UNIVERSITY OF JAMMU

NOTIFICATION

(18/Oct/Adp/72)

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 (Computer 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
Computer	**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 University Website: www.jammuuniversity.in.

s/d-
DEAN ACADEMIC AFFAIRS

No. F.Acd/III/18/10815-10826
Dated: 31 **/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 (Academics)

31/10/18

B.E. Computer Engineering First Semester Examination to be held in the Year December 2018,2019,2020,2021

B.E. Computer Engineering 1st Semester

Contract Hrs. : 24

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits	%Change
			L	T	P	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	0	50	100	150	4	100%
ESC-101	Engineering Science Course	Computer Programming	3	1	-	50	100	150	4	100%
BSC-112	Basic Science Course	Engineering Physics (Lab)	-	-	3	50	-	50	1.5	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 & Professional Development	-	-	2	Satisfactory / Un-Satisfactory			Non-Credit	100%
NCC-102		Environmental Sciences								
NCC-103		Indian Constitution								
TOTAL			**10**	**4**	**10**	**300**	**400**	**700**	**18**	

First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

BRANCH: COMMON TO ALL BRANCHES

COURSE TITLE: ENGINEERING MATHEMATICS-I **CREDITS: 5**

COURSE No.: BSC-101

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	0	100	50

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

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

CO 2 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.

CO 4 differentiate the concept of scalars , vectors, gradient, divergence and curl.

CO 5 Evaluate the complex no. in polar form and understand the idea of hyperbolic functions

Detailed Syllabus

UNIT - I Differential Calculus – I **(07 hrs)**

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 **(07 hrs)**

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 **(08 hrs)**

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 **(06 hrs)**

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 **(05 hrs)**

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 **(08 hrs)**

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.

BOOKS RECOMMENDED:

1.	Calculus and Analytic Geometry	Thomas and Finney, 9th Edition, Pearson, 2002.
2.	Differential Calculus	S. Narayan and P.K. Mittal, S.Chand, New Delhi.
3.	Vector Calculus	S. Narayan andP.K. Mittal, S.Chand, New Delhi.
4.	Higher Engineering Mathematics	B.S Grewal, Khanna Publishers, New Delhi
5.	Engineering Mathematics-I	Dr. Bhopinder Singh
6.		

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.

First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

BRANCH:COMPUTER/E&C/IT ENGINEERING

COURSE TITLE: ENGINEERING PHYSICS **CREDITS: 4**

COURSE No.: BSC-102

DURATION EXAM.: 3 HRS

L	T	P	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 .

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.

7hrs, Weightage = 20%

Module VI : LASERS AND FIBRE OPTICS

Principal of Laser action , Einstein's co-efficients, Ruby & Co_2 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.

5hrs, Weightage = 10%

TUTORIALS

S.No	TOPICS
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-V
T-6	Numerical Problems related to topics in Unit-VI

NOTE: 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	AUTHOR
1. Physics	Reisnick & Halliday
2. Fundamentals of Electricity & Magnetism	Duggal & Chabbra
3. Modern Physics	Beiser
4. Modern Physics	Blatt
5. Modern Physics	Gupta & Gupta
6. Sound	Subramaniam
7. Basic Electronics	Millman & Halkias
8. Semi conductor Physics and Devices: Basic Principles	Donald A. Neamen
9. Optics	Brijlal & Subramaniam
10. Fibre Optics	Ghatak, Tyagrajan
11. Lasers	K.R. Nambiyar
12. Modern Engineering Physics	A.S. Vasudeva

First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

BRANCH:COMPUTER/E&C/IT ENGINEERING

COURSE TITLE: ENGINEERING PHYSICS LAB **CREDITS: 1.5**

COURSE No.: BSC-112

DURATION EXAM.: 3 HRS

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 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.

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 Physics	Warsnop & Flint
3.	Practical Physics	Chauhan & Singh (Vol. I & Vol. II)

First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

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

COURSE TITLE: COMPUTER PROGRAMMING **CREDITS: 4**

COURSE No.: ESC-101

DURATION EXAM.: 3 HRS

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)**

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)

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.

BOOKS RECOMMENDED:

1. C How to Program, 7/e - Paul J. Deitel
2. Programming With C - Byron Gottfried.
3. Programming With C - E. Balaguruswamy.
4. C The Complete Reference - Herbert Schildt.
5. Let us C - Yashwant Kanitkar.
6. Programming in C : A Practical Approach - Ajay Mittal

First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

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

COURSE TITLE: COMPUTER PROGRAMMING LAB **CREDIT: 1**

COURSE No.: ESC-111

DURATION EXAM: 3 HRS

L	T	P	MARKS	
			THEORY	PRACTICAL
0	0	2	0	50

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

First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

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

COURSE TITLE: ENGINEERING GRAPHICS **CREDITS: 2.5**

COURSE No.: ESC-102

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
1	0	3	100	50

Course Outcomes (COs)

Students will be able to:

1. Draw orthographic projections of sections.
2. Use architectural and engineering scales with accuracy.
3. Work with zeal of office practices and standards.
4. Convert sketches to engineered drawing.
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

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

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.

First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

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

COURSE TITLE: MENTORING & PROFESSIONAL DEVELOPMENT **CREDIT: Non-Credit**

COURSE No.: NCC-101 **L T P**

DURATION EXAM: 3 HRS **0 0 2**

Detailed Syllabus

1. 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)

2. Meaning and components of personality, Personality development models Johari Window and Transactional analysis, Motivation – meaning and approaches, Leadership –meaning and style. (8)

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%.

First Semester Examination to be held in the Year December 2018,2019,2020,2021

CLASS: B.E. 1ST SEMESTER

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

COURSE TITLE: ENVIRONMENTAL SCIENCES **CREDIT: Non-Credit**

COURSE No.: NCC-102 **L T P**

DURATION EXAM: 3 HRS **0 0 2**

Detailed Syllabus

1. **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.

First Semester Examination to be held in the Year December 2018,2019,2020,2021

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%.

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

B.E. Computer Engineering 2nd Semester **Contract Hrs. : 26**

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits	%Change
			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%
TOTAL			**12**	**4**	**10**	**350**	**350**	**700**	**21**	

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 **CREDITS: 5**

COURSE No.: BSC-201

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
3	2	0	100	50

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

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

CO 2 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.

CO 4 differentiate the concept of scalars , vectors, gradient, divergence and curl.

CO 5 Evaluate the complex no. in polar form and understand the idea of hyperbolic functions

Detailed Syllabus

UNIT- I Introduction to infinite series & sequences **(06 hrs)**

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 **(10 hrs)**

(i) Fourier series: Euler's formula, sufficient conditions for a Fourier expansion, functions having points of 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.

(ii) Power series: Analytic function, ordinary point, singular point, regular and irregular singular points of o.d.e. $Y'' + P(x)\,Y' + Q(x)\,Y = 0$, Series solution of differential equations about an ordinary point, Frobenius series solution about a regular singular point. Examples of Legendre and Bessel's differential equations.

Unit – III First Order partial differential equations **(05 hrs)**

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 **(07 hrs)**

Homogenous and Non-homogenous higher order linear partial differential with constant coefficients Rules for finding P.I and C.F, Non-Linear equations of 2^{nd} 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 **(08 hrs)**

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.

Unit – VI Vector Spaces **(5 hrs)**

Definition, Linear transformation, basis, dimensions of a vector space, Range and Kernel of a linear transformation, Rank, Nullity, Rank-Nullity theorem, Matrix associated with a linear transformation.

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 — E. Kreyszig, 2006
2. Higher Engineering Mathematics — Dr. B.S. Grewal, Khanna Publication, New Delhi
3. Engineering Mathematics -II — Dr. Bhopinder Singh
4. Partial differential equations — M.D.RaiSinghania
5. Linear Algebra — D.Poole,2nd Edition, 2005

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 **CREDITS: 4**

COURSE No.: BSC-203

DURATION EXAM.: 3 HRS

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 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

6hrs

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).

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

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

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. 8hrs

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	Author
1.	Engineering Chemistry	Jain & Jain
2.	Engineering Chemistry	Sharma, B.K.
3.	Engineering Chemistry	Dara, S.S.
4.	Engineering Chemistry	Shashi, Chawla
5.	Organic Chemistry	Bahl, B.S.
6.	Environmental Chemistry	De, A.K.
7.	Spectroscopy of Organic Compounds	Silverstein
8.	Spectroscopy of Organic Compounds	Kalsi, P.S.
9.	Polymer Science	Gowrikar, V.R. etal
10.	Engineering Chemistry	Dr. Rajinder Kumar

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 **CREDITS: 1.5**

COURSE No.: BSC-213

DURATION EXAM.: 3 HRS

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 $Na_2S_2O_3$.
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	AUTHOR
1. A manual of practical Engineering Chemistry	(Dr. Rajinder Kumar)
2. Experimental Engineering chemistry	(Shashi Chawla)

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	T	P	MARKS	
			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 **(8 hours)**

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 **(8 hours)**

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.

Module 3: Three-phase Circuits **(6 hours)**

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 **(6 hours)**

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.

Module 5: Electrical Machines **(8 hours)**

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 **(6 hours)**

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.

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

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 **CREDIT: 1**

COURSE No.: ESC-213

DURATION EXAM.: 3 HRS

L	T	P	MARKS	
			THEORY	PRACTICAL
0	0	2	0	50

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 **CREDITS: 2**

COURSE No.: HMC-201

DURATION EXAM: 3 HRS

L	T	P	MARKS	
			THEORY	SESSIONAL
2	0	0	50	25

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, Memos,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 Agreement.

6 hrs

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.

5 hrs

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.

5 hrs

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).

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

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	T	P	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

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 **CREDITS: 2.5**

COURSE No.: ESC-214

DURATION EXAM: 3 HRS

L	T	P	MARKS	
			THEORY	PRACTICAL
1	0	3	0	50

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 pieces (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 I & II by Rao. P.N
- Manufacturing Technology by Gowri .P. Hariharan and A. Suresh Babu

UNIVERSITY OF JAMMU

NOTIFICATION

(19/Aug/Adp/28)

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 (Computer 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	Semester	For the Examination to be held in the years
Computer	**Semester-III**	**December 2019, 2020, 2021 and 2022**
	Semester-IV	**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/19/4745-4756
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)

19/8 19/8 19/08/19

ANNEXURE-1

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

B.E. Computer Engineering 3rd Semester **Contact Hrs: 26**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	Credits	% Change
			L	T	P	Internal	External			
PCS-301	Professional Core Course	Object Oriented Programming using C++	3	1	0	50	100	150	4	100%
PCS-302	Professional Core Course	PC Hardware& Maintenance	2	1	0	50	100	150	3	100%
EEC-301	Engineering Science Course	Analog Electronics	2	1	0	50	100	150	3	100%
BSC-302	Basic Science Course	Numerical Methods	2	1	0	25	75	100	3	100%
HMC-302	Humanities & Social Science Course	Entrepreneurship and Business Strategies	2	1	0	50	100	150	3	100%
PCS-311	Professional Core Course	Object Oriented Programming using C++ Lab	0	0	2	50	-	50	1	100%
PCS-312	Professional Core Course	PC Hardware& Maintenance Lab	0	0	2	50	-	50	1	100%
EEC-311	Engineering Science Course	Analog Electronics Lab	0	0	2	50	-	50	1	100%
PCS-313	Professional Core Course	Numerical Methods using C- Programming Lab	0	0	2	50	-	50	1	100%
MOC-314	Massive Open Online Course	MooC								100%
NCC-301	Non-Credit Course	Cyber Ethics & Laws	2	0	0	Satisfactory/ Un-Satisfactory			Non-Credit	100%
TOTAL			**13**	**5**	**8**	**425**	**475**	**900**	**20**	

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

CLASS: B.E. 3RD SEMESTER **CREDITS: 4**
BRANCH: COMPUTER ENGINEERING
COURSE NO: PCS-301
COURSE TITLE: OBJECT ORIENTED PROGRAMMING USING C++
DURATION OF EXAM: 3 HOURS

			Marks	
L	**T**	**P**	**Theory**	**Sessional**
3	**1**	**0**	**100**	**50**

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Understand the difference between Structured Programming approach and Object Oriented Programming approach.
CO2	Acquire knowledge in developing object oriented solutions to problems by learning the usage of Data Abstraction, Encapsulation, and Inheritance.
CO3	Design and Implement programs using Classes and Objects.
CO4	Understand the concept of Inheritance, Polymorphism, Operator Overloading and Function Overloading.
CO5	Apply the concepts of Object Oriented Programming in Templates & Exception Handling, File related operations and in real-time application development.

Detailed Syllabus

Section- A

Review of Pointers: Passing parameters, Array of Pointers, Character Pointers. **(2 Hrs)**

Programming Techniques: Unstructured, Procedural, Modular. Introduction to Objects, Object & Cohesion **(3 Hrs)**
Overview of C++: Object Oriented programming, Encapsulation, Polymorphism, Inheritance, Console I/O, C++ Comments. **(3Hrs)**
Classes& Objects: Metaclass, Abstract class, Public and Private variables, Constructor and Destructor Functions, Constructors taking parameters, Object Pointers, In-Line Functions, Automatic Inlining, Friend Functions, This Pointer, New & Delete, Array of Objects. **(12Hrs)**

Section- B

Overloading: Function Overloading, Overloading Constructor Functions, Operator overloading, Overloading Binary and Unary Operators, Overloading Relational & Logical Operators. **(8Hrs)**
Inheritance: Using Protected Members, Multiple Inheritance, Virtual Base Classes, Introduction to Virtual Functions. **(6 Hrs)**
Templates & Exception Handling: Use of Templates, Function Templates, Class Templates, Handling Exception. **(4 Hrs)**
File Handling: I/O Basics, Ifstream, Ofstream, Fstream, Open(), Close(), EOF(), Binary I/O, Get(), Put(), Read(), Write(), Random Access, Seekg(), Seekp(), Tellg(), Tellp(). **(4 Hrs)**

BOOKS RECOMMENDED:

1. Programming in C++ — Balaguruswamy
2. C++ the Complete Reference — Herbert Schildt.
3. Mastering C++ — K.R. Venugopal& T. Ravishankar& Raj Kumar.
4. Turbo C++ — Robert Lafore.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions 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. 3RD SEMESTER **CREDITS: 3**
BRANCH: COMPUTER ENGINEERING
COURSE NO: PCS-302
COURSE TITLE: PC HARDWARE AND MAINTAINANCE
DURATION OF EXAM: 3 HOURS

			Marks	
L	**T**	**P**	**Theory**	**Sessional**
2	**1**	**0**	**100**	**50**

COURSE OUTCOMES	
At the end of the course the student will be able to: -	
CO1	Understand about the latest developments in PC Hardware & its Peripherals.
CO2	Know about memory devices and its implementation in PC.
CO3	Acquire knowledge about the significance of device drivers in PC.
CO4	Analyze PC Fault Detection, Correction & Maintenance.
CO5	Implement various tools for Virus scanning & PC diagnostics.

Detailed Syllabus

Section-A

Computer Assembling: – Introduction ï Overview of Parts of PC, Cabinet, Motherboard- components, function and form factor, Types of Buses, Disk drives, Network Card ï Interfaces,CPU Main Memory, IO peripherals. **(8 Hrs)**

BIOS and CMOS Setup:– Introduction ï Features , Developers, Identification, Interrupts , BIOS Upgrade , Troubleshooting. Standard CMOS Setup, Power Management, Setup Password Settings, Auto Configuration, BIOS Optimization, Power On Self Test (POST) **(4 Hrs)**

Display Adapters and Device Drivers:–Introduction, Types of display adapters (VGA,SVGA) Accelerated Graphic Ports ï 3D Cards , Device Drivers ï IO drivers, Sound Drivers, LAN Drivers etc, Role of device drivers in a PC. **(6 Hrs)**

Section- B

PC Power Supplies:-SMPS- Types of SMPS, principle working, SMPS form factor, CVT, UPS- its types and working, criteria for selecting right UPS for PCs. **(6 Hrs)**

Preventive Maintenance :– Introduction ,Need ,Tools , Procedures ï Active Hardware Maintenance ,Active Software Maintenance ï Passive Maintenance Procedures ,Preventive Maintenance Schedule, Virus-types, Detection and Precaution. **(8 Hrs)**

Troubleshooting :– Introduction , Types of PC Faults , Solid Faults , Intermittent Faults , Developing Strategy,Diagnostic and Repair Tools ï Diagnostic Software Tools , Diagnostic Hardware Tools. **(6 Hrs)**

BOOKS RECOMMENDED:-

1. IBM PC & Clones: Hardware, Troubleshooting & Maintenance — Govindarajalu.
2. Computer Installation & Troubleshooting — M. Radhakrishan & Dr. Balasubramanian
3. Computer Hardware Installation, Interfacing, Trouble shooting and Maintenance — K. L. James
4. A+ Guide to Managing & Maintaining Your PC — Jean Andrews

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions 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. 3RD SEMESTER **CREDITS: 3**
BRANCH: COMPUTER ENGINEERING
COURSE NO: EEC-301
COURSE TITLE: ANALOG ELECTRONICS
DURATION OF EXAM: 3 HOURS

L	T	P	Marks: Theory	Marks: Sessional
2	1	0	100	50

COURSE OUTCOMES	
At the end of the course the student will be able to: -	
CO1	Understand the principles of semiconductor devices and their applications.
CO2	Understand the characteristics of transistors and perform analysis on DC and AC loadline.
CO3	Attain basic knowledge of FETs and MOSFETs.
CO4	Perform analysis of single stage and multistage amplifiers.
CO5	Learn the basics of h- parameters.

Detailed Syllabus

Section-A

Semiconductor Devices: PN junction diode, Volt-ampere characteristics, diode capacitance, static and dynamic resistances, Zener diode, tunnel diode, schottky diode, photodiode, LED-their characteristics and analysis, Half wave, full wave and bridge rectifier with necessary derivations, Voltage regulation, Capacitor filter, Inductor filter, LC filter, Bleeder resistor, numerical problems. **(11 Hrs)**

Transistors: Transistor and itscharacteristics in CE,CB,CC mode, Ebers-Moll model, generalized transistor equation, Base width modulation, types of biasing circuits, operating point and load line.

(10 Hrs)

Section-B

FET: Introduction, Construction and operation of JFET, Characteristics, JFET parameters and their relationship,MOSFET- depletion and enhancement type- characteristics and operation. **(8 Hrs)**

Amplifiers: Principle of operation and classification of amplifiers (Single stage and multistage amplifiers) analysis and frequency response of amplifiers, multistage amplifiers- LC, RC, DC and transformer coupled. **(9 Hrs)**

Hybrid Parameters: Introduction, Two port network, Determination of h-parameters, h-parameter equivalent circuit, hybrid model for CE, CB, CC configuration with necessary derivations. **(4 Hrs)**

BOOKS RECOMMENDED:

1. Integrated Electronics — Millman & Halkias
2. Basic Electronics — J.B Gupta
3. Electronics Devices — Bolystead

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions 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. 3RD SEMESTER **CREDITS: 3**
BRANCH: COMPUTER ENGINEERING
COURSE NO: BSC-302
COURSE TITLE: NUMERICAL METHODS
DURATION OF EXAM: 3 HOURS

			Marks	
L	**T**	**P**	**Theory**	**Sessional**
2	**1**	**0**	**75**	**25**

COURSE OUTCOMES	
At the end of the course the student will be able to: -	
CO1	Find out the exact real root of algebraic and transcendental equations.
CO2	Obtain the values of function at a given point within the given data by using certain method of Interpolation
CO3	Calculate the definite integral using some appropriate numerical methods.
CO4	Solve various differential equations using numerical methods

Detailed Syllabus

Section-A

Roots of algebraic equations: - Bisection methods, Secantmethods, Newton Raphson Method, Method for finding complex roots, Graeffeôs Root squaring method, Regula Falsi method, iteration method. **(10 Hrs)**

Solution of simultaneous algebraic equations: - Partition method for linear system of equations, Power method for finding Eigen values, properties & bounds for Eigen values & Eigen vectors. **(10 Hrs)**

Section-B

Interpolation:- Newtonôs Forward, Backward & Divided difference interpolation, Central difference interpolation formula, Stirlingôs & Besselôs formula, Langrangeôs interpolation formula. **(6 Hrs)**

Numerical Differentiation &Integration:-Derivatives using Forward Difference Formula, Backward difference formula & Central difference formula, Numerical Integration using Trapezoidal Rule & Simpsonôs Rule. **(10 Hrs)**

Differential equations & their solutions: - Taylorôs series method, Eulerôs method, Rangakutta method, Picardôs method. **(4 Hrs)**

BOOKS RECOMMENDED:

1	Elementary Numerical Analysis	S.D. Conte & Carl De Boor., Macgraw hill
2	Numerical Method for Scientists & Engineers	M.R. Jain, S.R.K.Iynegar& R.K Jain.,WileyEastern
3	Elementary Numerical Methods	B.S.Grewal,KnannaPublishion
4	A textbook on complex analysis and Numerical methods	Bhopinder Singh, Kirti Publications.

NOTE: There will be eight questions of 15 marks each, four from each section. Students are required to attempt five questions selecting at least two questions 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. 3RD SEMESTER **CREDITS: 3**
BRANCH: COMPUTER ENGINEERING
COURSE NO: HMC-302
COURSE TITLE: ENTREPRENEURSHIP & BUSINESS STRATEGIES
DURATION OF EXAM: 3 HOURS

			Marks	
L	**T**	**P**	**Theory**	**Sessional**
2	**1**	**0**	**100**	**50**

COURSE OUTCOMES	
At the end of the course the 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 Hrs)**

New Generations of Entrepreneurship: Women Entrepreneur: Classification of Women Entrepreneur in India, Problems of Women Entrepreneur, steps for promoting women entrepreneurship; Social Entrepreneur: Problems and steps for promoting social entrepreneurship. **(6 Hrs)**

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

Section-B

Lean Startups: Introduction to lean startups, Business pitching: Definition, types and importance. **(5Hrs)**

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 Hrs)**

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 Hrs)**

BOOKS RECOMMENDED:

1. Fundamentals of Entrepreneurship — H. Nandan.
2. Business model generation — Alexander Osterwalder &Yves Pigneur
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 will 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. 3RD SEMESTER **CREDIT: 1**
BRANCH: COMPUTER ENGINEERING
COURSE NO.: PCS-311
COURSE TITLE: OBJECT ORIENTED PROGRAMMING USING C++ LAB

L	T	P	Marks Practical
0	0	2	50

COURSE OUTCOMES **After Completion of this course the student will be able to: -**	
CO1	Develop solutions for a range of problems using Objects and Classes.
CO2	Implement the concepts of Constructors, Destructors and Operator Overloading.
CO3	Apply fundamental algorithmic problems including Type Casting, Inheritance.
CO4	Implement the concepts of Run Time Polymorphism using Virtual Functions
CO5	Implement the concepts of Generic Programming, Templates, File Handling using C++.

Lab Experiments:

Experiment 1	Design and implement programs using Pointers.
Experiment 2	Design and implement programs using Classes and Objects.
Experiment 3	Design and implement programs using Constructors and Destructors.
Experiment 4	Design and implement programs using the concepts of Inheritance.
Experiment 5	Design and implement programs using Friend Function.
Experiment 6	Design and implement programs using New and Delete operator.
Experiment 7	Design and implement programs using the concepts of Overloading.
Experiment 8	Design and implement programs using the concepts of files.

NOTE: Additional Lab experiments/practicals will be performed based on the course contents requirements.

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

CLASS: B.E. 3RD SEMESTER **CREDIT: 1**
BRANCH: COMPUTER ENGINEERING
COURSE NO: PCS-312
COURSE TITLE: PC HARDWARE AND MAINTAINANCE LAB.

L	T	P	Marks Practical
0	0	2	50

COURSE OUTCOMES	
After Completion of this course the student will be able to: -	
CO1	Install, configure, optimize and upgrade the portable personal computer.
CO2	Perform routine maintenance and upgrade of the computer system.
CO3	Identify the existing configuration of the computers and peripherals.
CO4	Define input and output characteristics of different configurations of transistors.
CO5	Perform diagnostic procedures and troubleshooting techniques to personal computer.

Lab Experiments:

Experiment1 Study of keyboard- Mechanical Keyboard & Membrane Keyboards
Experiment 2 Study of Printers a)Dot-Matrix Printers b) Inkjet Printers
Experiment 3 Study of SMPS
Experiment 4 Assembling the Units of Computer
Experiment 5 Fault finding in the various units of Computer, Fault finding Codes & Beeps.
Experiment 6 Software loading at different platforms such DOS, Windows- 95/98/2000
Experiment 7 Use of Antivirus Software

NOTE: Additional Lab experiments/ practicalôs will be performed based on the course contents requirements.

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

CLASS: B.E. 3RD SEMESTER **CREDIT: 1**
BRANCH: COMPUTER ENGINEERING
COURSE NO: EEC-311
COURSE TITLE: ANALOG ELECTRONICS LAB

L	T	P	Marks Practical
0	0	2	50

COURSE OUTCOMES **After Completion of this course the student will be able to: -**	
CO1	Plot forward and reverse characteristics of PN junction diode and Zener diode.
CO2	Fabricate half and full wave rectifiers and evaluate their performance parameters
CO3	Plot the characteristics of transistor for various configurations using trainer kit.
CO4	Plot the characteristics of FET using trainer kit.

Lab Experiments:

Experiment 1	Familiarization with various Electronic Components- resistors, capacitors, Transistors, diodes, IC, Transformers
Experiment 2	Diode characteristics (Forward and reverse)
Experiment 3	Diode as a Rectifier with capacitor filter(Half & Full Bridge)
Experiment 4	Zener diode characteristics & Zener diode as voltage regulator
Experiment 5	Characteristics of Tunnel Diode, LEDôs, photodiode.
Experiment 6	Characteristics of transistors in CB, CE & CC mode.
Experiment 7	Design of self bias circuit using BJT.
Experiment 8	Characteristics of JFET, MOSFET.
Experiment 9	Determination of h-parameters from transistor characteristics.

NOTE: Students should perform at least 7 out of 9 experiments.

NOTE: Additional Lab experiments/practicals will be performed based on the course contents requirements.

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

CLASS: B.E. 3RD SEMESTER **CREDITS: 1**
BRANCH: COMPUTER ENGINEERING
COURSE NO. PCS-313
COURSE TITLE: NUMERICAL METHODS USING C-PROGRAMMING LAB

L	T	P	Marks Practical
0	0	2	50

COURSE OUTCOMES **After Completion of this course the student will be able to: -**	
CO1	Implement Jordan Elimination Method using C.
CO2	Implement Newton-Raphson Method using C.
CO3	Implement Simpson's Rule using C.
CO4	Implement Gauss Elimination method using C.
CO5	Implement Newtonôs forward and backward interpolation using C.

Lab Experiments:

Experiment 1 Newtonôs Forward Interpolation formula
Experiment 2 Newtonôs Backward Interpolation formula
Experiment 3 Lagrangeôs Interpolation formula
Experiment 4 Trapezoidal Rule
Experiment 5 Simpsonôs Rule
Experiment 6 Newton-Raphsonôs Method
Experiment 7 Eular Method
Experiment 8 Jordan Elimination Method

NOTE: Additional Lab experiments/practicals will be performed based on the course contents requirements.

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

CLASS: B.E. 3RD SEMESTER **CREDIT: 1**
BRANCH: COMPUTER ENGINEERING
COURSE NO: MOC-314
COURSE TITLE: MooC

			Marks
L	**T**	**P**	**Practical**
0	**0**	**2**	**50**

MooC: 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. Here the students will have a choice to choose between Numerical Methods Lab and a MooC course.
To evaluate a MooCs course following is the scheme proposed:

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.)

The students can opt for MooC from the list provided here under. The choice of course opted is not restricted to the list, provided the opted course is approved by the department.

1. C#
2. C Sharp
3. Web Development
4. Python
5. PHP
6. Mobile Computing
7. Android
8. Programming using MATLAB
9. JavaScript Basics
10. Client Server Communication
11. Web Security Fundamentals
12. SQL

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

CLASS: B.E. 3RD SEMESTER **CREDITS: 0**
BRANCH: COMPUTER ENGINEERING
COURSE No: NCC-301
COURSE TITLE: CYBER ETHICS & LAWS

L	T	P	Marks
			Theory
2	0	0	Satisfactory/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.

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 — Justice Yatindra Singh
2. Cyber Laws and Crimes Simplified — Adv. Prasant Mali
3. Cyber Ethics 4.0 — 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.

ANNEXURE-1I

B.E Computer Engineering Fourth Semester Examination to be held in the Year May 2020, 2021, 2022, 2023

B.E. Computer Engineering 4th Semester **Contact Hrs: 28**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	Credits	% Change
			L	T	P	Internal	External			
BSC-401	Basic Science Course	Discrete Mathematics	2	1	0	50	100	150	3	100%
PCS-401	Professional Core Course	Data Structures	3	1	0	50	100	150	4	100%
PCS-402	Professional Core Course	RDBMS	3	1	0	50	100	150	4	100%
PCS-403	Professional Core Course	Computer Organization & Architecture	2	1	0	50	100	150	3	100%
PCS-404	Professional Core Course	Java Programming	2	1	0	50	100	150	3	100%
PCS-405	Professional Core Course	Digital Electronics	2	1	0	50	100	150	3	100%
PCS-411	Professional Core Course	Data Structures Lab	0	0	2	50	-	50	1	100%
PCS-412	Professional Core Course	RDBMS Lab	0	0	2	50	-	50	1	100%
PCS-414	Professional Core Course	Java Programming Lab	0	0	2	50	-	50	1	100%
PCS-415	Professional Core Course	Digital Electronics Lab	0	0	2	50	-	50	1	100%
TOTAL			**14**	**6**	**8**	**500**	**600**	**1100**	**24**	

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

CLASS: B.E. 4TH SEMESTER **CREDITS: 3**
BRANCH: COMPUTER ENGINEERING
COURSE NO. BSC-401
COURSE TITLE: DISCRETE MATHEMATICS
DURATION OF EXAM: 3 HOURS

			Marks	
L	**T**	**P**	**Theory**	**Sessional**
2	**1**	**0**	**100**	**50**

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Understand basic principles of sets and operations in sets.
CO2	Analyze relations and functions and be able to determine their properties.
CO3	Apply logical notation to describe an argument.
CO4	Evaluate the basics concepts of groups, its examples and related results.
CO5	Create graphs and trees using different transversal methods.

Detailed Syllabus

Section – A

Sets, Relation and Function: Operations and Laws of Sets, Cartesian Products, Finite and infinite sets, countable and uncountable sets, Binary Relation and its types, Functions and its types, Principles of Mathematical induction, Principle of inclusion and exclusion, pigeon-hole principle. **(12Hrs)**

Algebraic Structure: Groups and sub groups, related theorems, Cosets, Normal subgroups and Group homomorphism. Rings, Integral domains and fields: examples and related results. **(10 Hrs)**

Section – B

Graphs and Trees: Basic terminology, multi graphs and weighted graphs, connectivity, walk and path, circuits and cycles, shortest path in weighted graphs, Algorithm of shortest path. Hamiltonian and Eulerian paths and circuits, Eulerian graphs, Hamiltonian graphs, Konigsberg bridge problem, Chinese postman problem, Travelling salesperson problem, Planar graph and Eulerôs formula.
Trees and cutsets: Trees, rooted trees, path lengths in rooted trees, Spanning trees and cut sets. **(20 Hrs)**

BOOKS RECOMMENDED:

1. Discrete Mathematics and its Applications, Tata McGraw ï Hill — Kenneth H. Rosen
2. Discrete Mathematics with Applications,4th edition, Wadsworth Publishing Co. Inc. — Susanna S. Epp
3. Elements of Discrete Mathematics A Computer Oriented Approach, 3rd Edition by, Tata McGraw ï Hill — C L Liu and D P Mohapatra
4. Graph Theory — Narsingh Deo

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions 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. 4TH SEMESTER **CREDITS: 4**
BRANCH: COMPUTER ENGINEERING
COURSE NO. PCS-401
COURSE TITLE: DATA STRUCTURES
DURATION OF EXAM: 3 HOURS

			Marks	
L	**T**	**P**	**Theory**	**Sessional**
3	**1**	**0**	**100**	**50**

COURSE OUTCOMES	
At the end of the course the student will be able to: -	
CO1	For a given algorithm student will be able to analyze the algorithm to determine its Time and Space Complexity and to understand its relationship with Data Structures.
CO2	To understand basic concepts about Stacks, Queues, Lists, Trees and Graphs
CO3	To enable them to write algorithms for solving problems with the help of various fundamental Data Structures.
CO4	To understand and use different sorting and searching techniques and compare their performance in terms of Space and Time complexity

Detailed Syllabus

Section- A

Introduction to data structures: - Concepts of data and algorithm, Relation between Data Structure & Algorithm, Introduction to Time & Space complexity, Data types, Data Structures & Abstract data types, Representation of Arrays, Sparse matrices. **(2 Hrs)**

Stacks and Queues: - Concept of Stacks, Operation on Stacks, Multiple stacks, Application of stacks in Infix, Postfix, Prefix, Recursion, Concept of Queues, Operation on Queues, Multiple Queues, Priority Queues, Circular Queues. **(10Hrs)**

Linked Lists: - Insertion, Deletion and Traversal on Linear Linked Lists, Doubly Linked List, Circular Linked List, Linked List as Data Structure, Header nodes, Stacks & Queues using linked list, Dynamic memory management, Garbage Collection **(10Hrs)**

Section-B

Trees: -Binary trees and its representation using Linked list, Operations on Binary Trees, Traversal Algorithms, Applications, Threaded Binary Trees and its Traversal algorithms, Heterogeneous Binary Trees, List representation using Binary Trees, Optimum Search Trees, AVL trees. **(10Hrs)**

Graphs: -Representation of Graphs, Traversal methods, Applications Undirected Graphs, Directed Graph& their Traversal, Depth first, Breadth First, Shortest Path algorithms (Dijkstra and Floyd), Minimum Cost Spanning tree (Prim and Kruskal). **(8Hrs)**

Sorting &Searching:-

1. Exchange Sort (Bubble, Quicksort)
2. Selection & Tree Sorting.
3. Insertion sort, Shell Sort, Address Calculation Sort
4. Merge & Radix Sort.
5. Sequential Searching, searching an Ordered Table, Index sequential search, Binary search, Interpolation search, Tree searching. **(5Hrs)**

BOOKS RECOMMENDED:

1	Data Structure using C	Tenenbaum, Langsam, Augenstein
2	Fundamentals of data structures	Horowiz E. and Sahni S.
3	Data structures and Program Design	Robert L. Kruse.
4	Data Structures & Algorithm	Aho, Hopcraft and Ullman.
5	Data Structure with Applications	Sorenson.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions 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. 4TH SEMESTER **CREDITS: 4**
BRANCH: COMPUTER ENGINEERING
COURSE NO. PCS-402
COURSE TITLE: RDBMS
DURATION OF EXAM: 3 HOURS

			Marks	
L	**T**	**P**	**Theory**	**Sessional**
3	**1**	**0**	**100**	**50**

COURSE OUTCOMES	
At the end of the course the student will be able to: -	
CO1	Understand DBMS architecture, Physical and Logical Database Designs, Database Modeling, Relational, Hierarchical and Network Models.
CO2	Identify basic database storage structures and access techniques such as file organizations, indexing methods.
CO3	Apply Structured query language (SQL) for database definition and database manipulation.
CO4	Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
CO5	Write application programs dealing with issues like concurrency control and database protection mechanisms.

Detailed Syllabus

Section-A

Basic Concepts: - Data Modeling-Records and Files-Abstraction and data Integration-Views-Data Independence-Components of DBMS-Advantages and Disadvantages, Data Associations, Data Models Classification. **(4 Hrs)**

Entity Relationship Model: Basic concepts, constraints, design issues, Entity Relationship diagram, Week Entity sets, Extended ER features, Design of ER database schema, Reduction of ER schema to tables. **(6Hrs)**

Relational Model:- Attributes and domains, Tuples, Relations and Schemas, Relation representation, keys, Integrity Rules, Relational algebra, Relational Calculus, Data Manipulation using SQL. **(8 Hrs)**

Relational Data-base Design:-Normalization using Functional Dependency, Normalization using Join dependencies, Normalization using Join Dependencies, Domain key normal form. **(6 Hrs)**

Section-B

Transactions: Transaction concept, transaction state, implementation of Atomicity and Durability, Concurrent executions, Serializability, Recoverability, implementation of isolation, transaction definition in SQL. **(8 Hrs)**

Concurrency Control: Lock based protocols, Timestamp based protocols, Validation based protocols, Multiple Granularity, Multiversion Schemes, Deadlock Handling, Inset and Delete operations **(6 Hrs)**

Recovery Systems: Failure classification, Storage Structure, Recovery and Atomicity, Log based recovery, Shadow Paging, Recovery with Concurrent Transitions, Buffer Management. **(4 Hrs)**

BOOKS RECOMMENDED:

1. Database System Concepts — Korth,Silberchatzï TMH
2. An introduction to Database Systems — Bipin C. Desai
3. Principles of Data Base Management Systems — Aho Ullman
4. Oracle — Ivan Bayross.

NOTE:There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions 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 4TH SEMESTER **CREDIT: 3**
BRANCH: COMPUTER ENGINEERING
COURSE NO. PCS-403
COURSE TITLE: COMPUTER ORGANISATION AND ARCHITECTURE.
DURATION OF EXAM: 3 HOURS

			Marks	
L	**T**	**P**	**Theory**	**Sessional**
2	**1**	**0**	**100**	**50**

COURSE OUTCOMES	
At the end of the course the student will be able to: -	
CO1	Understand the basic architecture and operational concepts in designing CPU.
CO2	Analyze various component units (ALU & CU) and Organization of CPU.
CO3	Analyze various memories management techniques like Virtual Memory and Cache Memory.
CO4	Apply the concepts of Parallel Processing in designing high performance processors
CO5	Analyze the working of different types of Processors

Detailed Syllabus

Section-A

Introduction: - Basic structure of Computers, stored programme concept, Basic Operational concepts, Functional Units, Machine language, concept of memory locations, addresses, addressing modes. **(6 Hrs)**

Processing and execution: - Processing unit, execution of instructions, control step sequence, different types of instruction, ALU Design, Arithmetic Processes, Control Unit Design, Hardwired & Micro programmed Control Unit. **(6 Hrs)**

CPU: General Register Organization, Stack Organization, Instruction format, RISC, CISC. **(4Hrs)**

Input output organization: - I/O Systemsï Programmed Control, Interrupt controlled &DMAData Transfer Schemes, I/O Processors. Architecture(IOP). **(6 Hrs)**

Section-B

Memory Management: - Memory organization, Characteristics of memory size, Access time, Read/write cycle time, Sequential and Random access semiconductor memories, Virtual memory and its implementation, Cache memory and its types- Split and Unified, levels of Caches. **(8Hrs)**

Parallel processing – Basic Concepts, Types of parallel Processors, Pipelined processors, Pipelined Structures, Pipeline Hazards. **(6 Hrs)**

Introduction to Vector Processors, Array Processors, Multicore processors. **(6 Hrs)**

BOOKS RECOMMENDED:

1. Computer Architecture &Organization — John P. Hayes (Mc Graw Hill)
2. Computer System Architecture — Morris Mano
3. Computer System Architecture — V.K. Jain
3. Computer Organization — Carl V. Hamacher.
4. Digital Electronic — Malvino Brown.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions 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. 4TH SEMESTER **CREDIT-3**
BRANCH: COMPUTER ENGINEERING
COURSE NO: PCS-404
COURSE TITLE: JAVA PROGRAMMING
DURATION OF EXAM: 3 HOURS

			Marks	
L	**T**	**P**	**Theory**	**Sessional**
2	**1**	**0**	**100**	**50**

COURSE OUTCOMES	
At the end of the course the student will be able to: -	
CO1	Understand the concepts of Object-Oriented Programming paradigm and platform portability in Java.
CO2	Apply concepts of Classes, Objects and Methods to tackle real world problems.
CO3	Analyze errors and exceptions by using Exception Handling mechanism.
CO4	Examine the Multithreading techniques by extending Thread class and develop interface, Applets and Web pages
CO5	Create Graphic User Interface using Abstract Window Toolkit

Detailed Syllabus

Section – A

Java Evolution, And Overview of Java Language: Java Historyï Features of java, how java different from C and C++, Java and World Wide Web, Web Browser. Java Environment: Java Development kit (JDK), Application Programming Interface (API). Java Programming Structure, Java Tokens, Constants, Variables, Expressions, Decision Making Statements and Looping, Java Statements, Overview of Arrays and Strings, Machine Neutral, Java Virtual Machine (JVM), Command Line Arguments. **(6 Hrs)**

Arrays and Strings: Arrays, One-Dimensional arrays, Creating an Array, declaration of arrays, initialization of arrays, Two-Dimensional arrays, String arrays, String methods, String Buffer class, Vectors, Wrapper classes. **(4 Hrs)**

Classes, Objects and Methods: Introduction, defining a class, creating objects, accessing class members, constructors, methods overloading, static members. **(4 Hrs)**

Inheritance: Defining a sub class, sub class constructor, multilevel variables, Final classes, and Finalize methods, Abstract methods and classes, visibility control. **(4 Hrs)**

Managing Errors andExceptions: Introduction, Types of Errors-Compile time and Run time errors, Exceptions, Types of Exceptions, Syntax of Exception handling code, Multiple catch statements, using finally statement, Throwing our own exceptions. **(4 Hrs)**

Section- B

Multithreaded Programming: Introduction to threads, Creating Threads, Extending the Thread Class, Implementing the Runnable interface, life cycle of a thread, priority of a thread, synchronization, Deadlock. **(6Hrs)**

Interfaces and Applet Programming: Introduction, defining interfaces, extending interfaces, implementing interfaces. Introduction, how applet differ from applications, building applet code, applet life cycle, About HTML, designing a web page, passing parameters to applets**,**getting input from the User. **(6Hrs)**

Graphics Programming: Introduction, the Abstract Windowing Toolkit (AWT), frames, event-driven programming, layout managers, panels, canvasses, drawing geometric figures. Creating User Interface: Introduction, describe various user interface Components: button, label, text field, text area, choice, list, check box check box group. **(8Hrs)**

BOOKS RECOMMENDED:

1 Programming with JAVA — Balagurusamy TMH
2 An Introduction to JAVA Programming — Y.DanielLiangTMH
3 The Complete Reference JAVA 2 — Herbert Schield TMH

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions 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. 4TH SEMESTER **CREDITS: 3**
BRANCH: COMPUTER ENGINEERING
COURSE NO: PCS-405
COURSE TITLE: DIGITAL ELECTRONICS
DURATION OF EXAM: 3 HOURS

L	T	P	Marks: Theory	Marks: Sessional
2	1	0	100	50

COURSE OUTCOMES	
At the end of the course the student will be able to: -	
CO1	Understand the basics of number systems, logic Gates, Boolean laws & theorems.
CO2	Apply methods to simplify the Boolean functions to the minimum number of literals.
CO3	Design different types of combinational logic circuits using Logic gates.
CO4	Implement different types of sequential logic circuits using Flip Flops.
CO5	Construct different types of Counters and registers.

Detailed Syllabus
Section A

Digital Systems and Binary Numbers
Binary numbers, Number ï Base Conversions, Arithmetic operations using number system, Data Representation - fixed and floating, Complements (1ôs and 2ôs), Binary codes ï weighted/non-weighted codes, BCD codes, Excess-3-code, Grey codes, Conversion between codes, Code convertors Codes for error detection and correction (Hamming code). **(12 Hrs)**

Boolean algebra and Logic Simplification:
Boolean Algebra, Logical gates, Simplification of Boolean function using Boolean algebra, Karnaugh map (up to five variables), Quine Mcclusky Methods, Combinational Logic design -Half and Full adders, Half and full Subtractor, BCD Adder, Comparators. **(11Hrs)**

Section- B

Combinational circuits: Decoders, Encoders, Multiplexers, De-Multiplexers, Programmed logic devicesï Read only memory, Programmable Read only Memories (PROM) and Programmable Logic Arrays (PLA), Programmable Array Logic (PAL). **(10Hrs)**

Sequential logic design: Latches and Flip flops, conversion between flip flops, Shift Registers, Analysis of synchronous and asynchronous counters, Design of Sequential logic circuits, State Reduction and Assignment, ASM Charts. **(10Hrs)**

BOOKS RECOMMENDED:

1	Digital Design	Morris Mano
2	Digital Electronics	R.P Jain
3	Digital Logic Design	J.P. Hayes
4	Digital Logic Design	Brain Holdsworth
5	Digital Electronics & Circuits Design	Thomas Mac calla
6	Digital Electronics	R.K Gour

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions 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. 4TH SEMESTER **CREDIT: 1**
BRANCH: COMPUTER ENGINEERING
COURSE NO: PCS-411
COURSE TITLE: DATA STRUCTURES LAB

L	T	P	Marks Practical
0	0	2	50

COURSE OUTCOMES **After Completion of this course the student will be able to: -**	
CO1	Implement basic operations on Stacks,Queues, Linked list, Trees and Graphs
CO2	Able to use various Data Structures in Problem Solving.
CO3	Implement various sorting and searching techniques.

Lab Experiments:

Experiment 1	Write a program to check if expression is correctly parenthesized using Stacks
Experiment 2	Write a program to evaluate Postfix Expressionusing Stacks
Experiment 3	Write a program to convert Infix Expression to its corresponding Postfix andPrefix
Experiment 4	Write a program to convert Prefix Expression to Postfix
Experiment 5	Write a program to implement Circular Queue Operations
Experiment 6	Write a program to implement Priority Queue Operations
Experiment 7	Write a program to implement Ordered Linked List
Experiment 8	Write a program to add Polynomials using Single Linked List
Experiment 9	Write a program to implement operations on Doubly Linked List
Experiment 10	Write a program to find the duplicate numbers in a given list using Binary Tree
Experiment 11	Write a program to Sort a list of numbers using Binary Search Tree
Experiment 12	Write a program to implement operations on Threaded Binary Trees
Experiment 13	Write a program to implement QuickSort algorithm
Experiment 14	Write a program to implement ShellSort algorithm
Experiment 15	Write a program to implement Merge Sort algorithm

NOTE: Additional Lab experiments/practicalôs will be performed based on the course contents requirements.

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

CLASS: B.E. 4TH SEMESTER **CREDIT: 1**
BRANCH: COMPUTER ENGINEERING
COURSE NO: PCS-412
COURSE TITLE: RDBMS LAB.

L	T	P	Marks Practical
0	0	2	50

COURSE OUTCOMES **After Completion of this course the student will be able to: -**	
CO1	Code and implement queries regarding basic DDL,DML and DCL commands.
CO2	Use Aggregate and group functions to summarize data
CO3	Join multiple tables using different types of joins.
CO4	Analyze the PL/SQL architecture and write PL/SQL code for procedures, triggers, cursors, exception handling etc.

Lab Experiments:

Experiment 1 To create , insert and show the basic structure of a table emp with following specifications: Attribute:-emp_code (int), emp_name(varchar(50)), design(varchar), doj(date), basic_sal(int), dept_code(int).

Experiment 2 To show all entries of emp_name from table emp having and not having desig = admin and emp_code = 102.

Experiment 3 To show all design entries from table emp that are unique.

Experiment 4 To show all entries of emp_name from table emp having óAô in them

Experiment 5 To show all entries of emp_name, basic_sal from table emp and show by computing pf = basic_sal * 0.1, hra = basic_sal * 0.1, da = basic_sal * 0.1 and gross = basic_sal + da + hra ï pf for all values of basic_sal.

Experiment 6 To display the count value of emp_code and find
average of basic _sal for each dept_code.
count the value of emp_code for each dept_code and ordered by count emp_code.

Experiment 7 To display the emp_code, emp_name, desig, basic_sal from emp having basic_sal<= 9000 and design is sales.

Experiment 8 To show all entries of emp_name from table emp where
emp_code is either of 102, 104, 105, 107 and 108.
doj is between 01-jan-05 and 31-dec-12.

Experiment 9 To calculate the average, maximum and minimum of all entries of basic_sal.

Experiment 10 To add 200 to all values of basic_sal where desig is sales.

Experiment 11 To display all values of basic_sal and basic_sal2 from table emp

NOTE: Additional Lab experiments/practicals will be performed based on the course contents requirements.

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

CLASS: B.E. 4TH SEMESTER **CREDIT: 1**
BRANCH: COMPUTER ENGINEERING
COURSE NO: PCS-414
COURSE TITLE: JAVA PROGRAMMING LAB.

L	T	P	Marks Practical
0	0	2	50

COURSE OUTCOMES **After Completion of this course the student will be able to: -**	
CO1	Understand various Java Tokens, Constants, Variables, Expressions, Decision Making and Looping Statements in java.
CO2	Implement the concepts for creating Arrays and Strings objects in java.
CO3	Implement the concept of constructor, Destructor, Static members method overloading and multithreading in java.
CO4	Manage Errors and Exceptions using Exception handling mechanism and code to implement interfaces and applets.
CO5	Design window frame using various GUI components like Buttons, Text fields, menu, check list and check boxes.

Lab Experiments:

Experiment 1	WAP To use different arithmetic operation in java.
Experiment 2	WAP To demonstrate wrapper class in java.
Experiment 3	WAP to perform manipulation on strings in java.
Experiment 4	WAP to demonstrate single inheritance in java.
Experiment 5	WAP to demonstrate multiple inheritance using interface in java
Experiment 6	WAP to demonstrate Exception handling in java
Experiment 7	WAP to check whether the entered amount is is sufficient or not ,if not raise an exception in java
Experiment 8	WAP to demonstrate threads in java.
Experiment 9	WAP to demonstrate APPLET in java.
Experiment 10	WAP to demonstrate event handling in java.

NOTE: Additional Lab experiments/practicals will be performed based on the course contents requirements.

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

CLASS: B.E. 4TH SEMESTER **CREDIT: 1**
BRANCH: COMPUTER ENGINEERING
COURSE NO: PCS-415
COURSE TITLE: DIGITAL ELECTRONICS LAB.

L	T	P	Marks Practical
0	0	2	50

COURSE OUTCOMES **After Completion of this course the student will be able to: -**	
CO1	Implement logic gates and realization of OR, AND, NOT AND XOR Functions using universal gates.
CO2	Design and implement combinational circuits like half adder/full adder, half subtractor/full subtraction, code converters, comparators, MUX/DEMUX.
CO3	Design and implement sequential circuits like flip-flops, counters and shift registers.

Lab Experiments:

Experiment 1	Verification of truth table of basic gates.
Experiment 2	Verification of truth tables of ADDER/SUBTRACTER using IC-7483
Experiment 3	Verification of truth tables of MULTIPLEXER/DEMULTIPLEXER
Experiment 4	Verification of truth tables of BCD ï 7- Segment Display
Experiment 5	Verification of truth tables of Code Conversion.
Experiment 6	Design of Flip-Flops using IC chips
Experiment 7	Design of Twoôs complement circuits using shift registers
Experiment 8	Design and Implementation of Asynchronous MOD-12 counters.
Experiment 9	Design of a sequential circuit
Experiment 10	Study of PLA'S and PAL's.

NOTE: Each student has to perform at least 8 experiments out of which 40% shall be simulation based.

NOTE: Additional Lab experiments/practicals will be performed based on the course contents requirements.