MADHYANCHAL

PROFESSIONAL UNIVERSITY

Syllabus for the

Bachelor of Science in

Computer Science

Semester I

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted								Hours per week			Total Credits	Remarks
			Theory				Practical								
			End Sem	Mid Sem. MST	Quiz, Assignment	Total Marks	Lab Work	Assignment /Quiz/Term paper	End Sem	Total Marks	L	T	P		One credit refers to one hour teaching in theory, Tutorial
1	BSCCS101	Physics-I	60	20	20	100	20	10	20	50	3	1	2	6	
2	BSCCS102	Basic Computers	60	20	20	100	20	10	20	50	3	1	2	6	
3	BSCCS103	Mathematics -I	60	20	20	100	-	-	-		5	1	-	6	
4	BSCFC104	Communicative English	60	20	20	100	-	-	-	-	4	-	-	4	
5	BSCFC105	Communicative Hindi	60	20	20	100	-	-	-	-	4	-	-	4	
		Total	300	100	100	**500**	40	20	40	**100**	19	3	4	26	**600**

Semester II

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted								Hours per week			Total Credits	Remarks
			Theory				Practical								
			End Sem	Mid Sem. MST	Quiz, Assignment	Total Marks	Lab Work	Assignment /Quiz/Term paper	End Sem	Total Marks	L	T	P		One credit refers to one hour teaching in theory, Tutorial
1	BSCCS201	Physics-II	60	20	20	100	20	10	20	50	3	1	2	6	
2	BSCCS202	Computer Organigation	60	20	20	100	20	10	20	50	3	1	2	6	
3	BSCCS203	Mathematics-II	60	20	20	100	-	-	-	-	5	1	-	6	
4	BSCFC204	Environmental Science	60	20	20	100	-	-	-	-	4	-	-	4	
5	BSCFC205	Enterprenureship Development	60	20	20	100					4	-	-	4	
		Total	300	100	100	**500**	40	20	40	**100**	19	3	4	26	**600**

SEMESTER III

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted								Hours per week			Total Credits	Remarks
			Theory				Practical								
			End Sem	Mid Sem. MST	Quiz, Assignment	Total Marks	Lab Work	Assignment /Quiz/Term paper	End Sem	Total Marks	L	T	P		One credit refers to one hour teaching in theory, Tutorial
1	BSCCS301	Physics-III	60	20	20	100	20	10	20	50	4	0	2	6	
2	BSCCS302	Fundamentals of Digital Computers	60	20	20	100	20	10	20	50	4	0	2	6	
3	BSCCS303	Mathematics-III	60	20	20	100	20	10	20	50	5	1	0	6	
4	BSCFC304	Aptitude -I	60	20	20	100	-	-	-	-	3	1	-	4	
5	BSCFC305	Computer Application	60	20	20	100	-	-	-	-	3	1		4	
		Total	300	100	100	500	60	30	60	150	19	3	4	26	650

SEMESTER IV

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted								Hours per week			Total Credits	Remarks
			Theory				Practical								
			End Sem	Mid Sem. MST	Quiz, Assignment	Total Marks	Lab Work	Assignment /Quiz/Term paper	End Sem	Total Marks	L	T	P		One credit refers to one hour teaching in theory, Tutorial
1	BSCCS401	Physics-IV	60	20	20	100	20	10	20	50	4	0	2	6	
2	BSCCS402	DBMS	60	20	20	100	20	10	20	50	4	0	2	6	
3	BSCCS403	Mathematics-IV	60	20	20	100	20	10	20	50	5	1	0	6	
4	BSCFC404	Internet Fundamentals And Web Tools	60	20	20	100	-	-	-	-	3	1	-	4	
5	BSCFC405	Aptitude - II	60	20	20	100	-	-	-	-	3	1		4	
		Total	300	100	100	500	60	30	60	150	19	3	4	26	650

SEMESTER V

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted								Hours per week			Total Credits	Remarks
			Theory				Practical								
			End Sem	Mid Sem. MST	Quiz, Assignment	Total Marks	Lab Work	Assignment /Quiz/Term paper	End Sem	Total Marks	L	T	P		One credit refers to one hour teaching in theory, Tutorial
1	BSCS501	Physics-V	60	20	20	100	20	10	20	50	4	0	2	6	
2	BSCS502	Data communication & network	60	20	20	100	20	10	20	50	4	0	2	6	
3	BSCS503	Maths-V	60	20	20	100	20	10	20	50	5	1	0	6	
4	BSCS504	Hindi Language (Bhasha Kaushal aur Sanchar Sadhan)	60	20	20	100	-	-	-	-	3	1	-	4	
5	BSCS505	Visual Basic	60	20	20	100	-	-	-	-	3	1		4	

SEMESTER VI

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted								Hours per week			Total Credits	Remarks
			Theory				Practical								
			End Sem	Mid Sem. MST	Quiz, Assignment	Total Marks	Lab Work	Assignment /Quiz/Term paper	End Sem	Total Marks	L	T	P		
1	BSCS601	Physics-VI	60	20	20	100	20	10	20	50	4	0	2	6	One credit refers to one hour teaching in theory, Tutorial
2	BSCS602	Web development	60	20	20	100	20	10	20	50	4	0	2	6	
3	BSCS603	Maths-VI	60	20	20	100	20	10	20	50	5	1	0	6	
4	BSCS604	English Language and Aspects of Development	60	20	20	100	-	-	-	-	3	1	-	4	
5	BSCS605	DBMS	60	20	20	100	-	-	-	-	3	1		4	

Semester-I
BSCCS101 Physics-I

Unit-I

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. Ordinary Differential Equations:1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. Laws of Motion: Frames of reference. Newton's Laws of motion. Dynamics of asystem of particles. Centre of Mass.

Unit-II.

Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum.

Unit-III

Gravitation: Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS).

Unit-IV

Oscillations: Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations.

Unit-V

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion – Torsional pendulum-Determination of Rigidity modulus and moment of inertia - q, η and $\square$by Searles method. Special Theory of Relativity: Constancy of speed of light. Postulates of Special. Theory of Relativity. Length contraction. Time dilation. Relativistic addition of
velocities.

Reference Books:

- University Physics. FW Sears, MW Zemansky and HD Young13/e, 1986. Addison-Wesley
- Mechanics Berkeley Physics course,v.1: Charles Kittel, et. Al. 2007, Tata McGraw- Hill.
- Physics – Resnick, Halliday & Walker 9/e, 2010, Wiley
- Engineering Mechanics, Basudeb Bhattacharya, Oxford University Press
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.

BSCCS101 Physics-I PRACTICALS

LIST OF PRACTICALS

1. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope.

2. To determine the Height of a Building using a Sextant.

3. To determine the Moment of Inertia of a Flywheel.

4. To determine the Young's Modulus of a Wire by Optical Lever Method.

5. To determine the Modulus of Rigidity of a Wire by Maxwell's needle.

6. To determine the Elastic Constants of a Wire by Searle's method.

7. To determine g by Bar Pendulum.

8. To determine g by Kater's Pendulum.

9. To determine g and velocity for a freely falling body using Digital Timing   Technique

10. To study the Motion of a Spring and calculate (a) Spring Constant (b) Value of g.

BSCCS102 BASIC COMPUTERS

UNIT I
Evolution of Computers - Generations, Types of computers, Computer system characteristics, Basic components of a Digital Computer - Control unit, ALU, Input/Output functions and memory, Memory addressing capability of a CPU, Word length of a computer, processing speed of a computer, Computer Classification.

UNIT II
Input/Output Units-: Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers & types - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers.

UNIT III
RAM, ROM, EPROM, PROM and other types of memory, Storage fundamentals - Primary Vs Secondary Data Storage, Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive, flash drives Video Disk , Blue Ray Disc, SD/MMC Memory cards, Physical structure of floppy & hard disk, drive naming conventions in PC. DVD, DVD-RW, USB Pen drive.

UNIT IV
Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Algorithms , Flow Charts - Symbols, Rules for making Flow chart, Programming languages, Assemblers, Compilers and Interpreter, Computer Applications in Business.

UNIT V
Introduction to Internet, Connecting to the Internet Hardware , Software & ISPs, Search Engines, Web Portals, Online Shopping, Email – Types of email, Compose and send a message. Reply to a message, working with emails.

TEXT BOOKS
1.Computer Fundamentals – B. Ram – New Age International Publishers
2.S.K.Basandra, "Computers Today ", Galgotia Publications.
3.Computer Fundamentals – P. K. Sinha – BPB Publication
4.PC Software – Shree Sai Prakashan, Meerut

BSCCS102 BASIC COMPUTERS PRACTICALS

List of Practicals

1. Create a new folder and files
2. Implement the various well known features of Windows operating system such as Notepad, WordPad, Paint, System tools, Entertainment etc. enclosed in Start→Programs→Accessories.
3. Implement various display properties by right clicking on the Windows Desktop.
4. Explore the taskbar of Windows.
5. Set the wall paper and screen saver.
6. Set the data/time.
7. Create a document
8. Implement the concept of mail merge.
9. Implement the concept of macros.
10. Implement the concept of importing a file/document.
11. Implement the concept of merging the documents.
12. Crate a table
13. Create your resume using General Templates.

BSCCS103- Mathematics-I

Unit-I : Differential Calculus

- Limit and Continuity (ε and δ definition), Types of discontinuities, Differentiability of functions, Successive differentiation, Leibnitz's theorem, Partial differentiation,
- Euler's theorem on homogeneous functions.
- Tangents and normals, Curvature, Asymptotes, Singular points, Tracing of curves.
- Parametric representation of curves and tracing of parametric curves, Polar
- coordinates and tracing of curves in polar coordinates.
- Rolle's theorem, Mean Value theorems, Taylor's theorem with Lagrange's and
- Cauchy's forms of remainder, Taylor's series, Maclaurin's series of sin x, cos x, ex,
- log (l+x), (l+x)m, Maxima and Minima, Indeterminate forms.

Unit-II: Differential Equations

- First order exact differential equations. Integrating factors, rules to find an integrating
- factor. First order higher degree equations solvable for x, y, p. Methods for solving
- higher-order differential equations. Basic theory of linear differential equations,
- Wronskian, and its properties. Solving a differential equation by reducing its order.
- Linear homogenous equations with constant coefficients, Linear non-homogenous
- equations, The method of variation of parameters, The Cauchy-Euler equation,
- Simultaneous differential equations, Total differential equations.
- Order and degree of partial differential equations, Concept of linear and non-linear
- partial differential equations, Formation of first order partial differential equations,
- Linear partial differential equation of first order, Lagrange's method, Charpit's
- method. Classification of second order partial differential equations into elliptic, parabolic and hyperbolic through illustrations only.

Unit-III: Real Analysis
- Finite and infinite sets, examples of countable and uncountable sets. Real line,
- bounded sets, suprema and infima, completeness property of R, Archimedean
- property of R, intervals. Concept of cluster points and statement of Bolzano-
- Weierstrass theorem.
- Real Sequence, Bounded sequence, Cauchy convergence criterion for sequences.
- Cauchy's theorem on limits, order preservation and squeeze theorem, monotone sequences and their convergence (monotone convergence theorem without proof).Infinite series. Cauchy convergence criterion for series, positive term series, geometric series, comparison test, convergence of p-series, Root test, Ratio test, alternating series, Leibnitz's test (Tests of Convergence without proof). Definition and examples of absolute and conditional convergence.
- Sequences and series of functions, Pointwise and uniform convergence. Mn-test, Mtest. Statements of the results about uniform convergence and integrability and differentiability of functions, Power series and radius of convergence.

Unit-IV Algebra
- Definition and examples of groups, examples of abelian and non-abelian groups, the

group Zn of integers under addition modulo n and the group U(n) of units undermultiplication modulo n. Cyclic groups from number systems, complex roots of unity,circle group, the general linear group GLn (n,R), groups of symmetries of (i) anisosceles triangle, (ii) an equilateral triangle, (iii) a rectangle, and (iv) a square, thepermutation group Sym (n), Group of quaternions.Subgroups, cyclic subgroups, the concept of a subgroup generated by a subset and the commutator subgroup of group, examples of subgroups including the center of a group. Cosets, Index of subgroup, Lagrange's theorem, order of an element, Normal subgroups: their definition, examples, and characterizations, Quotient groups. Definition and examples of rings, examples of commutative and non-commutative rings: rings from number systems, Zn the ring of integers modulo n, ring of real quaternions, rings of matrices, polynomial rings, and rings of continuous functions.

- Subrings and ideals, Integral domains and fields, examples of fields: Zp, Q, R, and C. Field of rational functions.

UNIT V: Matrices, Analytical Geometry and Integral Calculus

- R, R2, R3 as vector spaces over R. Standard basis for each of them. Concept of Linear, Independence and examples of different bases. Subspaces of R2, R3.
- Translation, Dilation, Rotation, Reflection in a point, line and plane. Matrix form of basic geometric transformations. Interpretation of eigen values and eigen vectors for such transformations and eigen spaces as invariant subspaces.
- Types of matrices. Rank of a matrix. Invariance of rank under elementary transformations. Reduction to normal form, Solutions of linear homogeneous and non-homogeneous equations with number of equations and unknowns upto four.
- Matrices in diagonal form. Reduction to diagonal form upto matrices of order 3.
- Computation of matrix inverses using elementary row operations. Rank of matrix.

- Techniques for sketching parabola, ellipse and hyperbola. Reflection properties of parabola, ellipse and hyperbola.
- Classification of quadratic equations representing lines, parabola, ellipse and hyperbola.
- Spheres, Cylindrical surfaces. Illustrations of graphing standard quadric surfaces like cone, ellipsoid.
- Integration by Partial fractions, integration of rational and irrational functions.
- Properties of definite integrals. Reduction formulae for integrals of rational, trigonometric, exponential and logarithmic functions and of their combinations.
- Areas and lengths of curves in the plane, volumes and surfaces of solids of revolution. Double and Triple integrals.

Books Recommended

1. G.B. Thomas and R.L. Finney, *Calculus*, 9th Ed., Pearson Education, Delhi, 2005.
2. H. Anton, I. Bivens and S. Davis, *Calculus*, John Wiley and Sons (Asia) P. Ltd., 2002.
3. R.P. Grimaldi, *Discrete Mathematics and Combinatorial Mathematics*, Pearson Education, 1998.
4. P.R. Halmos, *Naive Set Theory*, Springer, 1974.
5. E. Kamke, *Theory of Sets*, Dover Publishers, 1950.
6. John B. Fraleigh, *A First Course in Abstract Algebra*, 7th Ed., Pearson, 2002.
7. M. Artin, *Abstract Algebra*, 2nd Ed., Pearson, 2011.
8. Joseph A Gallian, *Contemporary Abstract Algebra*, 4th Ed., Narosa, 1999.
9. G.B. Thomas and R.L. Finney, *Calculus*, 9th Ed., Pearson Education, Delhi, 2005.
10. H. Anton, I. Bivens and S. Davis, *Calculus*, John Wiley and Sons (Asia) Pvt. Ltd., 2002.

BSCFC104 Communicative English

Unit I: Vocabulary Building
1a. Prefixes and Suffixes
1b. Conversion
1c. Compounding
1d. Analogy
2. One-Word Substitutes
3. Words Often Confused
4. Synonyms and Antonyms
5. Phrasal Verbs

Unit II: Grammar - 1
1. Types of Verbs
2. Subject-Verb Agreement

Unit III: Grammar - 2
1. Meanings of Modals
2. Tense (Present and Past) and Aspect
3. The Several Possibilities for Denoting Future Time
4. Articles and Prepositions

Unit IV: Listening Skills
1. The Importance of Listening
2. Types of Listening
3. Barriers/Obstacles to Effective Listening
4. Strategies for Effective Listening

Unit V: Reading Skills
1. Skimming
2. Scanning

BSCFC105 Communicative Hindi

Unit-I	हिन्दी भाषा
	1. स्वतंत्रता पुकारती (कविता) – जयशंकर प्रसाद
	2. पुष्प की अभिलाषा (कविता) – माखनलाल चतुर्वेदी
	3. वाक्य संरचना और अशुद्धियां (संकलित)
Unit-II	हिन्दी भाषा
	1. नमक का दरोगा (कहानी) – प्रेमचंद
	2. एक थे राजा भोज (निबंध) – डॉ. त्रिभुवननाथ शुक्ल
	3. पर्यायवाची, विलोम, एकार्थी, अनेकार्थी एवं शब्दयुग्म शब्द (संकलित)
Unit-III	हिन्दी भाषा
	1. भगवान बुद्ध (निबंध) – स्वामी विवेकानंद
	2. लोकतंत्र एक धर्म है (निबंध) – डॉ. सर्वपल्ली राधाकृष्णन
	3. नहीं रूकती है नदी – हीरालाल बाछोतिया
	4. पल्लवन
Unit-IV	हिन्दी भाषा
	1. अफसर (निबंध) – शरद जोशी
	2. हमारी सांस्कृतिक एकता (निबंध) – रामधारी सिंह दिनकर (एक भारत श्रेष्ठ भारत के अन्तर्गत)
	3. संक्षेपण (संकलित)
Unit-V	नैतिक मूल्य
	1. नैतिक मूल्य परिचय एवं वर्गीकरण (आलेख) – डॉ. शशि राय
	2. आचरण की सभ्यता (निबंध) – सरदार पूर्णसिंह
	3. अंतर्ज्ञान और नैतिक जीवन (लेख) – डॉ. सर्वपल्ली राधाकृष्णन
	4. अप्प दीपो भव (लेख) – स्वामी श्रद्धानंद

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Semester II
BSCCS201 Physics-II

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UNIT-I
Vector Analysis: Review of vector algebra (Scalar and Vector product), gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors(statement only).

UNIT-II
Electrostatics: Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, chargedconductor. Electric potential as line integral of electric field, potential due to a pointcharge, electric dipole, uniformly charged spherical shell and solid sphere. Calculationof electric field from potential. Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric.

UNIT-III
Magnetism:
Magnetostatics: Biot-Savart's law & its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law.

UNIT-IV
Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para- and ferro-magnetic materials. Electromagnetic Induction: Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field.

UNIT-V
Maxwell`s equations and Electromagnetic wave propagation: Equation of continuity of current, Displacement current, Maxwell's equations, Poynting vector, energy density in electromagnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves, polarization.

Reference Books:
- Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education..
- Electricity and Magnetism, J.H. Fewkes & J. Yarwood. Vol. I, 1991, Oxford Univ.Press.
- Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.   12
- D.J. Griffiths, Introduction to Electrodynamics, 3rd Edn, 1998, Benjamin Cummings.

BSCCS201 Physics-II
PRACTICAL

List of Practicals

1. To use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, and (d) checking electrical fuses.
2. Ballistic Galvanometer:
(i) Measurement of charge and current sensitivity
(ii) Measurement of CDR
(iii) Determine a high resistance by Leakage Method
(iv) To determine Self Inductance of a Coil by Rayleigh's Method.
3. To compare capacitances using De'Sauty's bridge.
4. Measurement of field strength B and its variation in a Solenoid (Determine dB/dx).
5. To study the Characteristics of a Series RC Circuit.
6. To study the a series LCR circuit and determine its (a) Resonant Frequency, (b) Quality Factor
7. To study a parallel LCR circuit and determine its (a) Anti-resonant frequency and (b) Quality factor Q
8. To determine a Low Resistance by Carey Foster's Bridge.
9. To verify the Thevenin and Norton theorem
10. To verify the Superposition, and Maximum Power Transfer Theorem

BSCCS202 COMPUTER ORGANIZATIONS

UNIT I
Number systems – Decimal Number system, Binary number system, Octal & Hexa-decimal number system,1's & 2's complement, Binary Fixed- Point Representation, Arithmetic operation on Binary numbers, Overflow & underflow.

UNIT II
Floating Point Representation, Codes, ASCII, EBCDIC codes, Gray code, Excess-3 & BCD, Error detection & correcting codes, Logic Gates, AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates.

UNIT III
Flip-flops - RS, D, JK & T Flip-flops, Registers, Shift Registers, Multiplexer, De-multiplexer, Encoder, Decoder , Counters.

UNIT IV
Boolean Algebra – Basic Operations and Boolean Law's, Demorgan's theorem, K -Map, Sum of Product & Product of Sum. Combinational & Sequential circuits, Half Adder & Full Adder, Adder & Subtractor.

UNIT V
DMA- control signals for DMA transfers,Block diagram of DMA controller, DMA transfer in a microcomputer system. Instruction Sets – Characteristics and Functions, Types of Operations Addressing modes and formats, Processor Organization, Instruction Cycle, and Register Organization.

REFERENCE BOOKS
 1. William Stallings, "Computer Organization & Architecture", Pearson.
2. BARTEE, "Digital Computer Fundamentals " TMH Publication 3. MORRIS MA
3. Computer Fundamentals – B. Ram – New Age International Publishers

BSCCS202 COMPUTER ORGANIZATIONS- PRACTICAL

List of Practicals

1. Study of AND,OR and NOT gates.
2. Study of NAND,NOR and EX-OR gates.
3. Simplify Any Expression and Make truth table for it and verify.
4. Using NAND gate Design AND,OR & NOT gate. Using NOR gate Design AND, OR & NOT gate.
5. Study of Decoder.
6. Study of Multiplexer.
7. Study of Half adder and Full adder.
8. Study of Half Subtractor and Full Subtractor.
9. Study of R-S , D Filp Flop
10. Study of JK , JK M/S and T-Flip Flop.
11. **Study of Asynchronous Binary Counter**

BSCCS203 Mathematics-II

UNIT-I
Vector Calculus
- Differentiation and partial differentiation of a vector function. Derivative of sum, dot product and cross product of two vectors. Gradient, divergence and curl.

UNIT-II
Theory of Equations
- General properties of polynomials, Graphical representation of a polynomials, maximum and minimum values of a polynomials, General properties of equations,
- Descarte's rule of signs positive and negative rule, Relation between the roots and the coefficients of equations.
- Symmetric functions, Applications symmetric function of the roots, Transformation of equations. Solutions of reciprocal and binomial equations. Algebraic solutions of the cubic and biquadratic. Properties of the derived functions.

UNIT-III
Number Theory
- Division algorithm, Lame's theorem, linear Diophantine equation, fundamental theorem of arithmetic, prime counting function, statement of prime number theorem,
- Goldbach conjecture, binary and decimal representation of integers, linear congruences, complete set of residues.
- Number theoretic functions, sum and number of divisors, totally multiplicative functions, definition and properties of the Dirichlet product, the Möbius inversion formula, the greatest integer function, Euler's phi-function.

Probability and Statistics
- Sample space, probability axioms, real random variables (discrete and continuous), cumulative distribution function, probability mass/density functions, mathematical expectation, moments, moment generating function, characteristic function, discrete distributions: uniform, binomial, Poisson, continuous distributions: uniform, normal, exponential.
- Joint cumulative distribution function and its properties, joint probability density functions, marginal and conditional distributions, expectation of function of two random variables, conditional expectations, independent random variables.

UNIT-IV
Mathematical Finance
- Basic principles: Comparison, arbitrage and risk aversion, Interest (simple and compound, discrete and continuous), time value of money, inflation, net present value, internal rate of return (calculation by bisection and Newton-Raphson methods), comparison of NPV and IRR. Bonds, bond prices and yields. Floating-rate bonds, immunization.
- Asset return, short selling, portfolio return, (brief introduction to expectation, variance, covariance and correlation), random returns, portfolio mean return and variance, diversification, portfolio diagram, feasible set, Markowitz model (review of Lagrange multipliers for 1 and 2 constraints).

Mathematical Modeling
- Applications of differential equations: the vibrations of a mass on a spring, mixture

problem, free damped motion, forced motion, resonance phenomena, electric circuit problem, mechanics of simultaneous differential equations.

- Applications to Traffic Flow. Vibrating string, vibrating membrane, conduction of heat in solids, gravitational potential, conservation laws.

Boolean Algebra

- Definition, examples and basic properties of ordered sets, maps between ordered sets, duality principle, maximal and minimal elements, lattices as ordered sets, complete lattices, lattices as algebraic structures, sublattices, products and homomorphisms.
- Definition, examples and properties of modular and distributive lattices, Boolean algebras, Boolean polynomials, minimal forms of Boolean polynomials, Quinn-
- McCluskey method, Karnaugh diagrams, switching circuits and applications of switching circuits.

UNIT-V

Transportation and Game Theory

- Transportation problem and its mathematical formulation, northwest-corner method, least cost method and Vogel approximation method for determination of starting basic solution, algorithm for solving transportation problem, assignment problem and its mathematical formulation, Hungarian method for solving assignment problem.
- Game theory: formulation of two person zero sum games, solving two person zero sum games, games with mixed strategies, graphical solution procedure.

Graph Theory

- Definition, examples and basic properties of graphs, pseudographs, complete graphs,
- bi-partite graphs, isomorphism of graphs, paths and circuits, Eulerian circuits,
- Hamiltonian cycles, the adjacency matrix, weighted graph, travelling salesman's
- problem, shortest path, Dijkstra's algorithm, Floyd-Warshall algorithm.

Books Recommended:
1. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, *Linear Programming and Network Flows,* 2nd Ed., John Wiley and Sons, India, 2004.
2. F. S. Hillier and G. J. Lieberman, *Introduction to Operations Research,* 9th Ed., Tata McGraw Hill, Singapore, 2009.
3. Hamdy A. Taha, *Operations Research, An Introduction,* 8th Ed., Prentice-Hall India, 2006.
1. David M. Burton, *Elementary Number Theory* 6th Ed., Tata McGraw-Hill Edition, Indian reprint, 2007.
2. Richard E. Klima, Neil Sigmon, Ernest Stitzinger, *Applications of Abstract Algebra with Maple*, CRC Press, Boca Raton, 2000.
3. Neville Robinns, *Beginning Number Theory,* 2nd Ed., Narosa Publishing House Pvt. Limited, Delhi, 2007.

BSCFC204 ENVIRONMENTAL STUDIES

Unit-I : Natural Resources: Definition, scope and importance. Need for public awareness.
Brief description of;

1. Forest recourses: Use and over-exploitation. Deforestation; timber extraction, mining, dams. Effect of deforestation environment and tribal people
2. Water resources: Use and over–utilization. Effects of over utilisation of surface and ground water. Floods, drought.
3. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.
4. Food resources: World food problems, Effects of modern agriculture; fertilizer-pesticide, salinity problems. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.
5. Land resources: Land as resources, land degradation, man induced landslides, soil erosion and desertification

Unit-II: Ecosystems, Biodiversity and its conservation

1. Concept of an ecosystem
2. Structure and function of an ecosystem
3. Producers, consumers and decomposers
4. Food chains, food webs and ecological pyramids
5. Characteristic features of the following ecosystems:-
6. Forest ecosystem, Desert ecosystem, Aquatic ecosystem.
7. Value of biodiversity: Consumptive use, productive use. Biodiversity in India.
8. Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts.
9. Endangered and endemic species of India
10. Conservation of biodiversity

Unit-III: Environmental Pollution

1. Definition
2. Causes, effects and control measures of :-
3. Air pollution
4. Water pollution
5. Soil pollution
6. Noise pollution
7. Solid waste management; Measures for safe urban and industrial waste disposal
8. Role of individual in prevention of pollution
9. Disaster management: Drought, floods and cyclones

Unit-IV: Social Issues and the Environment

1. From Unsustainable to Sustainable development
2. Water conservation, rain water harvesting, watershed management.
3. Climate change, global warming, ozone layer depletion,
4. Environment protection Act

5. Wildlife Protection Act, Forest Conservation Act

Unit-V : Human Population and the Environment
   1. Population explosion, impact on environment.
   2. Family welfare Programme.
   3. Environment and human health.
   4. Women and Child Welfare.
   5. Value Education.
   6. Role of Information Technology in Environment and humanhealth.

Reference Books:

1.Environmental Studies by Dr.M.Satyanarayana, Dr. M.V. R.K.Narasimhacharyulu, Dr.G. Rambabu and Dr.V.VivekaVardhani, Published by Telugu Academy, Hyderabad.
2.Environmental Studies by R.C.Sharma, Gurbir Sangha, published by Kalyani Publishers.
3.Environmental Studies by Purnima Smarath, published by Kalyani Publishers

BSCFC205 ENTREPRENEURSHIP DEVELOPMENT

Unit-I:
Entrepreneurship: Entrepreneur characteristics – Classification of Entrepreneurships – Incorporation of Business – Forms of Business organizations –Role of Entrepreneurship in economic development –Start-ups.

Unit-II:
Idea Generation and Opportunity Assessment: Ideas in Entrepreneurships – Sources of New Ideas – Techniques for generating ideas – Opportunity Recognition – Steps in tapping opportunities.

Unit-III:
Project Formulation and Appraisal : Preparation of Project Report –Content; Guidelines for Report preparation – Project Appraisal techniques –economic – Steps Analysis; Financial Analysis; Market Analysis; Technical Feasibility.

Unit-IV:
Institutions Supporting Small Business Enterprises: Central level Institutions: NABARD; SIDBI, NIC, KVIC; SIDIO; NSIC Ltd; etc. – state level Institutions –DICs- SFC- SSIDC-Other financial assistance.

Unit-V:
Government Policy and Taxation Benefits: Government Policy for SSIs- tax Incentives and Concessions –Non-tax Concessions –Rehabilitation and Investment Allowances.

Reference Books:
1. Arya Kumar, Entrepreneurship, Pearson, Delhi, 2012.
2. Poornima M.CH., Entrepreneurship Development –Small Business Enterprises, Pearson, Delhi,2009
3. Michael H. Morris, ET. al., Entrepreneurship and Innovation, Cen gage Learning, New Delhi, 2011
4. Kanishka Bedi, Management and Entrepreneurship, Oxford University Press, Delhi, 2009
5. Anil Kumar, S., ET.al., Entrepreneurship Development, New Age International Publishers, New Delhi, 2011
6. Khanka, SS, Entrepreneurship Development, S. Chand, New Delhi.

III SEMESTER

BSCCS301 Physics-III

Subject Code	Subject Name	Credits	Maximum marks Allotted					Total	Duration of Exam.	
			Theory			Practical			Theory	Practical
			End Sem	Mid Sem	Assi gn.	End Sem	Term work			
BSCCS3 01	Physics-III	6 (4-0-2)	60	20	20	20	30	150	3 hr	3 hr

OBJECTIVE

To explain students about theories of Ideal Gas, Real Gas: Van der Waals gas.

To explain laws of entropy and thermodynamics, Different versions of the second law and Thermodynamic relationships. Statistical Physics statistical basis of thermodynamics.

UNIT-I

Kinetic Theory of Gases: Ideal Gas: Kinetic model, deduction of Boyle's law, interpretation of temperature, estimation of rms speeds of molecules. Brownian motion, estimate of the Avogadro number. Law of Equipartition of energy, specific heat of monatomic gas, extension to di- and tri-atomic gases, behavior at low temperatures. Adiabatic expansion of an ideal gas, applications to atmospheric physics. Real Gas: Van der Waals gas, Equation of state, nature of Van der Waals forces, comparison with experimental P-V curves. The critical constants; gas and vapour. Joule expansion of ideal gas and Vander Waals gas, Joule coefficient, estimates of J-T cooling.Liquefaction of gases: Boyle temperature and inversion temperature. Principle of regenerative cooling, liquefaction of hydrogen and helium. Refrigeration cycle, meaning of efficiency.

UNIT II

Thermodynamics: The laws of thermodynamics: The Zeroth law, various indicator diagrams, works done by and on the system, first law of thermodynamics, internal energy as a state function and other applications. Reversible and irreversible changes, Carnot cycle and its efficiency, Carnot theorem and the second law of thermodynamics, Different versions of the second law, practical cycles used in internal combustion engines. Entropy, principle of increase of entropy. The thermodynamic scale of temperature; its identity with the perfect gas scale. Impossibility of attaining the absolute zero; third law of thermodynamics.Thermodynamic relationships: Thermodynamic variables: extensive and intensive, Maxwell's general relationships, application to Joule – Thomson cooling and adiabatic cooling in a general system,

Clausius-Clapeyron Latent heat equation. Thermodynamic potentials and equilibrium of thermodnamical systems, relation with thermodynamical variables. Cooling due to adiabatic demagenetization, Production and measurement of very low temperatures.

UNIT III

Statistical Physics: The statistical basis of thermodynamics: Probability and thermodynamic probability, principle of equal a priori probabilities, probability distribution and its narrowing with increase in number of particles. The expressions for average properties. Constrains, accessible and inaccessible states, distribution of particles with a given total energy into a discrete set of energy states.Some universal laws: The μ space representation, division of μ space into energy states and into phase cells of arbitrary size, applications to one-dimensional harmonic oscillator and free particles. Equilibrium between two systems in thermal contact, bridge with macroscopic physics. Probability and entropy, Boltzmann entropy relation. Statistical interpretation of second law of thermodynamics. Boltzmann canonical distribution law and its applications; Rigorous form of equipartition of energy.

UNIT IV

Maxwellian distribution of speeds in an ideal gas: Distribution of speeds and velocities, experimental verification, distinction between mean, rms and most probable speed values. Doppler broadening of spectral lines. Black Body Radiation :Pure temperature dependence, Stefan-Boltzmann law, pressure of radiation, Spectral distribution of Black Body radiation. Wien's displacement law, Rayleigh-Jean's law, the ultraviolet catastrophe, Planck's quantum postulates, Planck's law, complete fit with experiment. Interpretation of behaviour of specific heats of gases at low temperature .

UNIT V

Quantum Statistics: Transition to quantum statistics; "h" as a natural constant and its implications, cases of particle in a one dimensional box and one-dimensional harmonic oscillator. Indistinguishability of particles and its consequences, Bose- Einstein and Fermi-Dirac conditions; applications to liquid helium, Free electrons in a metal, and photons in blackbody chamber. Fermi level and Fermi energy. Transport Phenomena : Transport phenomena is gases; Molecular collisions, mean free path and collision cross sections. Estimates of molecular diameter and mean free path. Transport of mass, momentum and energy and interrelationship, dependence on temperature and pressure.

COURSE LEARNING OUTCOMES

It will help students to understand the theories of Ideal Gas, Real Gas: Van der Waals gas.

Laws of entropy and thermodynamics, Different versions of the second law and Thermodynamic relationships. Transition to quantum statistics, Statistical Physics statistical basis of thermodynamics.

Reference Books:

1.Heat and Thermodynamics by Brijlal and Subramanayam.

2. Introduction to Statistical Mechanics by B.B. Laud

3. Statistical Mechanics by K. Haung.

4. Statistical Mechanics by R.K.Patharia.

5. Statistical Mechanics by Satyaprakash

BSCCS301 Physics-III

Practical

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			End Sem	Mid Sem	Assi gn.	End Sem	Term work			
BSCCS 301	Physics-III	2				20	30			3 hr

List of Practical:

1. Study of conversion of mechanical energy into eat

2. Heating efficiency of electrical kettle with varyhing voltages.

3. Study of temperature dependence of spectral density of radiation

4. Resistance thermometry

5. Thermo-emf thermometry

6. Conduction of heat through poor conductors of different Geometries.

7. Experimental study of probability distribution for a two-option system using a coloured dice.

8. Study of statistical distributions on nuclear disintegration data.

BSCCS302 Fundamentals of Digital Computers

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Th.	Pr.
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS 302	Fundamentals of Digital Computers	6(3-1-2)	60	20	20	20	30	150	3 hr	3 hr

OBJECTIVES:
OBJECTIVE
To explain students about basics of computer, memory devices in computer, MS DOS, windows, MS word, Excel and power point.

Unit I
Block diagram of Computer: I/P unit, O/P unit, CPU, memory unit, Generations ofComputers, types of PC's: Desktop, Laptop, Palmtop, Workstations& Super Computers.I/P and O/P devices: Keyboard, Mouse, Floppy disk, Hard disk, CD, VCD, DVD, pendrive, Joystick, Scanners, Printers, Monitors.

Algorithms: Characteristics of algorithm, Flowchart, Programming languages: Low level,Assembly Language, Middle Level Language and High Level Language, Compiler,Interpreter, Assembler, Difference b/w compiler and Interpreter.Windows: Features of Windows - Desktop, Start Menu, Control panel, My Computer,Windows Explorer, Accessories.Managing Multiple Windows, Arranging Icons on the desktop, creating a new folder onDesktop, Logging off and shutting down Windows.

Unit II
MS Word: What is Word Processing, Creating documents in MS-Word, Formattingfeatures of MS Word, Standard toolbar, drawing toolbar, tables and other features.Mail Merge, Insertion of files, pictures, clipboard, graphs, print formatting, pagenumbering and Printing documents.
MS Excel - Introduction to Worksheet and Excel.
Entering information in a worksheet - numbers, formula, etc., Saving a workbook,Editing cells, using commands and functions, moving and copying, Inserting andDeleting Rows and Columns,

Creating Charts.Print preview of Worksheet, Page setup : Margins, adding headers & footers beforeprinting, removing grid lines from printout, printing the title rows.

Unit III
Number System: Decimal, Binary, Octal, Hexadecimal, Conversions from one base toanother base. Codes : ASCII Code, EBCDIC Code, BCD Code, Grey code, Excess-3Code.Boolean algebra, De-Morgan's theorem, Binary arithmetic:- Addition, Subtraction,Multiplication & Division, unsigned binary numbers, Signed magnitude numbers, 1'scomplement & 2's complement representation of numbers , 2's complement arithmetic.

Unit IV
Boolean functions & truth tables, SOP, POS forms, minterms, simplification of logiccircuits using Boolean algebra and Karnaugh Maps.
Logic Gates:- AND, OR, NOT, NAND, NOR, X-OR and X-NOR gates their symbolsand truth tables, Construction of basic gates using universal gates , CombinationalCircuits design with gates: multiplexer, Demultiplexer, Encoder, Decoder, Half adder &Full adder, Adder/Subtractor.

Unit V
Flip flops :- RS Flip flop, D Flip flop, Edge triggered J-K Flip flop, Master-slave Flipflop.
Introduction to Registers & Counters.

COURSE LEARNING OUTCOMES

Students will be able to understand practical aspects of basics of computer, functions of operating systems, memory devices in computer, MS DOS, windows, MS word, table reparation, page set up, Excel and power point.

Text Book
1. Computer Fundamentals Architecture and Organization By B Ram

2. PC Software For Windows 98 Made Simple By R.K.Taxali

3. Computer Fundamentals Architecture and Organization ByB.Ram.

4. Digital Computer ByMalvino and Leach.

References
1. Computer Fundamentals ByP.K.Sinha

2. Microsoft Office: Rom Mansfield

3. Digital logic and Computer Design By M. Morris Mano.

4. Digital Computer & Electronics ByMalvino And Brown

BSCCS302 Fundamentals of Digital Computers

PRACTICAL

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS302	Fundamentals of Digital Computers Practical	2				20	30	50		3 hr

List of Practical

Suggested List of Practicals*(Windows, Word, Excel)*

1. Design a Scenery using Paint Brush.

2. Create Banner for your college using MS WORD.

3. Design a Greeting Card using Word Art for different festivals in MS WORD.

4. Create your Biodata and use page borders and shading using MS WORD.

5. Create a document and insert header and footer, page title etc using MS WORD.

6. Implement Mail Merge using MS WORD.

7. Use MS WORD to insert a table into a document.

8. Create a marksheet using MS Excel.

9. Creation and printing a pie bar & line graph using MS Excel.

10. Using built in function find Sum, Average , Minimum , Maximum , count for given data.

11. Design your Faculty time table using MS Excel.

BSCCS303 MATHEMATICS-III

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS303	Mathematics-III	6(5-1-0)	60	20	20	-	-	100	3 hr	3 hr

OBJECTIVES

To explain students about Calculas, Theorems on limits of sequences, absolute and conditional convergence. Differential Equations-methods and properties

To explain Laplace transformations, Homogenous linear ordinary differential equations and linear differential equations

UNIT I

Definition of a sequence. Theorems on limits of sequences. Bounded and monotonic sequences. Cauchy's convergence criterion . Series of non-negative terms. Comparison test, Cauchy's integral test, Ratio test. Raabe's test ,logarithmic test. Leibnitz's theorem. Absolute and conditional convergence.

UNIT II

Continuity of functions of one variable, sequential continuity. Properties of continuous functions. Uniform continuity. Chain rule of differentiability. Mean value theorems and their geometrical interpretations. Darboux's intermediate value theorem for derivatives. Limit and continuity of functions of two variables.

UNIT III

Series Solution of Differential Equations-Power series Method, Bessel's Equation Bessel's function and its properties, recurrence and generating relations. Legendre's.

UNIT IV

Laplace transformations, Linearity of the Laplace transformation, Existence theorem of Laplace transforms, Laplace transforms of derivatives and integrals. Shifting theorem . Differentiation and integration of transforms. Inverse Laplace transforms, Convolution theorem. Applications of Laplace transformation in solving linear differential equations with constant coefficients.

UNIT V

Homogenous linear ordinary differential equations, linear differential equations of second order. Transformation of the equation by changing the dependent variable and the independentVariable, Method of variation of parameters, Ordinary simultaneous differential equations.

COURSE LEARNING OUTCOMES

This paper will help students to understand application parts of Calculas, Theorems on limits of sequences, Absolute and conditional convergence. Differential Equations-methods and properties and Laplace transformations and linear differential equations

Recommended Text Books:

1. Calculus differential equation & Mechanics by Thakur,Shrivastava, Chandel & Rathore ;Ram Prasad Sons, Bhopal

2. Calculus differential equation & Mechanics by Dr. H.K. Pathak ; Shiksha Sahitya Prakashan, Meerut.

BSCFC304 APTITUDE-I

S. No.	Subject Code	Subject Name & Title	Maximum Marks Allotted								credit			Total Credits
			Theory				Practical				L	T	P	
			End Sem	Mid Sem. MST	Quiz, Assignment	Total Marks	Lab Work	Assignment /Quiz/Term paper	End Sem	Total Marks				
1	BSCFC304	Aptitude - I	60	20	20	100					3	1		4

Objective: The aim of this course is to ensure that students are synthesizing the material, understanding key concepts, and making abstract connections through testing of a comprehensive nature.

Unit-1: **General Intelligence & Reasoning:** Analogy, Blood Relation, Classification, Coding-Decoding, Direction and Distance, Matrix, Non-verbal reasoning, puzzles, series.

Unit-2: General Awareness: Current affairs, Govt. Project & Scheme, Basic science and symbols, sports awareness, economics, new innovations, people in news.

Unit-3 : English Comprehension: Error spotting, one word substitution, phrases and idioms, reading comphrension, sentence correction, spelling correction.

Unit-4 : Quantitative Aptitute-I: Algebra, averages, data interpretation, interest, menusration, number systems, percentage.

Unit-5: Quantitative Aptitute-II: Ratio and proportion, problem on age, simplification, speed, distance and time, trigonometry.

Learning Outcome: Students will be able to apply quantitative reasoning and mathematical analysis methodologies to understand and solve problems.

Reference Books :

1. Quantitative Aptitude for Competitive Examination by Pearson edition.

2. Qunatitative Aptitude and Reasoning by R.V. Parveen.

3. Quantitative Aptitude by R. S. Agrawal

4. A Comprehensive grammar of english by G. N. Verma

5. For New and Knowledge – The Hindu, Times of India and Economics Times.

BSCFC 305 COMPUTER APPLICATIONS

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted									credit			Total Credits
			Theory				Practical								
			End Sem	Mid Sem. MST	Quiz, Assignment	Total Marks	Lab Work	Assignment /Quiz/Term paper	End Sem	Total Marks	L	T	P		
1	BSCFC305	Computer Applications	60	20	20	100					3	1		4

OBJECTIVE

To explain students about basics of computer, memory devices in computer, MS DOS, windows, MS word, Excel and power point.

UNIT-I:

Basics of Computers **:**Definition of a Computer - Characteristics and Applications of Computers Block Diagram of a Digital Computer – Classification of Computers based on size and working Central Processing **UNIT** – I/O Devices.

UNIT II

Primary, Auxiliary and Cache Memory – Memory Devices. Software, Hardware, Firmware and People ware – Definition and Types of Operating System – Functions of an Operating System – MS-DOS – MS Windows – Desktop, Computer, Documents, Pictures, Music, Videos, Recycle Bin, Task Bar – Control Pane.

UNIT III

Features of MS-Word – MS-Word Window Components – Creating, Editing, Formatting and Printing of Documents – Headers and Footers – Insert/Draw Tables, Table Auto format – Page Borders and Shading – Inserting Symbols, Shapes, Word Art, Page Numbers, Equations – Spelling and Grammar – Thesaurus – Mail Merge

UNIT IV:

Features of PowerPoint – Creating a Blank Presentation - Creating a Presentation using a Template - Inserting and Deleting Slides in a Presentation – Adding Clip Art/Pictures -

Inserting Other Objects, Audio, Video - Resizing and Scaling of an Object – Slide Transition – Custom Animation

UNIY-V

MS-Excel: Overview of Excel features – Creating a new worksheet, Selecting cells, Entering and editing Text, Numbers, Formulae, Referencing cells – Inserting Rows/Columns – Changing column widths and row heights, auto format, changing font sizes, colors, shading.

COURSE LEARNING OUTCOMES

Students will be able to understand practical aspects of basics of computer, functions of operating systems, memory devices in computer, MS DOS, windows, MS word, table preparation, page set up, Excel and power point.

Reference Books:

1. Fundamentals of Computers by ReemaThareja, Publishers : Oxford University Press, India
2. Fundamentals of Computers by V.Raja Raman, Publishers : PHI
3. Microsoft Office 2010 Bible by John Walkenbach, Herb Tyson, Michael R.Groh and FaitheWempen, Publishers : Wiley

IV SEMESTER
BSCCS401 Physics-IV

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS401	Physics-IV	6(3-1-2)	60	20	20	20	30	150	3 hr	3 hr

OBJECTIVE
To explain about characteristics of waves, Group velocity, Noise and Music, different theories of Geometrical Optics, Aberration in images, Interference of light; The principle of superposition, Fresnel Diffraction.

UNIT I
Waves: Waves in Media; Speed of transverse waves on a uniform string, speed of longitudinal waves in a fluid, energy density and energy transmission in waves, typical measurements. Waves over liquid surface; gravity waves and ripples. Group velocity and phase velocity, their measurements. Superposition of waves, Linear homogeneous equations and the superposition principle, idea of nonlinear waves, non-validity of superposition principle and consequences. Standing waves, Standing waves as normal modes of bounded systems, examples, harmonics and the quality of sound, examples. Chladni's figures and vibrations of a drum. Production and detection of ultrasonic and infrasonic waves and applications.

UNIT-II
Acoustics: Noise and Music , The human ear and its responses , limits of human audibility, intensity and loudness, bel and decibel, the musical scales, temperament and musical instrument. Reflection, refraction and diffraction of sound; Acoustic impedance of a medium, percentage reflection and refraction at a boundary, impedance matching for transducers, diffraction of sound, principle of a sonar system, sound ranging. Applied acoustics : Transducers and their characteristics. Recording and reproduction of sound, various systems, measurements of frequency, waveform, intensity and velocity. The acoustics of halls, reverberation period, Sabine's formula.

UNIT-III
Geometrical Optics: Fermat's Principle of extremum path, the aplanatic points of a sphere and other applications. General theory of image formation: cardinal points of an optical system, general relationships for thick lens and lens combinations, Lagrange equation of magnification, telescopic combinations, telephoto lenses and eyepieces. Aberration in images: Chromatic aberrations, achromatic combination of lenses in contact and separated lenses. Monochromatic

aberrations and their reductions; aspherical mirrors and Schmidt corrector plates, aplanatic points, oil immersion objectives, meniscus lens. Optical instruments: Entrance and exit pupils, need for a multiple lens eyepiece, common types of eyepieces.

UNIT-IV
Interference: Interference of light; The principle of superposition, twoslit interference, coherence requirement for the sources, optical path retardations, lateral shift of fringes, Rayleigh refractometer and other applications. Localised fringes; thin films, interference by a film with two non-parallel reflecting surfaces, Newton's rings. Haidinger fringes (Fringes of equal inclination). Michelson interferometer, its application for precision determination of wavelength, wavelength difference and the width of spectral lines. Intensity distribution in multiple beam interference, Fabry-Perot interferometer and etalon.

UNIT-V
Fresnel Diffraction : Fresnel half period zones, plates, straight edge, rectilinear propogation. Fraunhoffer Diffraction: Diffraction at a slit, phasor diagram and integral calculus methods, the intensity distribution, diffraction at a circular aperture and a circular disc, resolution of images, Rayleigh criterion, resolving power of telescope and microscope. Outline of phase contrast microscopy. Diffraction & Polarization : Diffraction gratings: Diffraction at N parallel slits, intensity distribution, plane diffraction grating, reflection grating and blazed gratings. Concave grating and different mountings. Resolving power of a grating and comparison with resolving powers of prism and of a Fabry-Perot etalon. Double refraction and optical rotation: Refraction in uniaxial crystals, its electromagnetic theory. Phase retardation plates, double image prism. Rotation of plane of polarization, origin of optical rotation in liquids and in crystals

COURSE LEARNING OUTCOMES
It will help students to understand about To explain about charecterstics of waves, Group velocity, Noise and Music, different theories of Geometrical Optics, Aberration in images, Interference of light; The principle of superposition, Fresnel Diffraction.

TEXT/ REFERENCE BOOKS
1. Waves and Oscillations by S. P. Puri.
2. Waves and Oscillations by Brijlal and Subramanayam.
3. Vibration and Waves by I.G.Main
4. The Physics of Vibration and Waves by H.J.Tain (MacMillan 1975)
5. Optics by A.K.Ghatak

BSCCS401 Physics-IV

Practical

Subject Code	Subject Name	Credits	Maximum marks Allotted					Total	Duration of Exam.	
			Theory			Practical			Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS401	Physics-IV	2	-	-	-	20	30	50		3 hr

Practicals:

1. Study of interference using biprism.

2. Study of diffraction at straight edge.

3. Use of diffraction grating and it's resolving limit.

4. Resolving power of telescope.

5. Polarization by reflection.

6. Study of optical rotation.

7. Refractive index and dispersive power of prism using spectrometer.

8. Speed of waves on a stretched string

9. Measurement of sound intensities with different situation

10. Characteristics of a microphone & loudspeaker system.

BSCCS402 DBMS

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS402	DBMS	6(4-0-2)	60	20	20			100	3 hr	

OBJECTIVE

The objective of this course is to help the students to get knowledge about databases its architecture various models.

Unit – I

DBMS Definition, Characteristics of DBMS ,Application and advantages of DBMS, Instances , Schemas and Database States, Three Levels of Architecture , Data Independence, DBMS languages, Data Dictionary, Database Users, Data Administrators.

Unit – II

Data Models, types and their comparison, Entity Relationship Model, Entity Types, Entity Sets, Attributes and its types, Keys, E-R Diagram, Data Integrity RDBMS – Concept, Components and Codd's rules.

Unit – III

Relational Algebra (selection, projection, union, intersection, Cartesian product, Different types of join like theta join, equi-join, natural join, outer join)

Functional Dependencies, Good & Bad Decomposition, Anomalies as a database: A consequences of bad design, Normalization: 1NF, 2NF, 3NF, BCNF, 4NF 5NF.

Unit – IV

Introduction to SQL, DDL, DML, and DCL statements, Creating Tables, Adding Constraints, Altering Tables, Update, Insert, Delete & various Form of SELECT- Simple,

Using Special Operators for Data Access. Aggregate functions, Joining Multiple Tables (Equi Joins),Joining a Table to itself (self Joins) Functions.

Unit – V

Introduction to PL/SQL (blocks of PL/SQL, Variables, constants), Control Structure Introduction to Stored Procedures, Functions , Cursor and Triggers

COURSE LEARNING OUTCOMES

Students will be able to develop databases with all the constraints which help in storing and retrieving data easily.

References books
1. Unified Chemistry M. N. Tondan B.Sc. IV SEM
2. Unified Practical Chemistry M. N. Tondan B.Sc. II Year
3. Yugbodh Publication Unified Chemistry B.Sc. IV SEM
4. Yugbodh Publication Unified Practical Chemistry B.Sc. II Year
5. Organic Chemistry Sharma & Sharma

BSCCS402 DBMS- PRACTICAL

Subject Code	Subject Name	Credits	Maximum marks Allotted					Total	Duration of Exam.	
			Theory			Practical			Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS402	DBMS	2	-	-	-	20	30	50		3 hr

List of Practical

1. Introduction to DBMS.

2. To create a table, alter and drop table.

3. To perform select, update, insert and delete operation in a table.

4. To make use of different clauses viz where, group by, having, order by, union, intersection, set difference.

5. To study different constraints.

6. [SQL FUNCTION]

7. To use oracle function viz aggregate, numeric, conversion, string function.

8. To understand use and working with joins.

9. To understand use and working of sub-queries.

10. To make use of transaction control statement viz rollback, commit and save point.

11. To make views of a table.

12. To make indexes of a table.

13. To inbuilt SQL function to create database.

14. [PL/SQL]

15. Introduction to SQL & PL/SQL

BSCCS403 Mathematics-IV

Subject Code	Subject Name	Credits	Maximum marks Allotted					Total	Duration of Exam.	
			Theory			Practical			Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS403	Mathematics-IV	6(5-1-0)	60	20	20	-	-	100	3 hr	-

OBJECTIVE

To explain about Partial differentiation, Maxima, minima and saddle points of functions of two variables, Partial Differential equations of the first order, Complex numbers as ordered pairs, Group-Automorphisms and inner automorphism

UNIT I

Partial differentiation. Change of variables. Euler's Theorem on homogeneous function, Taylor's theorem for functions of two variables. Jacobians, Envelopes, Evolutes.

UNIT II

Maxima, minima and saddle points of functions of two variables. Beta and Gamma functions. Double and triple integrals. Dirichlet's integrals.

UNIY III

Partial Differential equations of the first order. Lagrange's solution. Some special types of equations which can be solved easily by methods other than general methods. Charpit's general method of solution, Partial differential equations of second and higher orders. Homogeneous and non- Homogeneous equations with constant coefficients. Partial differential equations reducible to equations with constant coefficients.

UNIT IV

Complex numbers as ordered pairs. Geometric representation of Complex numbers, Continuity and differentiability of Complex functions. Analytical function, Cauchy Riemann equation, Harmonic function, Mobius transformations, fixed point, cross ratio.

UNIT V

Group-Automorphisms, inner automorphism. Group of Automorphism, Conjugacy relation and centraliser. Normaliser. Counting principle and the class equation of a finite group. Cauchy's theorem for finite abelian groups and non abelian groups. Ring homomorphism. Ideals and Quotient Rings

COURSE LEARNING OUTCOMES

Students will be able to understand Partial differentiation, Maxima, minima and saddle points of functions of two variables, Partial Differential equations of the first order, Complex numbers as ordered pairs, Group-Automorphisms, inner automorphism and Group of Automorphism

REFERENCE BOOKS:

1. Advanced Calculus, Partial Differential Equations, Complex Analysis And Abstract Algebra By Thakur,Shrivastava, Chandel & Rathore ;Ram Prasad Sons, Bhopal
2. Advanced Calculus, Partial Differential Equations, Complex Analysis And Abstract Algebra By Dr. H.K. Pathak ; Shiksha Sahitya Prakashan, Meerut.

BSCFC 404 Internet Fundamentals and Web Tools

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted								credits			Total Credits
			Theory				Practical							
			End Sem	Mid Sem. MST	Quiz, Assignment	Total Marks	Lab Work	Assignment /Quiz/Term paper	End Sem	Total Marks	L	T	P	
1	BSCFC404	Internet Fundamentals And Web Tools	60	20	20	100					3	1		4

OBJECTIVE

To explain about fundamental of internet, Web Site Address, Searching the Internet, basics of Emails, Web Applications, Web Terminologies and Basic HTML.

UNIT-I: Fundamentals of Internet : Networking Concepts, Data Communication – Types of Networking, Internet and its Services, Internet Addressing – Internet Applications – Computer Viruses and its types – Browser –Types of Browsers.

UNIT-II: Internet applications: Using Internet Explorer, Standard Internet Explorer Buttons, Entering a Web Site Address, Searching the Internet – Introduction to Social Networking: twitter, tumblr, Linkedin, facebook, flickr, skype, yelp, vimeo, yahoo!, google+, youtube, WhatsApp, etc.

UNIT-III : E-mail   : Definition of E-mail - Advantages and Disadvantages – UserIds, Passwords, Email Addresses, Domain Names, Mailers, Message Components, Message Composition, Mail Management,Email Inner Workings.

UNIT IV: WWW- Web Applications, Web Terminologies, Web Browsers,URL– Components of URL, Searching WWW – Search Engines and Examples

UNIT-V: Basic HTML: Basic HTML – Web Terminology – Structure of a HTML Document – HTML, Head and Body tags – Semantic and Syntactic Tags – HR, Heading, Font, Image and Anchor Tags –Different types of Lists using tags – Table Tags, Image formats – Creation of simple HTML Documents.

COURSE LEARNING OUTCOME

Students will be able to understand prac tical aspects of internet, Web Site Address, Searching the Internet, basics of Emails, Web Applications, Web Terminologies and Basic HTML.

Reference Books:
1. In-line/On-line : Fundamentals of the Internet and the World Wide Web, 2/e – by Raymond Greenlaw and Ellen Hepp, Publishers : TMH

BSCFC 405 Aptitude - II

S. No.	Subject Code	Subject Name & Title	Maximum Marks Allotted								credit			Total Credits
			Theory				Practical							
			End Sem	Mid Sem. MST	Quiz, Assignment	Total Marks	Lab Work	Assignment /Quiz/Term paper	End Sem	Total Marks	L	T	P	
1	BSCFC405	Aptitude II	60	20	20	100					3	1	-	4

Objective: The aim of this course is to introduce to student the basic concepts related of Aptitude which can form foundation to understanding advanced concepts in managing an organization.

Unit-1 General Intelligence & Reasoning: Word formation, Arranging words in Logical order or Dictionary order, Venn diagram, Missing Number, Forecasting, Blood Relation, verbal reasoning.

Unit-2 General Awareness: Static general knowledge, Biology, Chemistry, Physics + Space Science, Computer & Mobile Technology, Diseases, Pollution & Nutrition, people in news, Govt. Project & Scheme News reading.

Unit-3 English comprehension: Spelling, Fill in the blank, Word replacement, Error spotting, one word substitution, phrases and idioms, reading comprehension, sentence correction.

Unit-4 Quantitative Aptitude-I: Classification, data interpretation, compound interest, menusration, number systems, percentage, probability Problem in age.

Unit-5 Quantitative Aptitude-II: Simplification, speed, distance and time, trigonometry, mixture problem, geometry- Squares, cuboid, Problem in triangle.

Learning Outcome: Students will be able to apply quantitative aptitude, logical reasoning, English comprehension and trigonometrya understand and solve the problems.

Reference Books:

1. Quantitative Aptitude for Competitive Examination by Pearson edition.

2. Quantitative Aptitude and Reasoning by R.V. Parveen.

3. Quantitative Aptitude by R. S. Agrawal

4. A Comprehensive grammar of english by G. N. Verma

5. For New and Knowledge – The Hindu, Times of India and Economics Times.

SEMESTER- V

BSCCS 501 PHYSICS-V

Subject Code	Subject Name	Credits	Maximum marks Allotted					Total	Duration of Exam.	
			Theory			Practical			Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS 501	**PHYSICS-V**	6(4-0-2)	60	20	20	30	20	150	3 hr	3 hr

Pattern:

The question paper will consist of 8 questions. Out of Which Candidate have to attempt any 5 questions . Each question will Carry two parts 'A'(6 marks) and ' B'(6 marks) both are compulsory .One question will have 12 marks

Syllabus

Theory:

Unit-1 Theory of Relativity:

Reference systems, inertial frames, Galilian Invariance and conservation laws, propagation of light, Michelson-Morley experiment; search for ether. Postulates for the special theory of relativity, Lorentz transformations, length contraction, time dilation, velocity addition theorem, variation of mass with velocity, mass - energy equivalence, particle with zero rest mass. Origin of Quantum Theory: Failure of classical physics to explain the phenomena such as a black-body spectrum, photoelectric effect , Ritz combination principle in spectra. stability of an atom,Planck's radiation law, Einstein's explanation of photoelectric effect. Bohr's quantization of angular momentum and its application to hydrogen atom, limitations of Bohr's theory.

Unit-2 Quantum Mechanics: Wave-particle duality and uncertainty principle; de Broglie's hypothesis for matter waves; the concept of wave and group velocities, evidence for diffraction and interference of particles, experimental demonstrations of matter waves. Consequence of de Brogile's concepts; quantization in hydrogen atom; energies of a particle in a box, wave packets, Heisenberg's uncertainty relation for p and x, its extension to energy and time. Consequence of the uncertainty relation; gamma ray microscope, diffraction at a slit, particle in a box, position of an electron in a Bohr's orbit, Schrödinger's equation. Postulates of quantum mechanics; operators, expectation values, transition probabilities, applications to a particle in one and three dimensional boxes, harmonic oscillator, reflection at a step potential, transmission across a potential barrier.

Unit-3 Atomic Physics: Solution of Schrodinger equation for Hydrogen atom; natural occurrence of quantum numbers-n, l and m, the related physical quantities. Spectra of hydrogen, deuteron and alkali atoms spectral terms, doublet fine structure. screening constants for alkali spectra for s,p,d and f states, selection rules, Singlet and triplet fine structure in alkaline earth spectra. L-S and J-J couplings.

Weak Spectra: Continuous X-ray spectrum and its dependence on voltage, Duane and Hundt's law. Characteristic X-rays. Moseley's law; doublet structure of X-ray spectra. X-ray absorption spectra.

Unit-4 Molecular Spectra : Discrete set of electronic energies of molecules, quantization of vibrational and rotational energies, determination of internuclear distance, pure rotational and rotation-vibration spectra Dissociation limit for the ground and other electronic states, transition rules for pure vibration and electronic vibration spectra. Spectroscopy : Raman Effect, Stokes and anti-stokes lines, complimentary character of Raman and infrared spectra, experimental arrangements for Raman Spectroscopy. Spectroscopic techniques: Sources of excitation, prism and grating spectrographs for visible, UV and IR, absorption spectroscopy, double beam instruments, different recording systems.

Unit-5 Nuclear Physics: Interaction of charged particles and neutrons with matter, working of nuclear detectors, G-M counter, proportional counter,scintillation counter, cloud chamber, spark chamberand emulsions technique. Structure of nuclei, basic properties (I, μ, Q and binding energy), deuterium binding energy, p-p and n-p scattering and general concepts of nuclear forces. Beta decay, range of alpha particle, Geiger-Nuttal law. Gamow's explanation of alpha decay, beta decay, continuous and discrete spectra. Nuclear reactions, channels, compound nucleus, direct reaction (concepts).Shell model, Liquid drop model, Nuclear fission and fusion (concepts), energy production in stars by p-p and carbon - nitrogen cycles (concepts).

Practicals:

1. Determination of Planck's constant.

2. Determination of e/m using Thomson's method.

3. Determination of e by Millikan's method.

4. Study of spectra of hydrogen and deuterium (Rydberg constant and ratio of masses electron to proton.

5. Absorption spectrum of iodine vapour.

6. Study of alkali or alkaline earth spectra using concave grating.

7. Study of Zeeman effect for determination of Lande g-factor.

8. Study of Raman spectrum using laser as an excitation source.

9. Determination of percentage of absorption of light by photometer

Reference Books:

1. Quantum Physics of Atoms, Molecules, Solids, Nuclear and Particles by Eisenberg and Resnik, John Wiley and sons.

2. Quantum Mechanics by Satya Prakash

3. Atomic Physics by J.B.Raja

4. Modern Physics by R. Murugeshan, K. Shiva Erasath

5. Introduction to Atomic Physics by H.E. White

COURSE : BSC CS

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS502	DATA COMMUNICATION AND NETWORK	6(5-1-0)	70	20	10	-	-	100	3 hr	-

UNIT :- I

Introduction to data communication: Components , data representation ,data flow and basic model ,data representation ,Serial & Parallel transmission , Modes of data transmission, Encoding:Unipolar,Polar ,Bipolar line & block codes ,Data compression ,Frequency dependant codes, Run length encoding ,Relative encoding ,LZ Compression ,Image and multimedia compression. Review of analog & digital transmission methods, Nyquist Theorem .

UNIT:-2

Multiplexing: FDM, TDM, WDM, Synchronous & Statistical TDM, North American digital multiplexing hierarchy, European TDM, Spread spectrum: Frequency Hopping & Direct Sequence spread spectrum. Terminal handling & polling. Switched Communication Networks: Circuit, Message, Packet & Hybrid Switching, Softswitch Architecture with their comparative study, X.25, ISDN.

UNIT:-3

Physical Layer: Introduction, Interface, Standards, EIA-232-D, RJ-45, RJ-11, BNC connector & EIA-449 digital Interface: Connection, specifications & configuration, X.21 Modem: Types, features, signal constellation, block schematic, limited distance, dial up, baseband,line driver, Group Band and Null modems etc., ITU-T V-series modem standards Connecting Devices: Active and Passive Hubs, Repeaters, Bridges, Two & Three layer switches & Gateway. Study of various types of topology and their comparative study and introduction to queing theory.

UNIT:-4

Transmission Media: Transmission line characterestics, distortions, Crosstalk, Guided Media: Twisted Pair, Baseband & Broadband Coaxial.Optical Fibre : Physics and velocity of propagation of light ,

Advantages & Disadvantages ,Block diagram ,Nodes and classification ,Comparision,losses , light source and detectors , Construction, Unguided media : Electromagnetic polarization ,Rays and wavesfront ,electromagnetic spectrum and radiation ,spherical wavefront and inverse square law , wave attenuation and absorption, optical properties of Radio waves , Terestrial Propagation of electromagnetic waves , skip distance , free – space path loss ,Radio waves , Microwave , Infrared & Satellite Communication system . Telephone Network: Components, LATAs, signaling and Services, Digital Subscriber Line: ADSL,

HDSL, SDSL, VDSL, Cable TV network for data transfer.

UNIT:-5

Transmission Errors : Content Error , flow integrity error , methods of error control ,Error detection ,Error correction ,Bit error rate , Error detection methods: Parity checking , Checksum Error Detection ,Cyclic Redudancy Check ,Hamming code , Interleaved codes , Block Parity , Convolution code, Hardware Implementation, Checksum .

Suggested Reading:

1. Gupta Prakash C.,"Data communication", PHI Learning
2. Tomasi,"Introduction to Data Communication & Networking, Pearson Education
3. Forouzan, "Data communication", TATA McGraw
4. Godbole,"Data Communication & Network" , TMH
5. Miller,"Data Network and Comunication",Cengage Delmar Learning
6. William Stallings ,"Data & Computer Communication", Pearson Education
7. A.S Tanenbum,"Computer Network",Pearson Education.

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS503	Mathematics V	6(5-1-0)	70	20	10	-	-	100	3 hr	-

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions and carry 10 marks. Remaining five questions carry 12 marks each, one from each of the five units of the syllabus and will have internal choice. These five questions will have two parts A & B, Candidates are required to answer all questions.

Syllabus

Unit -1: Riemann integral, Integrability of continuous and monotonic functions, The fundamental theorem of integral calculus, Mean value theorems of integral calculus, Partial derivatives and differentiability of real-valued functions of two variables.

Unit -2: Schwarz and Young's theorem, Implicit function theorem, Fourier series of half and full intervals, Improper integrals and their convergence, Comparison test, Abel's and Dirichlet's tests, Frullani's integral, Integral as a function of a parameter.

Unit -3: Definition and examples of vector spaces, subspaces, Sum and direct sum of subspaces. Linear span, Linear dependence, independence and their basic properties. Basis, Finite dimensional vector spaces, Existence theorem for basis, Invariance of the number of elements of a basis set, Dimension, Dimension of sums of vector subspaces.

Unit -4 Linear transformations and their representation as matrices, The Algebra of linear transformations, The rank- nullity theorem, Eigen values and eigen vectors of a linear transformation, Diagonalisation. Quotient space and its dimension.

Unit -5: Binary Relations, Equivalence Relations, Partitions and Partial Order Relation . Graphs, Multigraphs, Weighted Graphs, Paths and Circuits, Shortest Paths. Trees and their properties.

Reference Books:

1. REAL ANALYSIS, LINEAR ALGEBRA AND DISCRETE MATHEMATICS BY THAKUR,SHRIVASTAVA, CHANDEL & RATHORE ;RAM PRASAD SONS, BHOPAL

2. Real analysis , Linear algebra and Discrete Mathematics by Dr. H.K. Pathak ; Shiksha Sahitya Prakashan, Meer

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS504	HINDI (BHASHA KAUSHAL EVAM SANCHAR SADHAN)	6(5-1-0)	70	20	10	-	-	100	3 hr	-

इकाई - 1

1. भारतीय संस्कृति

2. भारतीय समाज व्यवस्था

3. सभ्यता एव संस्कार

4. वैश्विक चेतना

5. समन्वयीकरण (भारतीय एव अंतर्राष्ट्रीय सदंर्भ में)

इकाई - 2

1. धर्म

2. न्याय

3. दर्शन

4. नीति

5. साहित्य

इकाई - 3

1. संचार संसाधन : सम्पर्कके नए क्षितिज

2. समाचार पत्र

3. भारतीय प्रेस परिषद्

4. रेडियो

5. दूरदर्शन

इकाई - 4

1. सिनेमा

2. रंगमंच

3. सर्गीत

4. चित्र, मूर्ति, स्थापत्य कला

5. शिल्प कला

इकाई - 5

1. कम्प्यूटर

2. दूरभाष: विज्ञान की सौगात

3. मत्रं (कहानी): प्रेमे चदं

4. मातृभूमि (कविता): मैथिलीशरण गुप्त

6. साहित्यकार का दायित्व: डॉ. प्रेम भारती

संदर्भ पुस्तक – मध्यप्रदेश हिन्दी ग्रंथ अकादमी भोपाल द्वारा प्रकाशित पुस्तक

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS 505	Visual Basic	2	35	10	5	-	-	50	3 hr	3 hr

UNIT 1: Introduction to VB.NET: Event Driven Programming, NET as better Programming Platform, NET Framework, NET Architecture, The Just-In-Time Compiler, NET Framework class library

UNIT 2: VB.NET Development Environment: Creating Applications, Building Projects, Using simple components, Running VB.NET applications

UNIT 3: Mastering VB Language: Data, Operators, Conditionals and Loops, Procedures, Error Handling, Classes and Objects.

UNIT 4: Windows Applications in VB .NET: Windows Forms, Text Boxes, Buttons, Labels, Check Boxes, and Radio Buttons, List Boxes, Combo Boxes, Picture Boxes, Scrollbars, Splitters, Timer Menus, Built-in Dialogs, Image List, Tree Views, List Views, Toolbars, Status Bar and Progress bars.

UNIT 5: Object Oriented Programming in VB .NET: Class and Object, Properties, methods, Constructors and Destructors, Method overloading, Inheritance, Access modifiers Overloading and Overriding, Interfaces, Polymorphism.

Suggested Reading:

Starting Out with Visual Basic 2012, 6th Edition. Gaddis. Addison-Wesley. ISBN: **978-0133128086**.

Department of Science

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			End Sem	Mid Sem	Assi gn.	End Sem	Term work			
BSCCS601	**Physics-VI**	6(4-0-2)	70	20	10	30	20	150	3 hr	3 hr

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions and carry 10 marks. Remaining five questions carry 12 marks each, one from each of the five units of the syllabus and will have internal choice. These five questions will have two parts A & B, Candidates are required to answer all questions.

Syllabus

Theory:

Unit-1 Overview: Crystalline and glassy forms, liquid crystals, glass transition. Crystal structure: Periodicity, lattices and bases, fundamental translation vectors, unit cell, Wigner-Seitz cell, allowed rotations, lattice types, lattice planes. Common crystal structures. Laue's theory of X-ray diffraction, Bragg's law, Laue patterns. Bonding: Potential between a pair of atoms; Lennard-Jones potential, concept of cohesive energy, covalent, Vander Waal, ionic and metallic crystals Magnetism: Atomic magnetic moment, magnetic susceptibility, Dia, Para and Ferromagnetism, Ferro magnetic domains. Hysteresis.

Unit-2 Thermal properties: Lattice vibrations, simple harmonic oscillator, second order expansion of Lennard-Jones potential about the minimum, vibrations of one dimensional monoatomic chain under harmonic and nearest neighbour interaction approximation. Concept of phonons, density of modes (1-D). Debye model; Lattice specific heat low temperature limit, extension (conceptual) to 3-D. Band Structure: Electrons in periodic potential; nearly free electron model (qualitative), energy band, energy gap, metals, insulators, semiconductors. Motion of electrons: Free electrons, conduction electrons, electron collisions, mean free path, conductivity and Ohm's law. Density of states. Fermi energy, Fermi velocity, Fermi-Dirac distribution.

Unit-3 Semiconductors: Semiconductors ; Intrinsic-semiconductors, electrons and holes, Fermi Level , Temperature dependence of electron and hole concentrations. Doping: impurity states, n and p type semiconductors, conductivity, mobility, Hall Effect, Hall Coefficient. Semiconductor devices: Metal-

semiconductor junction, p-n junction, majority and minority carriers, diode, Zener and tunnel diodes, light emitting diode, transistor, solarcell. Power supply: Diode as a circuit element, load line concept, rectification, ripple factor, Zener diode, voltage stabilization, IC voltage regulation. Transistors : Characteristics of a transistor in CB, CE and CC mode, graphical analysis of the CE configuration, low frequency equivalent circuits, h-parameters, bias stability, thermal runaway.

FETs: Field effect transistors, JFET volt-ampere curves, biasing JFET, ac operation of JFET, source follower. MOSFET, biasing MOSFET, FET as variable voltage resister.

Unit-4 Amplifiers- I: Small signal amplifiers ; General Principle of operation, classification, distortion, RC coupled amplifier, gain frequency response , input and output impedance, multistage amplifiers. Amplifier- II: Transformer coupled amplifiers, Equivalent circuits at low, medium and high frequencies, emitter follower, low frequency common source and common drain amplifier, Noise in electronic circuits. Oscillators: Feedback in amplifiers, principle, its effects on amplifiers, characteristics. Principle of feedback amplifier, Barkhausen criteria, Hartley, Colpitt and Wein bridge oscillators.

Unit-5 Laser: Laser system: Purity of a spectral line, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients. Spontaneous and induced emissions, conditions for laser action, population inversion. Types of Lasers (gas and solid state), Pulsed lasers and tunable lasers, spatial coherence and directionality, estimates of beam intensity, temporal coherence and spectral energy density.

Practicals:

1. Characteristic of a transistor.

2. Characteristic of a tunnel diode.

3. Hysteresis curve a transformer core.

4. Hall probe method for measurement of resistivity.

5. Specific resistance and energy gap of a semiconductor.

6. Study of voltage regulation system.

7. Study of regulated power supply.

8. Study of Lissajos figures using a CRO.

9. Study of VTVM.

10. Study of RC coupled amplifiers

11. Analysis of a given band spectrum.

12. Study of crystal faces.

13. Study of laser as a monochromatic coherence source

Reference Books:

1. Introduction to Solid State Physics C. Kittel

2. Micro Electronics J- Millman and A. Grabel

3. Electronic Devices and Circuits : Millman Halkias

4. Laser and Nonlinear Optics by B.B. Laud

5. Laser by Svelte

(Board of studies)   **(Academic Council)**   **(Registrar)**

Seal

Subject Code	Subject Name	Credits	Maximum marks Allotted					Total	Duration of Exam.	
			Theory			Practical			Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS602	Web Developement	6(4+2)	60	20	20	-	-	100	3 hr	3 hr

Unit-I

Introduction to PHP, History of PHP, Versions of PHP, Features of PHP, Advantages of PHP over

Other Scripting Languages, Installation and

Configuration of PHP, Data Types in PHP, PHP Syntax, Comments, PHP

Variables and Constants, Scope of Variables, PHP String, String Manipulation, PHP Operators, Precedence

of Operators, Expressions, Creating a PHP Script, Running a PHP Script.

Unit-II

Basic HTML, Embedding PHP in HTML, Passing Information between Pages, PHP $_GET, 			PHP

$_POST, PHP Conditional Statements, PHP Looping

Statements, Break, Continue, Exit, PHP Functions: Built-in and User Defined

Function, Regular Expression Functions, Mathematical, Date and Time Functions, PHP Arrays: Creating Array and Accessing Array Elements,

Unit-III

PHP File Permissions, Working with Files: Opening, Closing, Reading, Writing a

File; Working with Directory: Creating, Deleting, Changing a Directory; Working with Forms: Introduction to a Web Form, Processing a Web Form, Validating a Web Form, Input Validation,

PHP with Client Side Scripting Language, Exception and Error Handling in PHP, Introduction to Cookies and Session Handling,

Unit-IV

Working with Database: PHP-Supported Databases; Using PHP & My SQL:

Installation and Configuration of My SQL on Windows, Checking Configuration, Connecting to Database, Selecting a Database, Adding Table and Altering Table in a Database, Inserting, Deleting and Modifying Data in a Table, Retrieving Data, Performing Queries, Processing Result Sets,

Unit-V

Code Re-use, require(), include(), and the include_path, File System Functions

and File Input and Output, File Uploads, Use of CSS, Introduction to Object Oriented Programming with PHP, Installing and Configuring Apache to use PHP on Windows, php.ini File,

TEXT & REFERENCE BOOKS:

- PHP & MY SQL, BY VIKRAM VASWANI, TMH PUBLICATIONS

- PHP ESSENTIALS, BY JULIE C. MELONI, BPB PUBLICATIONS

- PHP 5 AND MY SQL BIBLE, BY TIM CONVERSE AND JOYCE PARK, WILEY-DREAMTECH INDIA PUBLICATIONS

- WEB TECHNOLOGIES, BLACK BOOK, DREAMTECH PRESS

- ATKINSON, LEON. CORE PHP PROGRAMMING,NEW YORK: PRENTICE HALL

- LEARNING PHP 5, BY DAVID SKLAR PUBLISHER O'REILLY MEDIA

- MASTERING PHP, BY CHARLES, PUBLISHER: BPB

- EXPERT PHP AND MYSQL, WROX PROGRAMMER TO PROGRAMMER, WROX PRESS, 2010

- PHP FOR ABSOLUTE BEGINNERS, APRESS, 2009

- SAMS TEACH YOURSELF CSS IN 24 HOURS (2ND EDITION), SAMS PUBLISHING, 2006

- HTTP://WWW.PHPBUILDER.COMHTTP://PHP.FAQTS.COM

Department of Science B.Sc. VI Sem.

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS603	Mathematics -VI	6(5-1-0)	70	20	10	-	-	100	3 hr	-

Pattern: The question paper will consist of six questions. Question no. 1 will have 10 objective type questions and carry 10 marks. Remaining five questions carry 12 marks each, one from each of the five units of the syllabus and will have internal choice. These five questions will have two parts A & B, Candidates are required to answer all questions.

Syllabus

Unit -1: Definition and examples of metric spaces. Neighbourhoods. Limit points. Interior points. Open and closed and interior. Boundary points. Subspace of a metric space. Cauchy sequences. Completeness, Cantor's intersection theorem, Contraction principle. Real numbers as a complete ordered field. Dense subsets. Baire Category sets. Closure theorem. Separable, first and second countable spaces.

Unit -2: Continuous functions. Extension theorem. Uniform continuity. Compactness, Sequential compactness. Totally bounded spaces, Finite intersection property. Continuous functions and compact sets. Connectedness

Unit -3: Solution of Equations: Bisection. Secant, Regula Falsi. Newton, Method. Roots of second degree Polynomials, Interpolation, Lagrange interpolation, Divided Differences, Interpolation formulae using Differences, Numerical Quadrature, Newton-Cote's Formulae, Gauss Quadrature Formulae.

Unit -4: Linear Equations: Direct Methods for Solving Systems of Linear Equations (Guass elimination, LU Decomposition. Cholesky Decomposition), Iterative methods (Jacobi. Gauss - Seidel Reduction Methods). Ordinary Differential Equations: Euler Method, Singlestep Methods, Runge-Kutta's Method, Multi-step Methods, Milne-Simpson Method. Methods Based on Numerical Integration, Methods Based on numerical Differentiation.

Unit -5 ELEMENTARY STATITICS Measures of dispersion-range, inter quartile range, Mean deviation, Standard deviation, moments, skewness and kurtosis. Probability, Continuous probability, probability density function and its applications (for finding the mean, mode, median and standard deviation of various continuous probability distributions) Mathematical expectation, expectation of sum and product of random variables. Theoretical distribution- binomial, Poisson distributions and their properties and use, Moment generating functions.

Reference Text Books:

1. Metric space numerical analysis and optional by Thakur,Shrivastava, Chandel & Rathore ;Ram Prasad Sons, Bhopal

2. Metric space numerical analysis and optional by Dr. H.K. Pathak ; Shiksha Sahitya Prakashan, Meerut.

Subject Code	Subject Name	Credits	Maximum marks Allotted					Total	Duration of Exam.	
			Theory			Practical			Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS604	ENGLISH LANGUAGE AND ASPECTS OF DEVELOPEMENT	2	35	10	5	-	-	50	3 hr	

Unit 1

1. William Wordsworth : "The World is Too Much With Us"

2. K. Aludiapillai : "Communication Education and Information Technology"

3. "Democratic Decentralisation"

4. S. C. Dubey : "Basic Quality of Life"

5. Sister Nivedita : "The Judgment Seat of Vikramaditya"

6. JuliunHuxley : "War as a Biological Phenomenon"

7. Robert Frost : "Stopping by Woods on a Snowy Evening"

8. Ruskin Bond : "The Cherry Tree"

Unit II Short Essay of about 250-300 words

Unit III Translation of a short passage from Hindi to English

Unit IV Drafting CV, writing e-mail message for official purpose

Unit V Language Skills :

One-word substitution, homonyms, homophones, words that confuse, Punctuation, Idioms

Note : Scheme of Marks

Unit I

- This will include 5 objective type questions based on text and language skills. (1x5=5 marks)
- This will also include short-answer questions from text. One question will be asked from each lesson (total 8 questions) and 5 have to be attempted (3x5 = 15 marks)

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			End Sem	Mid Sem	Assign.	End Sem	Term work			
BSCCS605	DBMS	2	35	10	5	-	-	50	3 hr	

UNIT- I

INTODUCTION TO DATABASE SYSTEM

Introduction To Database Systems Purpose of Database System,View Of Data,Characteristics of Database Approach, Architecture for a Database System, Advantages and Disadvantages Of DBMS, Database Users and Administrator, Database Design and ER Model , Data Model Classification.

UNIT-II

RELATIONAL DATABASE

Structure of Relational Database Database Schema, Key, Relational Operations Formal Relational Query Languages .

UNIT-III

RELATIONAL DATABASE DESIGN

Features of Good Database Design, Universal Relation, Anomalies in A Database

Atomic Domain and 1NF ,Functional Dependency Theory, Decomposition Using Functional Dependency Algotithm for Decomposition, Decomposition Using Multivalue Dependency More Normal Forms, Database Design Process.

UNIT-IV

DATABASE STORAGEAND QUERYING

Basic Concepts Of Indexing and Hashing Query Processing , Measures Of Query Cost , Query Processing for Select, Sort Join Operations. Basics of QueryOptimization, Transformation of Relational Expression Estimating Statistics of Expression, Choice of Evaluation Plan .

UNIT-V

TRANSACTION MANAGEMENT

Transaction Concepts, Features of Database Transaction. Concurrency Control inDatabase - Lock Base, Time Stamp Base, Validation Base Protocols Database Recovery System .

TEXT & REFERENCE BOOKS:

- *SILVERSCHATZ KORTH AND SUDARSHAN-DATABASE SYSTEM CONCEPTS, 6THED. TATA MC-GRAW HILL.*

- *RAGHU RAMA KRISHNAN-DATABASE MANAGEMENT SYSTEMS, 2NDED. TATA MC-GRAW HILL*

- *RAJESH NARANG – DATABASE MANAGEMENT SYSTEM,2ND ED.PHI*
- *R. ELMASRI ET. AL "FUNDAMENTALS OF DATABASE SYSTEMS". 3RD EDITION – ADDISON WESLEY, (INDIAN REPRINT), NEW DELHI.*

- *C.J.DATE, DATA BASE SYSTEMS*, Vol I & II