DEVICES -II LAB	L	T	P 2	Marks Practical 75

	COURSE OUTCOME
At the	end of the course student will be able to:
CO1	Calculate the voltage gain, resistance calculation at input and output using feedback and without
COI	feedback.
CO2	Distortion output calculation at the output of Class B amplifier.
CO3	Plot the frequency response of class C amplifier
CO4	Calculation of output power and efficiency of a class A amplifier.
CO5	Study the output of push pull amplifier.
CO6	Study stability factor for Zener, shunt and IC regulators.
CO7	Designing of voltage regulator using series pass transistor.
CO8	Determine the output of Collpitt, Clap, Hartley, Wein bridge in frequency form.

- 01. Determination of voltage gain, Input/output resistance of amplifiers using with & without feedback.
- 02. Determination of Distortion output power in case of push pull class-B amplifier.
- 03. Determination of frequency response of class-C tuned amplifier.
- 04. Study of signal stage class-A power amplifier & determine output power & efficiency.
- 05. Study of complimentary symmetry push pull amplifier.
- 06. Design & determination of stability factor series of Zener shunt Regulator / IC Regulator.
- 07. Design of voltage regulator using series pass transistor.
- 08. Study of Collpitt, Clapp, Hartley, Wein bridge, Phase regulator & determine the frequency of output waveform.
 - **NOTE:** Each student has to perform atleast six experiments out of which 40% shall be simulation based. Additional Practical / Experiments will be performed based on the course content requirements.

CLASS: B.E. 4 TH SEMESTER		(CRED	OITS: 1
BRANCH: ELECTRONICS & COMMUNICATION ENGG.				Marks
COURSE NO: EEE-411	L	Т	Р	Practical
COURSE TITLE: ELECTRICAL M/C LAB	0	0	2	50

	COURSE OUTCOMES	
At the	At the end of the course student will be able to:	
CO1	Identify the parts of cut-sectional model of D.C.and AC machines.	
CO2	Study the operating characteristics of D.C. machine and AC machines.	
CO3	Determine the voltage regulation and efficiency of transformer	
CO4	Perform the turns ratio and polarity test on single-phase transformer.	

LIST OF EXPERIMENTS

- 1. To study the magnetic characteristics of a D.C. Machines at various operating speeds and finds the operating point of D.C. shunt machine from the same.
- 2. To determine the load characteristics of a D.C. Shunt generator and find its overall efficiency.
- 3. To study the torque/speed characteristics of a D.C. series, shunt and compound motor motor using various field tapings.
- 4. To find the efficiency and study various losses of D.C. Machines using Hopkinson test.
- 5. To study a single phase transformer, its Voltage ratio and turns ratio relationship. Perform open & short circuit test to determine losses, efficiency and voltage regulation and also its various parameters.
- 6. Study of parallel operation & synchronization of 3-phase synchronous generators.
- 7. Speed control of 3-phase Induction motor by varying supply frequency & of 3-phase slip Ring Induction motor by Rotor Impedance Control.
- 8. To determine turn ratio and to perform polarity test on single phase transformer.
- **NOTE:** Each student has to perform atleast six experiments. Additional Practical / Experiments will be performed based on the course content requirements.

CLASS: B.E. 4 TH SEMESTER		CR	EDITS:	: 1
BRANCH: ELECTRONICS & COMMUNICATION ENGG.				Marks
COURSE NO: PEC-413	L	Т	Р	Practical
COURSE TITLE: MATLAB PROGRAMMING	0	0	2	50

	COURSE OUTCOMES			
At the	At the end of the course student will be able to:			
CO1	Perform various arithmetic calculations.			
CO2	Find importance of this software for generating equations of vectors and other mathematical expressions.			
CO3	Articulate importance of software in creating and printing simple, 2D & 3D plots and execution functions			
CO4	Do various library blocks and their interconnections.			

LIST OF EXPERIMENTS:

- 1. Study of arithmetic, exponential, Logarithmic, Trigonometric, complex number calculation.
- 2. To generate equation of straight line, Geometric series, points on circle, multiply, divide and exponential vectors.
- 3. To create and print simple plots and execution of functions.
- 4. To generate matrices and vectors, array operations, inline functions anonymous functions etc.
- 5. To generate functions like execution a function, global variable, structures.
- 6. To generate 2D, 3D plots.
- 7. Study of various library blocks and their interconnections.

<u>NOTE</u>:Each student has to perform all the aforementioned Practical / Experiments. Additional Practical / Experiments will be performed based on the course content requirements.

CLASS: B.E. 4TH SEMESTER BRANCH: ELECTRONICS & COMMUNICATION ENGG. COURSE NO: NCC-401

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COURSE NO	D: NCC-401200Satisfactory/Unsatisfactory
	COURSE OUTCOMES
At the end of	the course the student will be able to: -
CO1	Understand the basic concepts of Cyber Ethics & Laws.
CO2	Understand about the constitutional and Human Rights Issues in Cyber space.
CO3	Understand Cyber Crimes and Legal Framework.
CO4	Understand about the limitations and current issues in the area.
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COURSE TITLE: CYBER ETHICS & LAWS

Detailed Syllabus

Unit-I: Ethics in Cyber Space, Core Values and Virtues, Dimensions of Cyber Ethics in Cyber Society, Cyber Ethics by Norms, Laws and Relations, Principle & Significance of Cyber Ethics, Ethics in Information Society.

Unit-II: Computer and its impact in Society, Overview of Computer and Web Technology, what are Cyber Laws, Need for Cyber Laws, Cyber Jurisprudence at International and Indian Level

Unit-III: Objectives, Importance of Cyber Laws, Right to Access Cyberspace-Access to internet, Right to privacy, Right to data protection, Advantages and Disadvantages

Unit-IV: Cyber Crime against Individual, Institution and State, Types of Cyber Crimes, Cyber Crimes and Legal Framework

Unit-V: Limitations and Current Issues relating Cyber Ethics & Cyber Laws in the Society

BOOKS RECOMMENDED:

- 1. Cyber Laws
- 2. Cyber Laws and Crimes Simplified
- 3. Cyber Ethics 4.0

Justice Yatindra Singh Adv. Prasant Mali Christoph Stuckelberger and Pavan Duggal

NOTE: This is a Mandatory Non-Credit Course. Two objective papers will be conducted internally by the department. The students are required to score at least 40% or above in totality to be considered qualified in the course.