MAHARAJA AGRASEN INTERNATIONAL COLLEGE
NAAC Accredited B+
(Run By Shree Maharaja Agrasen Charitable Trust)
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MAHARAJA AGRASEN INTERNATIONAL COLLEGE, RAIPUR (C.G.)

(B+ Grade by NAAC Affiliated to Pt. Ravishankar Shukla University, Raipur)

Academic Year

2021-22

Syllabus for B.Sc. (Computer Science)

Department of Computer Science

MAHARAJA AGRASEN INTERNATIONAL COLLEGE

(B+ Grade by NAAC Affiliated to Pt. Ravishankar Shukla University, Raipur)

Department of Computer Science
Academic Year
2021-22
B.Sc. Third Year

Name of the Program: **B.Sc. III**		Program Code**: B.Sc.103**
Name of the Course: **Hindi language**		Max Marks: **75**
Course Code: **0891**	Total Duration- **84 Hr.**	

Course Objective:

पाठयक्रम में निहित साहित्य के अध्ययन द्वारा राष्ट्रीयता एवं सामाजिक भावना जागृत करवाना उद्देष्य है। अनेक विषयों से संबंधित लेखों के अध्ययन द्वारा विद्यार्थियों में तर्क वितर्क की क्षमता उत्पन्न करना। हिंदी भाषा की व्याकरणिक संरचना से अवगत करवाना। विभन्न समारोह हेतु पत्र लेखन में निपुण करना।

Syllabus

Unit	Topic	Duration (In Hours)	Marks
1	(क) भारत माता – सुमित्रानंदन पंत (ख) कथन की शैलियॉ विवरणात्मक शैली मूल्याकंन शैली व्याख्यात्मक शैली विचारात्मक शैली	**17**	**15**
2	(क) सूखी डाली – उपेन्द्र नाथ अश्क (ख) विभिन्न संरचनाएँ 1 विनम्रता सूचक संरचना 2 विधि सूचक संरचना 3 निषेध सूचक संरचना 4 काल बोधक संरचना 5 स्थान बोधक संरचना 6 दिशा बोधक संरचना 7 कार्य– करण सम्बन्ध संरचना 8 अनुक्रम संरचना	16	**15**
3	(क) वसीयत – मालती जोशी (ख) कार्यालयीन पत्र और आलेख 1 परिपत्र 2 आदेश 3 अधिसूचना 4 ज्ञापन 5 अनुस्मारक 6 पृष्ठाकंन	17	15
4	(क) योग की शक्ति – हरिवंष राय बच्चन (ख) अनुवाद – स्वरूप एवं परिभाषा उददेष्य स्त्रोत भाषा लक्ष्य भाषा अच्छे अनुवाद की विशेषताएँ	17	15

	अनुवाद की प्रक्रिया अनुवादक		
5	(क) संस्कृति और राष्ट्रीय एकीकरण – योगेश अटल (ख) घटनाओं , समारोहों आदि का प्रतिवेदन विभिन्न प्रकार के निमंत्रण पत्र	17	15

Course Outcomes

1. पाठयक्रम द्वारा विद्यार्थियों में देश प्रेम, मानवता एवम् चरित्र निर्माण के गुण विकसित होते हैं।
1. जीविकापार्जन हेतु कौशल विकास होता है।
2. मनन चिंतन के गुण पुष्ट होते हैं।
3. भारतीय संस्कृति एवं सभ्यता में प्रगाढ़ता आती है।
4. प्रतियोगी परीक्षाओं में पाठयक्रम सहायक है।

References:

1. हिन्दी भाषा एवं समसामयिकी – मध्यप्रदेश हिन्दी ग्रन्थ अकादमी
2. आधुनिक हिन्दी व्याकरण और रचना – डॉ॰ वासुदेवनन्दन प्रसाद

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Department of Computer Science
Academic Year
2021-22
B.Sc. Third Year

Name of the Program: **B.Sc. III**	Program Code: **123**
Name of the Course: **Foundation Course Paper II English Language**	Max. Marks: **75** Min. Marls: **26**
Course Code: **0892**	Total Duration: **78.4 hrs.**

Course Objective:

1. The primary objective of English learning is to equip the student with requisites of grammar.
2. The syllabus provides an in-depth knowledge about Indian culture, Indian Art and Tradition, Scientific knowledge and Literature content.
3. The focus of the subject is to generate adequate English Writing Skills and Presentation techniques.
4. There is extensive learning of the Prose Content and minimal learning of Poetry.
5. The step-by-step learning pattern of grammar is a positive trait of all the objectives

Unit	Topic	Duration (In Hours)	Marks
1	Essay type answer in about 200 words. 5 essay type question to be asked three to be attempted.	50 hrs.	15
2	Essay Writing	4 hrs.	15
3	Precis writing	4 hrs.	15
4	(a) Reading comprehension of an unseen passage (b) Vocabulary based on text	6 hrs.	15
5	Question on unit I and IV (b) shall be asked from the prescribed text. Which will comprise of popular create writing and the following items. Minimum needs housing and transport Geo-economic profile of M.P. communication Educate and culture. Women Empowerment Development, management of change, physical quality of life. War and human survival, the question of human social value survival, new Economic Philosophy Recent.	14.4 hrs.	15

Course outcome:

1. The student becomes well versed in grammar and its applicability.
2. The student is more connected to his/ her roots with the content of the syllabus.
3. The practice sessions of the Writing skills develop expertise of the students.
4. The prose content is easy to learn and its expression is simple.
5. Revision of grammar and question papers make the student handle his exams

Books Prescribed :

For B.A. /B.Sc./B.Com. /B.H.Sc. III year Foundation course, English Language:**Aspects of English Language And Development Published by M.P. Hindi Granth Academy, Bhopal..**

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Department of Computer Science
Academic Year
2021-22
B.Sc. Third Year

Name of the Program: **B.Sc. III**		Program Code:
Name of the Course: Math (I) Analysis		Max Marks: 50
Course Code: **0898**	Total Duration- 90 Hrs	(External: **50**)

Course Objective:

1. To deal with limits and related theories.
2. To deal with partial derivation, differentiability of function of two variables and implicit function, Improper integrals and their test of convergence, integration as a function of a parameter, Riemann Integral measure, infinite series, and analytic functions.
3. To studied in the context of real and complex numbers and functions.

Syllabus

Unit	Topic	Duration (In Hours)	Marks
1	Series of wiary terms Carergenes divergence and oscillation Abel's and Dirichlet's test Multiplication of series Double series Partial derivation and differentiability of real-valued functions of two variables Schwarz and Young's theorem Implicit function theorem. Fourier series for expansion of pioveise monotonic functions	18	10
2	Riemann integral, Integrability of continuous and monotonic functions. The fundamental theorem of gracalcals Mean value theorems of integral calculus. Improper integrals and their convergence Comparison tests. Abel's and Dirichlet tests. Integral as a function of a parameter, Continuity, derivability and integrability of an integral of a function of a parameter	18	10
3	Complex numbers as ordered pairs. Geometrical representation of complex numbers. Stereographic projection, Continuity and differentiability of complex functions. Analytic functions. Cauchy Riemann equations. Harmonic functions. Elementary functions, Mapping by elementary Functions, Mobius transformation. Fixed points, Cross ratio. Inverse points and critical mappings, Conformal mappings.	18	10

4	Definition and examples of metric spaces Neighborhoods, Limit points. Interior points Open and Closed sets, Closure and interior. Boundary points, Sub-space of a metric space. Cauchy sequences. Completeness. Cantor's intersection theorem. Contraction principle, construction of real numbers as the completion of the incomplete metric space of rationale. Real numbers as a complete ordered field	18	10
5	Dense subsets. Baire Category theorem Separable, second countable and first countable spaces. Continuous functions. Extension theorem. Uniform continuity, Isometry and homeomorphism. Equivalent metrics Compactness, sequential compactness. Totally bounded spaces. Finite intersection property Continuous function and Compact sets, Connectedness, Components. Continuous functions and Connected sets	18	10

Course Outcome: Students would able to

1. Deal with limits and related theories.
2. Deal with partial derivation, differentiability of function of two variables and implicit function, Improper integrals and their test of convergence, integration as a function of a parameter, Riemann Integral measure, infinite series, and analytic functions.
3. Studied in the context of real and complex numbers and functions.

References:

1. Analysis – H.K. Pathak

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Department of Computer Science
Academic Year
2021-22
B.Sc. Third Year

Name of the Program: **B.Sc. III**		Program Code:
Name of the Course: **Maths (II) Abstract Algebra**		Max Marks: **50**
Course Code: **0899**	Total Duration- **90 Hrs**	(External: **50**)

Course Objective: This Course will enable

1. To understand Group - Automorphisms, inner automorphism. Automorphism of groups Conjugacy relation. Normalizer, Counting principle and the class equation of a finite group, Sylow's theorems. Sylow subgroup.
2. To learn Ring theory, Field of quotients of an integral domain Euclidean ring, polynomial rings. Submodules. Quotient modules, Homomorphism and Isomorphisms theorems.
3. To understand vector spaces. Subspaces. Linear span. Linear dependence. Finite dimensional vector spaces. Existence of complementary subspace of a finite dimensional vector space.
4. To provide the knowledge of linear transformations and their representation as matrices. The Algebra of linear transformations. Dual space. dual space and natural isomorphism. Eigen values and eigenvectors of a linear transformation diagonalization.
5. To learn Inner product Spaces-Cauchy-Schwarz inequality. Orthogonal vectors. Orthogonal Complements. Bessel's inequality for finite dimensional spaces. Gram-Schmidt Orthogonalization process.

Syllabus

Unit	Topic	Duration (In Hours)	Marks
1	Group - Automorphisms, inner automorphism. Automorphism of groups and their computations. Conjugacy relation. Normalizer, counting principle and the class equation of a finite group, Center for Group of prime-order, Abelianizing of a group and its universal property. Sylow's theorems. Sylow subgroup. Structure theorem for finite Abelian groups.	18	10
2	Ring theory-Ring homomorphism. Ideals and quotient rings Field of quotients of an integral domain Euclidean rings, polynomial rings. Polynomials over the rational field The Eisenstein criterion, polynomial rings over commutative rings Unique factorization domain. Submodules. Quotient modules, Homomorphism and Isomorphisms theorems.	18	10

3	Definition and examples of vector spaces. Subspaces. direct sum of subspaces. Linear span. Linear dependence. independence and their basic properties. Basis. Finite dimensional vector spaces. Existence theorem for bases. Invariance of the number of elements of a basis set. Dimension. Existence of complementary subspace of a finite dimensional vector space. Dimension of sums of subspaces. Quotient space and its dimension.	18	10
4	Linear transformations and their representation as matrices. The Algebra of linear transformations. The rank nullity theorem. Change of basis. Dual space. dual space and natural isomorphism. Adjoint of a linear transformation. Eigen values and eigenvectors of a linear transformation Diagonalization Annihilator of a subspace, Bilinear Quadratic and Hermitian forms	18	10
5	Inner Product Spaces-Cauchy-Schwarz inequality. Orthogonal vectors. Orthogonal Complements. Orthonormal sets and bases. Bessel's inequality for finite dimensional spaces. Gram-Schmidt Orthogonalization process.	18	10

Course Outcome: Students will be able to

1. To understand Group - Automorphisms, inner automorphism. Automorphism of groups Conjugacy relation. Normalizer, Counting principle and the class equation of a finite group, Sylow's theorems. Sylow subgroup.
2. To learn Ring theory, Field of quotients of an integral domain Euclidean ring, polynomial rings. Submodules. Quotient modules, Homomorphism and Isomorphisms theorems.
3. To understand vector spaces. Subspaces. Linear span. Linear dependence. Finite dimensional vector spaces. Existence of complementary subspace of a finite dimensional vector space.
4. To provide the knowledge of linear transformations and their representation as matrices. The Algebra of linear transformations. Dual space. Bidual space and natural isomorphism. Eigen values and eigenvectors of a linear transformation diagonalization.
5. To learn Inner product Spaces-Cauchy-Schwarz inequality. Orthogonal vectors. Orthogonal Complements. Bessel's inequality for finite dimensional spaces. Gram-Schmidt Orthogonalization process.

References:

1. LN Heracin, Topics in Algebra, Wiley Eastern Ltd., New Delhi, 1975,
2. N. Jacobson, Basic Algebra, Vols. I & II. WH Freeman, 1980 (also published by Hindustan Publishing Company)
3. Shami Narayan, A Text Book of Modern Abstract Algebra, S. Chand & Co. New Delhi.
4. K.B. Datta Matrix and Linear Algebra. Prentice Hall of India Pvt. Ltd. New Delhi, 2000. P. Bhattacharya, S.K. Jain and S.R. Nagpal. Basic Abstract Algebra (2 Edition) Cambridge University Press, Indian Edition, 1997.
5. K. Hoffman and R. Kunze, Linear Algebra. (2nd Edition), Prentice Hall. Englewood Cliffs, New Jersey. 1971

6. S.K. Jain, A. Gunawardena and P.B. Bhattacharya. Basic Linear Algebra with MATLAB. Key College Publishing (Springer-Verlag) 2001
7. S. Kumaresan, Linear Algebra, A Geometric Approach, Prentice-Hall of India, 2000.
8. Vivek Sahai and Vikas Bist, Algebra, Norosa Publishing House, 1997.
9. 1S. Luther and L.B.S. Passi, Algebra, Vol. 1-Groups, Vol. 11-Rings Narosa Publishing House (Vol. 1-1996. Vol. 11-1999)
10. DS, Malik, J.N. Mordeson, and M.K. Sen, Fundamentals of Abstract Algebra, McGraw-Hill International

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Department of Computer Science
Academic Year
2021-22
B.Sc. Third Year

Name of the Program: **B.Sc. III**		Program Code: **BSc**
Name of the Course: Maths (III) **Discrete Mathematics**		Max Marks: **50**
Course Code: **0901**	Total Duration- **90 Hr**	

Course Objective:

1. Present concept and properties of various algebraic structure.
2. Develop the ability to form and evaluate conjectures.
3. Discuss the importance of algebraic properties relative to working within various number system.

Syllabus

Unit	Topic	Duration (In Hours)	Marks
1	Sets and Propositions: Cardinality Mathematical Induction Principle of Inclusion and exclusion. Computability and Formal Languages Ordered Sets Languages Phrase Structure Grammars. Permutations Combination Discrete Probability	18	10
2	Relation and Function: Binary Relation Equivalence Relation and Partition Partial Order Relation and Lattices Chains and Antichains. Pigeon Hole Principle Graph And Planer Graph: Basic Terminology Multigraph, Weighted Graph Path and Circuit, shortest Path Eulerian Path and Circuit Travelling Salesmen Problem Planner Graph, Tree	18	10
3	Finite State Machines: Equivalent Machine Finite State Machines as Recognizer Analysis of Algorithms – Time Complexity. Complexity of problems Discrete Numeric Function	18	10

	Generating function		
4	Linear Recurrence Relation with Constant Function	18	10
	Homogeneous Solution		
	Particular Solution		
	Total Solution		
	Solution by method of generating function.		
	Review of Group and Ring		
5	Boolean Algebra: Lattice and Algebraic Structure	18	10
	Duality, Distributive and Complement Lattice		
	Boolean Lattice and Boolean Algebra		
	Boolean Function and Expression		
	Propositional Calculus		
	Design and Implementation of Digital Network.		
	Switching Circuits		

Course Outcome: Students will be able to understand

1. logical concepts and to show logical equivalences by using truth tables
2. Learn concept related to counting.
3. Introduction to advanced counting.
4. Student Learn about the different type of Graph.
5. Understanding about Relation and Function.

References:

1. Discrete Mathematics (BSc. III) (H.K. Pathak).

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Department of Computer Science
Academic Year
2021-22
B.Sc. Third Year

Name of the Program: **B.Sc. III**		Program Code:
Name of the Course: **Physics (I) Relativity, Quantum Mechanics, Atomic Molecular and Nuclear Physics**		Max Marks: **50**
Course Code: **0893**	Total Duration- **90 Hrs**	(External: **50**)

Course Objective:

1. To connect the students with the idea of modern physics.
2. To enhance their ability to visualize microscopic behavior.
3. To inform them about the motion of particles (atomic size) with high speed and the concepts of relativity.
4. To give them knowledge about the fundamental forces and nuclear forces in deep.

Syllabus

Unit	Topic	Duration (In Hours)	Marks
1	Reference systems, inertial frames, Galilean invariance propagation of light, Michelson- Morley experiment, search for ether, Postulates for the special theory of Lorentz transformations, length contraction, time dilation, velocity addition, variation of mass with velocity, mass-energy equivalence, particle with zero rest mass.	18	10
2	Origin of the quantum theory: Failure of classical physics to explain the phenomena such as black-body spectrum, photoelectric effect, Compton effect, Wave-particle duality. uncertainty principle, de Broglie's hypothesis for matter waves, the concept of Phase and group velocities, experimental demonstration of mater waves. Davisson and Germer's experiment. Consequence of de Broglie's concepts, Bohr's complementary Principle, Bohr's correspondence principle, Bohr's atomic model, energies of a particle in a box, wave packets. Consequence of the uncertainty relation, gamma ray microscope. diffraction at a slit.	18	10
3	Quantum Mechanics: Schrodinger's equation, Statistical interpretation of wave function, Orthogonality and normalization of wave function, Probability current	18	10

	density, Postulatory basis of quantum mechanics, operators, expectation values. Ehrenfest's theorem, transition probabilities, applications to particle in a one- and three-dimensional boxes, harmonic oscillator in one dimension, reflection at a step potential, transmission across a potential barrier.		
4	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. Discrete set of electronic energies of molecules, quantization of vibrational and rotational energies, determination of inter-nuclear 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. Raman effect, Stokes and anti-Stokes lines, complimentary character of Raman and infrared spectra, experimental arrangements for Raman spectroscopy.	18	10
5	Structure of nuclei: - Basic Properties of Nuclei: (1) Mass, (2) Radii, (3) Charge, (4) Angular Momentum, (5) Spin. (5) Magnetic Moment (u), (6) Stability and (7) Binding Energy, Nuclear Models: - Liquid Drop Model, Mass formula, Shell Model, Types of Nuclear reactions, laws of conservation, Q-value of reactions, Interaction of Energetic particles with matter, Ionization chamber, GM Counter, Cloud Chambers, Fundamental Interactions. Classification of Elementary Particles, Particles and Antiparticles, Baryons, Hyperons, Leptons, and Mesons, Elementary Particle Quantum Numbers: Baryon Number, Lepton Number, Strangeness, Electric Charge. Hypercharge and Isospin, introductory idea of discovery of Higg's Boson.	18	10

Course Outcome: Students will be able to

1. Understand the behavior of particles at microscopic level.
2. Understand the concept of relativity and quantum physics.
3. Gain the idea of microscopic and atomic properties.
4. Understand the forces in nature and nuclear characteristics.

References:

1. H.S. Mani and G.K. Metha: "Introduction to Modern Physics (Affiliated East-West Press, 1989).
2. A Beiser, "Prospective of Modern Physics".
3. H.E. White, Introduction to Atomic Physic".
4. Barrow, "Introduction to Molecular Physics".
5. R.P. Feynman, R.B. Leighton and M Sands, "The Feynman Lectures on Physics", Vol.III (B.I. Publications, Bombay, Delhi, Calcutta, Madras).

6. T.A. Littlefield and N Thorley, "Atomic and Nuclear Physics" (Engineering Language Book Society)
7. H.A. Enge, "Introduction to Nuclear Physics", (Addision-Wesly)
8. Eisenberg and Resnick, "Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles" (John Wiley)
9. D.P. Khandelwal, "Optics and Atomic Physics", (Himalaya Publishing House, Bombay,1988).
10. Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi, 1984.
11. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).
12. Theoretical Nuclear Physics, J.M. Blatt & V.F Weisskopf (Dover Pub Inc., 1991).

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Department of Computer Science
Academic Year
2021-22
B.Sc. Third Year

Name of the Program: **B.Sc. III**		Program Code:
Name of the Course: **Physics (II) Solid State Physics, Solid State Devices and Electronics**		Max Marks: **50**
Course Code: **0894**	Total Duration- **90 Hrs**	(External: **50**)

Course Objective:

1. To connect the students with the concept of crystal structure.
2. To give the knowledge of behavior of magnetic domains in external magnetic fields.
3. To impart the knowledge of the basic electronic components and their applications.
4. To make the students learn about the digital laws.

Syllabus

Unit	Topic	Duration (In Hours)	Marks
1	Amorphous and crystalline solids, Elements of symmetry, seven crystal systems, Cubic lattices, Crystal planes, Miller indices, Laue's equation for X-ray diffraction, Bragg's Law, Bonding in solids classification. Cohesive energy of solid, Madelung constant, evaluation of Parameters, Specific heat of solids, classical theory (Dulong Petit's law), Einstein and Debye theories, Vibrational modes of one-dimensional monoatomic lattice, Dispersion relation, Brillouin Zone.	18	10
2	Free electron model of a metal, Solution of one-dimensional Schrodinger equation in a constant potential, Density of states. Fermi Energy. Energy bands in a solid (Kronig-Penny model without mathematical details), Difference between Metals, insulator and Semiconductors, Hall effect, Dia, Para and Ferromagnetism Langevin's theory of dia and para-magnetism, Curie Weiss's Law, Qualitative description of Ferromagnetism (Magnetic domains). B- H curve and Hysteresis loss	18	10
3	Intrinsic and extrinsic conductors, Concept of Fermi level, Generation and recombination of electron hole pairs in semiconductors, Mobility of electrons and holes, drift and diffusion currents, p-a Junction diode, depletion width and potential barrier, junction capacitance, I-V characteristics, Tunnel diode, Zener diode, Light emitting diode, solar-cell, Bipolar transistors, pnp and npn transistors,	18	10

	characteristics of transistors, different configurations. current amplification factor, FET and MOSFET Characteristics.		
4	Half and full wave rectifier, rectifier efficiency ripple factor, Bridge rectifier, Filters Inductor fitter, L. and pi section filters, Zener diode, regulated power supply using Zener diode, Applications of transistors, Bipolar Transistor as amplifier, h-parameter, CE equivalent circuit, Transistor as power amplifier, Transistor as oscillator, principle of an oscillator and Bark Hausen's condition, requirements of an oscillator, Wein-Bridge oscillator and Hartley oscillator	18	10
5	Digital Circuits Difference between Analog and Digital Circuits, Binary Numbers, Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Cates (Realization using Diodes and Transistor), NAND and NOR Cates as Universal Gates, XOR and XNOR Gate, De Morgan's Theorems, Boolean Laws, Simplification of Logic Circuit using Boolean Algebra, Digital to Analog Converter, Analog to Digital Converter.	18	10

Course Outcome: Students will be able to

1. Understand the crystal structure.
2. Understand the behavior of magnetic domains in external magnetic fields.
3. Understand the basic electronic components and their applications.
4. Imply the digital laws to minimize a complicated electrical circuit.

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Department of Computer Science
Academic Year
2021-22
B.Sc. Third Year

Name of the Program: **B. Sc (III)**		Program Code: **B.Sc (CS) III**
Name of the Course: **Computer Hardware**		Max Marks: **50**
Course Code: **0909**	Total Duration- **77 Hr**	(Internal: **10** + External: **50**)

Course Objective:

1. To introduce the overall organization of the microcomputers and operating systems.
2. To introduce the interaction of common devices used with computers with operating softwares, excluding the Assembly languages, with special reference to DOS/WINDOWS.
3. To introduce the working of hardware components, Micro-Processor and various chips used in micro-computers by operating system, without the use of electronic circuitry.
4. To introduce the use of operating systems architecture with IBM-PC & clones, excluding Assembly language, with forms an important part of hardware's.

Syllabus

Unit	Topic	Duration (In Hours)	Marks
1	Introduction & organization of Micro-Computer: (a) Basic Components of Micro-computer: Basic Block; Prom ram memory; Data memory; I/O Ports; Clock generator; Integration of functional blocks.	16	10
	Interconnecting Components in a Micro-computer: Necessary functional block; Bussed architecture for microcomputer; memory addressing; Addressing I/O ports; comparison of I/O mapped and memory mapped I/O.		
	Input Output Techniques: Non-CPU devices, Program & interrupt controlled I/O; Hardware controlled I/O or DMA.		
	General understanding of different µ P or CPU: Intel 8088, 286, 386, 486, 586 Pentium, P54C, MMX P55C; Motorola 6800 & 88100 series; CYRIX & AMD CPUs.		
	The Registers of CPU: (Give Example of P-8088) Register organization of 8088, Scratch pad segment, pointer, Index and Flag, Registers.		
	Memory addressing modes of P-8088: Segment offset; Data addressing modes; Addressing for branch instructions.		
	I/O Addressing with P-8088: Memory mapped I/O & I/O mapped I/O.		
2	Hardware Organization of the Personal Computer: (a) Block diagram with various parts of PC. (b) The Mother Board of General P.C.: 8088 CPU; ROM & RAM;	15	10
	Keyboard & its interface; System timer/counters; Hardware interrupt vectoring; DMA controller & channels; Interfacing to audio speaker; Bus slots & facture cards.		

	The Serial I/O ports, COM-1 & COM-2, The parallel Port for Printer, Expansion Slots for RAM.		
	Disk Controllers: For floppy, Hard disk, CD-ROM & Cassets drives.		
	The Video Display of PCs: (a) Video Monitors; Monochrome and colour. (b) Video Display Adapters & Their Video Modes; Monochrome & colour graphics adapters.		
	c) Video Control Through ANSI-SYS. (d) Video Control Through ROM-BOIS: INT 10H		
	e) Direct Video Control; Monochrome & colour graphics adapters. (f) Installing Customized Character Sets.		
3	The ROM-BIOS Services: (a) Introduction to UNIX, ENIX, SUN, Solaris, DOS & MAC with special reference to DOS & Windows, its ver., as DOS becomes more popular than others in PCs. (b) The ROM-BIOS Diskette Services, INT 13H. (c) The ROM-BIOS Serial Port Services, INT 14H	15	10
	The ROM-BIOS Keyboard Services, INT 16H. (e) The ROM-BIOS Printer Services, INT 17H. (f) Miscellaneous Service Provided by the ROM-BIOS: INT 05H, INT 11H, INT 12H, INT 18H, INT 19H, INT 1AH.		
	The fundamental of Operating System viz. DOS/WINDOWS: (a) The loading of DOS & Its Basic Structure; ROM bootstrap, IO.SYS, DOS.SYS & Command.COM.		
	b) The Execution of the programs under DOS; EXEC functions, program segment prefix; Features of COM & EXE program files. (c) Device Handling by Dos; FDD, HDD, CON, Keyboard, PRN, AUX, CLOCK and NUL devices; Block devices; Character devices; Driver installation sequence.		
	File Structures of DOS; (e) The DOS Interrupts: INT 20H-2FH		
	f) The DOS functions through INT 21H; Discuss only the understanding part of various other DOS function to handle hard & softwares. (g) Installation of windows: Important system files in windows.		
4	1. Disk and Files under DOS: (a) Logical Structure of a Disk: Organization of disk for use; Boot record; FAT B.Sc.-III (50) files; disk or root directory.	16	10
	File Organization on a DOS disk: Logical volumes; Sub directories; Volume labels		
	c) Manipulating Files under DOS: File attributes; date and time, file Access; FCB functions.		
	Memory Allocation, Program Loading and Execution: (a) Memory Management under DOS: EXEC loader; Memory Management & its functions; Modifying a Program's memory allocation.		
	(b) Loading and Executing Programs under DOS: The EXEC function; Memory considerations; parameter blocks; calling & returning from EXEC.		
	(c) Loading the program overlays through EXEC.		
5	ORGANISATION OF HARDWARE BY OPERATING SYSTEM: 1. Interrupt Handling through DOS: (a) Types of interrupts. (b) Interrupt Vector Table in PC	15	10
	Interrupt Service Routines. (d) Special Interrupts in PC: Clock Interrupt; The -C or Break Interrupt; DOS reserved interrupt INT 28H; Patching		

	memory resident routines.		
	2. Filters for DOS: (a) Filters in operating systems. (b) Redirection of I/O under DOS. (c) The Filters Supplied with DOS. (d) Writing Filters to run under DOS		
	3. Handling of Various Versions of Windows O.S.: (a) Setup Installation (b) Trouble shooting (c) Networking features		

Course Outcome: Students will be able to

1. Identify the hardware components of a computer.
2. Lists the hardware components such as processor, memory, disk, main board, etc.
3. Explains the features (speed, capacity, etc.) of the hardware components of a computer.
4. Explains the relationships between the components of a computer and how data are transferred among the components.
5. identify the peripheral devices outside computer.
6. Uses computer using input devices, such as keyboard and mouse.
7. Transfers data outside the computer using output devices, such as screen and printer.
8. Saves files to removable devices and loads files from removable devices.
9. Connects to the Internet using network cards.

References:

Text Book:
1. Hardware and Software of Personal Computers. By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).
Supporting Text Books:
1. Digital System from Gates to Microprocessor. By Sanjay K. Bose. (Wiley Eastern Ltd. New Delhi).
2. Computer Fundamentals: Architecture & Organization. By B. Ram. (Wiley Eastern Ltd. New Delhi).
3. IBM PC-XT and Clones: By Govinda Rajalu.
4. Microprocessor and interfacing: By Douglas Hall.
5. Insight the IBM-PC: Peter Norton.
6. Microprocessor System: 8086/8088 family architecture, programming & design: By Liu and Gibson

MAHARAJA AGRASEN INTERNATIONAL COLLEGE

(B+ Grade by NAAC Affiliated to Pt. Ravishankar Shukla University, Raipur)

Department of Computer Science
Academic Year
2021-22
B.Sc. Third Year

Name of the Program: **B. Sc (Computer Science)**		Program Code: B.Sc. III
Name of the Course: **Computer Software**		Max Marks: **50**
Course Code: **0910**	Total Duration- 90 Hr	Min. Marks: 17

Course Objective:

1. To introduce Data Base Management system concepts
2. To introduce the Relational Database Management System and Relational Database Design
3. To Introduce the RDBMS software and utility of query Language.
4. Introduce basic concept of all Programming and database connectivity using visual Basic

Unit	Topic	Duration (In Hours)	Marks
1	Introduction to DBMS - Purpose of Data base systems, view of data.	18	10
	Data Modeling Database Languages,		
	Transaction management, Storage Management, Database Administrator and User, Database System Structure		
	E-R Model: Basic concepts, Constraints, Keys,		
	Mapping Constraint, E-R Diagram,		
	Weak and Strong Entity sets,		
	E-R Database Schema, Reduction of an E-R Schema to Table.		
2	Relational Model: Structure of Relational Database,	18	10
	Relational Algebra, Domain Relational Calculus,		
	Extended Relational- Algebra Operation, Modification of database, Views.		
	Relational Database Design: Pitfalls in Relational Database Desing,		
	Decomposition functional Dependencies, Normalization:		
	1NF, 2NF,		
	BCNF,3NF, 4NF,5NF		
3	Introduction: Introduction to personal and Enterprises Oracle, Data Types, Commercial Query Language, SQL, SQL*PLUS. DDL and DML: Creating Table,	18	10
	Specifying Integrity Constraint Modifying Existing Table, Dropping Table, Inserting Deleting and Updating Rows in as Table,		
	Where Clause, Operators, ORDER BY, GROUP Function, SQL Function, JOIN, Set Operation, SQL. Sub Queries.		
	Views: What is Views: Create, Drop and Retrieving data from views		
	Security: Management of Roles, Changing Password, Granting Roles & Privilege, with drawing privileges		

	PL/SQL: Block Structure in PL/SQL. Variable and constants, Running PL/SQL in the SQL PLUS		
	Data base Access with PL/SQL, Exception Handling, Record Data type in PL/SQL, Triggers in PL/SQL.		
4	Introduction to Visual Basic Event Driven Programming, IDE, Introduction to object, controlling objects, Models and vents, Working with Fore,	18	10
	MDI Form Working with standard Controls. Overview of Variables, Declaring, Scope,		
	Arrays, User defined data types, Constants, Working with procedures: Function, subroutine, and Property		
	Working with Data, Time, Format, String, and Math's Function, Controlling Program execution:		
	Comparison and logical Operators, If …Then statements,		
	Select Case Statement, Looping Structures, exiting a loop. Error Trapping and Debugging.		
	File Organization: Saving data to file, Sequential and Random-access file, the desing and coding		
5	Introduction - Concept of DRO,	18	10
	RDO, ADO		
	input validation field & form level validation, ADD object model: the ADD object Hierarchy, the connection object. the connection object, the command object, record set , parameter object, field object, record object, stream object. Error object, parameter object.		
	Using Bound control to Present ADO data: Using the ADD data control, ADO data control properties,		
	binding simple controls: Data list, data combo, Data Grid, Data Form Wizard: single form wizard, Grid form, master/Detail form. Programming the ADD data control: Refresh method, Event,		
	Hierarchical flex Grid control. Data Environment & Data Report: Creating connection, Using command object in the data Environment, Data Environment option and operation, Binding Form to the data environment		
	ADO Events in the Data report, Print Preview, Print, Export, Data report in code: Data reports Events, Binding data reports Directly		

Course Outcome: At the end of the course, the students will develop ability to

1. Define the basic concepts of DBMS,
2. Design entity relationship model and relational model, integrity constraints.
3. Apply SQL to insert, delete and retrieve data from databases.
4. Convert entity relationship diagrams into RDBMS and formulate SQL queries on respective data.

References:

1. Data Base System Concept: By Hery F. Korth, Tata McGraw Hill
2. Fundamental of Data Base System Concept: Nawathe & Elmasri (Pearson educations)
3. Oracle Complete Reference: By Oracle Press
4. Introduction to COPS & VB: By V.K. Jain, Vikas Publishing House
5. Database Programming VB 6 PACTICALS: By B.P.B. Publication