VEER BAHADUR SINGH PURVANCHAL UNIVERSITY,

JAUNPUR

EVALUATION SCHEME & SYLLABUS
First Year
FOR

MASTER OF COMPUTER APPLICATIONS (MCA)
(Two Year Course)

Based On
NEP 2020
(Effective from the Session: 2025-26)

Total 21 pages

21/5/25 21/05/25

MCA (MASTER OF COMPUTER APPLICATIONS)
MCA FIRST YEAR, 2025-26

SEMESTER-I

S. No.	Subject Code	Subject Name	Periods			Sessional			ESE	Total	Credit
			L	T	P	CT	TA	Total			
1.	NMC101	Fundamental of Computers& Emerging Technologies	3	0	0	20	10	30	70	100	3
2.	NMC102	Problem Solving using C	3	1	0	20	10	30	70	100	4
3.	NMC103	Principles of Management & Communication	3	0	0	20	10	30	70	100	3
4.	NMC104	Discrete Mathematics	3	0	0	20	10	30	70	100	3
5.	NMC105	Computer Organization & Architecture	3	1	0	20	10	30	70	100	4
6.	NMC151	Problem Solving using C **Lab**	0	0	4	30	20	50	50	100	2
7.	NMC152	Computer Organization & Architecture **Lab**	0	0	3	30	20	50	50	100	2
8.	NMC153	Professional Communication **Lab**	0	0	2	30	20	50	50	100	2
9.	NMC106	Cyber Security*	2	0	0	20	10	30	70	100	0
		Total						**330**	**570**	**900**	**23**

CT: Class Test **TA**: Teacher Assessment **L/T/P**: Lecture/Tutorial/Practical

***Qualifying Non-credit Course**

SEMESTER-II

S. No.	Subject Code	Subject Name	Periods			Sessional			ESE	Total	Credit
			L	T	P	CT	TA	Total			
1.	NMC201	Web Technology	3	0	0	20	10	30	70	100	3
2.	NMC202	Object Oriented Programming	3	0	0	20	10	30	70	100	3
3.	NMC203	Operating Systems	3	0	0	20	10	30	70	100	3
4.	NMC204	Database Management Systems	3	0	0	20	10	30	70	100	3
5.	NMC205	Data Structures & Analysis of Algorithms	4	0	0	20	10	30	70	100	4
6.	NMC251	Web Technology **Lab**	0	0	3	30	20	50	50	100	2
7.	NMC252	Object Oriented Programming **Lab**	0	0	3	30	20	50	50	100	2
8.	NMC253	DBMS **Lab**	0	0	2	30	20	50	50	100	1
9.	NMC254	Data Structures & Analysis of Algorithms **Lab**	0	0	3	30	20	50	50	100	2
10.	BVA251	Sports and Yoga**	0	0	3	-	100	-	-	-	0
		Total						**350**	**550**	**900**	**23**

CT: Class Test **TA**: Teacher Assessment **L/T/P**: Lecture/Tutorial/Practical

****Non-credit Course**

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Syllabus

MCA1st Year Ist Semester

MCA (MASTEROFCOMPUTERAPPLICATIONS) FIRST YEAR SYLLABUS
SEMESTER-I

NMC101:FUNDAMENTALOFCOMPUTERS&EMERGINGTECHNOLOGIES		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course, the student will be able to		
CO 1	Demonstrate the knowledge of the basic structure, components, features and generations of computers.	K_1, K_2
CO 2	Describe the concept of computer languages, language translators and construct algorithms to solve problems using programming concepts.	K_2, K_3
CO 3	Compare and contrast features, functioning & types of operating system and Computer net works.	K_4
CO 4	Demonstrate architecture, functioning & services of the Internet and basics of multimedia.	K_2
CO 5	Illustrate the emerging trends and technologies in the field of Information Technology.	K_1, K_2
DETAILEDSYLLABUS		**3-0-0**
Unit	**Topic**	**Proposed Lecture**
I	**Introduction to Computer:** Definition, Computer Hardware& Computer Software **Components:** Hardware – Introduction, Input devices, Output devices, Central Processing Unit, Memory-Primary and Secondary. Software-Introduction, Types – System and Application. **Computer Languages:** Introduction, Concept of Compiler, Interpreter & Assembler **Problem solving concept:** Algorithms – Introduction, Definition, Characteristics, Limitations, Conditions in pseudo-code, Loops in pseudo code.	**08**
II	**Operating system:** Definition, Functions, Types, Classification, Elements of command based and GUI based operating system. **Computer Network:** Overview, Types (LAN, WAN and MAN),Data communication, topologies.	**08**
III	**Internet:** Overview, Architecture, Functioning, Basic services like WWW, FTP, Telnet, Gopher etc., Search engines, E-mail, Web Browsers. **Internet of Things (IoT):** Definition, Sensors, their types and features, Smart Cities, Industrial Internet of Things.	**08**
IV	**Block chain:** Introduction, overview, features, limitations and application areas fundamentals of Block Chain. **Crypto currencies:** Introduction, Applications and use cases **Cloud Computing**: nature and benefits, AWS, Google, Microsoft & IBM Services	**08**
V	**EmergingTechnologies:**Introduction,overview,features,limitationsandapplication areas of Augmented Reality, Virtual Reality, Grid computing, Green computing, Big data analytics, Quantum Computing and Brain Computer Interface	**08**

Suggested Readings:

1. RajaramanV.,"FundamentalsofComputers",Prentice-HallofIndia.
2. NortonP.,"IntroductiontoComputers",McGrawHillEducation.
3. GoelA.,"ComputerFundamentals",Pearson.
4. BalagurusamyE.,"FundamentalsofComputers",McGrawHill.
5. TharejaR.,"FundamentalsofComputers",OxfordUniversityPress.
6. BindraJ.,"TheTechWhisperer-onDigitalTransformationandtheTechnologiesthatEnableit",Penguin Books.

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NMC102:PROBLEMSOLVINGUSINGC		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course, the student will be able to		
CO1	Describe the functional components and fundamental concepts of a Digital computer system including number systems.	K_1, K_2
CO2	Construct flow chart and write algorithms for solving basic problems.	K_2, K_3
CO3	Write 'C' programs that incorporate use of variables, operators and expressions along with data types.	K_2, K_3
CO4	Write simple programs using the basic elements like control statements, functions, arrays and strings.	K_2, K_3
CO5	Write advanced programs using the concepts of pointers, structures, Unions and enumerated data types.	K_2, K_3
CO6	Apply pre-processor directives and basic file handling and graphics Operations in advanced programming.	K_2, K_3
DETAILEDSYLLABUS		**3-1-0**
Unit	**Topic**	**Proposed Lecture**
I	**Basics of programming:** Approaches to problem solving, Use of high-level programming language for systematic development of programs, Concept of algorithm and flowchart, Concept and role of structured programming. **Basics of C**: History of C, Salient features of C, Structure of C Program, Compiling C Program, Link and Run C Program, Character set, Tokens, Keywords, Identifiers, Constants, Variables, Instructions, Data types, Standard Input/output, Operators and expressions.	**08**
II	**Conditional Program Execution:** if, if-else, and nested if-else statements, Switch statements, Restrictions on switch values, Use of break and default with switch, Comparison of switch and if-else. **Loops and Iteration:** for, while and do-while loops, Multiple loop variables, Nested loops, Assignment operators, break and continue statement. **Functions:**Introduction,Types,DeclarationofaFunction,Functioncalls, Defining functions, Function Prototypes, Passing arguments to a function Return values and their types, Writing multifunction program, Calling function by value, Recursive functions.	**08**
III	**Arrays:** Array notation and representation, Declaring one-dimensional array, Initializing arrays, Accessing array elements, Manipulating array elements, Arrays of unknown or varying size, Two-dimensional arrays, Multidimensional arrays. **Pointers:** Introduction, Characteristics, * and & operators, Pointer type declarationandassignment,Pointerarithmetic,Callbyreference,Passing pointers to functions, array of pointers, Pointers to functions, Pointer to pointer, Array of pointers. **Strings:** Introduction, Initializing strings, Accessing string elements, Array of strings, Passing strings to functions, String functions.	**08**

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IV	**Structure:** Introduction, Initializing, defining and declaring structure, Accessing members, Operations on individual members, Operations on structures, Structure within structure, Array of structure, Pointers to structure. **Union:** Introduction, Declaring union, Usage of unions, Operations on union. Enumerated data types **Storage classes**: Introduction, Types- automatic, register, static and external.	**08**
V	**Dynamic Memory Allocation**: Introduction, Library functions –malloc, calloc, realloc and free. **File Handling:** Basics, File types, File operations, File pointer, File opening modes, File handling functions, File handling through command line argument, Record I/O in files. **Graphics:** Introduction,Constant,Datatypesandglobalvariablesusedin graphics, Library functions used in drawing, Drawing and filling images, GUI interaction within the program.	**08**

Suggested Readings:

1. KanetkarY.,"LetUsC",BPBPublications.
2. HanlyJ.R.andKoffmanE.B.,"ProblemSolvingandProgramDesigninC",PearsonEducation.
3. SchildtH.,"C-TheCompleteReference",TataMcGraw-Hill.
4. GoyalK.K.andPandeyH.M.,"TroubleFreeC",UniversitySciencePress
5. GottfriedB.,"Schaum'sOutlines-ProgramminginC",TataMcGraw-HillPublications.
6. KochanS.G.,"ProgramminginC",Addison-Wesley.
7. DeyP.andGhoshM.,"ComputerFundamentalsandProgramminginC",OxfordUniversityPress.
8. GoyalK.K.,SharmaM.K.andThapliyalM.P."ConceptofComputerandC Programming", UniversitySciencePress.

NMC103:PRINCIPLESOFMANAGEMENT&COMMUNICATION		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course, the student will be able to		
CO1	Describe primary features, processes and principles of management.	K_1, K_2
CO2	Explain functions of management in terms of planning, decision making and organizing.	K_3, K_4
CO3	Illustrate key factors of leadership skill in directing and controlling business resources and processes.	K_5, K_6
CO4	Exhibit adequate verbal and non-verbal communication skills	K_1, K_3
CO5	Demonstrate effective discussion, presentation and writing skills.	K_3, K_5
DETAILEDSYLLABUS		**3-0-0**
Unit	**Topic**	**Proposed Lecture**
I	**Management**: Need, Scope, Meaning and Definition. The process of Management, Development of Management thought F.W. Taylorand Henry Fayol, Harthorne Studies, Qualities of an Efficient Management.	**08**
II	**Planning & Organizing:** Need, Scope and Importance of Planning, Steps in planning, Decision making model. Organizing need and Importance, Organizational Design, Organizational structure, Centralization and Decentralization, Delegation.	**08**
III	**Directing & Controlling:** Motivation—Meaning, Importance, need. Theories of Motivation, Leadership—meaning, need and importance, leadershipstyle,Qualitiesofeffectiveleader,principlesofdirecting, Basic control process, Different control Techniques.	**08**
IV	**Introduction to Communication:** What is Communication, Levels of communication, Barriers to communication, Process of Communication, Non-verbal Communication, The flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group) Communication, Technology Enabled communication, Impact of Technology, Selection of appropriate communication Technology, Importance of Technical communication.	**08**
V	**Business letters:** Sales & Credit letters; Claim and Adjustment Letters; Job application and Resumes. **Reports:** Types; Structure, Style & Writing of Reports. **Technical Proposal:** Parts; Types; Writing of Proposal; Significance. Nuances of Delivery; Body Language; Dimensions of Speech: Syllable; Accent; Pitch; Rhythm; Intonation; Paralinguistic features of voice; Communication skills, Presentation strategies, Group Discussion; Interview skills; Workshop; Conference; Seminars.	**08**

Suggested Readings:

1. TripathiP.C.andReddyP.N.,"PrinciplesofManagement",McGrawHillEducation.
2. GuptaC.B.,"ManagementPrinciplesandPractice",SultanChand&Sons.
3. ChhabraT.N.,"BusinessCommunication",SunIndiaPublication.
4. AroraV.N.andChandraL.,"ImproveYourWriting",OxfordUniversityPress.
5. RaniM.andVermaS.,"TechnicalCommunication:APracticalApproach",AcmeLearning.
6. RamanM.andSharmaS.,"TechnicalCommunication-PrinciplesandPractices",OxfordUniversityPress.
7. HaroldK.andHeinzW.,"EssentialsofManagement",TataMcGrawHill.
8. RobbinsS.P.andCoulterM.K.,"Management",PearsonPrenticeHall.
9. StonerJ.AF,FreemanR.E.andGilbertD.R.,"Management",PearsonEducation.
10. ChaturvediP.D.,"BusinessCommunication",PearsonEducation.

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NMC104:DISCRETEMATHEMATICS		
Course Outcome (CO)	**Bloom's Knowledge Level (KL)**	
At the end of course, the student will be able to		
CO1	Usemathematicalandlogicalnotationtodefineandformallyreasonaboutbasic discrete structures such as Sets, Relations and Functions	K_1,K_2
CO2	Apply mathematical arguments using logical connectives and quantifiers to check the validity of an argument through truth tables and propositional and predicate logic	K2,K3
CO3	Identify and prove properties of Algebraic Structures like Groups, Rings And Fields	K_3,K_4
CO4	Formulate and solve recurrences and recursive functions	K_3,K_4
CO5	Apply the concept of combinatorics to solve basic problems in discrete mathematics	K_1,K_3
DETAILED SYLLABUS		**3-0-0**
Unit	**Topic**	**Proposed Lecture**
I	**Set Theory:** Introduction, Size of sets and Cardinals, Venn diagrams, Combination of sets, Multisets, Ordered pairs and Set Identities. **Relation:** Definition, Operations on relations, Composite relations, Properties of relations, Equality of relations, Partial order relation. **Functions:** Definition, Classification of functions, Operations on functions, Recursively defined functions.	**08**
II	**Posets, Hasse Diagram and Lattices:** Introduction, Partial ordered sets, Combination of Partial ordered sets, Hasse diagram, Introduction of lattices, Properties of lattices – Bounded, Complemented, Modular and Complete lattice. **Boolean Algebra:** Introduction, Axioms and Theorems of Boolean algebra, Boolean functions. Simplification of Boolean functions, Karnaugh maps, Logic gates.	**08**
III	**Propositional:** Propositions, Truthtables, Tautology, Contradiction, Algebra of Propositions, Theory of Inference and Natural Detection. **Predicate Logic:** Theory of Predicates, First order predicate, Predicate formulas, Quantifiers, Inference theory of predicate logic.	**08**
IV	**Algebraic Structures:** Introduction to algebraic Structures and properties. Types of algebraic structures: Semi group, Monoid, Group, Abelian group and Properties of group. Subgroup, Cyclic group, Cosets, Permutation groups, Homomorphism and Isomorphism of groups. **Rings and Fields:** Definition and elementary properties of Ringsand Fields.	**08**
V	**Natural Numbers:** Introduction, Piano's axioms, Mathematical Induction, Strong Induction and Induction with Nonzero Base cases. **Recurrence Relation& Generating functions:** Introduction and properties of Generating Functions. Simple Recurrence relation with constant coefficients and Linear recurrence relation without constant coefficients. Methods of solving recurrences. **Combinatorics:** Introduction, Counting techniques and Pigeonhole principle, Polya's Counting theorem.	**08**

Suggested Readings:

1. RosenK.H.,"DiscreteMathematicsandItsApplications",McGrawHill.
2. KolmanB.,BusbyR.CandRossS.C.,"DiscreteMathematicsStructures",PrenticeHall.
3. GirimaldiR.P,"DiscreteandCombinatorialMathematics",AddisonWesley.
4. SinghY.N.,"DiscreteMathematicalStructures",Wiley-India.
5. SarkarS.,"ATextbookofDiscreteMathematics",S.Chand&CompanyPVT. LTD.
6. KrishnamurthyV.,"CombinatoricsTheory&Application",East-WestPressPvt.Ltd.
7. LiptschutzS.andLipsonM.C.,"DiscreteMathematics",McGrawHill.
8. Trembely J.P. and Manohar R., "Discrete Mathematical Structure with application to Computer Science", McGraw Hill.

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NMC105:COMPUTERORGANIZATION&ARCHITECTURE		
Course Outcome (CO)	**Bloom's Knowledge Level (KL)**	
At the end of course, the student will be able to		
CO 1	Describe functional units of digital system and explain how arithmetic and logical operations are performed by computers	K_2, K_3
CO 2	Describe the operations of control unit and write sequence of instructions for carrying out simple operation using various addressing modes.	K_2, K_4
CO 3	Design various types of memory and its organization.	K_3
CO 4	Describe the various modes in whichIOdevicescommunicatewithCPU And memory.	K_2, K_3
CO 5	List the criteria for classification of parallel computer and describe various architectural schemes.	K_1, K_2
DETAILEDSYLLABUS		**3-1-0**
Unit	**Topic**	**Proposed Lecture**
I	**Introduction:** Functional units of digital system and their interconnections, buses, bus architecture, types of buses and bus arbitration. Register, bus and memory transfer. **Processor organization:** general registers organization, stack organization and addressing modes.	**08**
II	**Arithmetic and logic unit:** Look ahead carries adders. Multiplication: Signed operand multiplication, Booths algorithm and array multiplier. Division and logic operations. Floating point arithmetic operation, Arithmetic & logic unit design. IEEE Standard for Floating Point Numbers.	**08**
III	**Control Unit:** Instruction types, formats, instruction cycles and sub cycles (fetch and execute etc.), micro-operations, execution of a complete instruction. Program Control, Reduced Instruction Set Computer, Pipelining. Hardwire and micro programmed control: micro-program sequencing, concept of horizontal and vertical Microprogramming.	**08**
IV	**Memory:** Basic concept and hierarchy, semiconductor RAM memories, 2D & 21/2D memory organization. ROM memories. Cache memories: concept and design issues & performance, address mapping and replacement Auxiliary memories: magnetic disk, magnetic tape and Optical disks Virtual memory: concept implementation.	**08**
V	**Input/output:** Peripheral devices, I/O interface, I/O ports, Interrupts: interrupt hardware, types of interrupts and exceptions. Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access., I/O channels and processors. Serial Communication: Synchronous & asynchronous communication, Standard communication interfaces.	**08**

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Suggested Readings:

1. ManoM.M.,"ComputerSystemArchitecture",PHI.
2. HamacherC.,VranesicZ.andZakyS.,"ComputerOrganization",McGraw-Hill.
3. HayesJ.P.,"ComputerArchitectureandOrganization",TataMcGrawHill.
4. StallingsW.,"ComputerOrganizationandArchitecture-DesigningforPerformance",Pearson Education.
5. ParahamiB.,"ComputerArchitecture",OxfordUniversityPress.
6. PattersonD.A.andHennessyJ.L.,"ComputerArchitecture-AQuantitativeApproach", Elsevier Pub.
7. TannenbaumA.S.,"StructuredComputerOrganization",PHI.

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NMC151:PROBLEMSOLVINGUSINGCLAB		
Course Outcome (CO)		**Bloom's Knowledge Level(KL)**
At the end of course, the student will be able to		
CO1	Write, compile, debug and execute programs in a C programming environment.	K_3
CO2	Write programs that in corporate use of variables, operators and expressions along with data types.	K_3
CO3	Write programs for solving problems involving use of decision control structures and loops.	K_3
CO4	Write programs that involve the use of arrays, structures and user defined functions.	K_3
CO5	Write programs using graphics and file handling operations.	K_3

1. Program to implement conditional statements in C language.
2. Program to implement switch-case statement in C language
3. Program to implement looping constructs in C language.
4. Program to perform basic input-output operations in C language.
5. Program to implement user defined functions in C language.
6. Program to implement recursive functions in C language.
7. Program to implement one-dimensional arrays in C language.
8. Program to implement two-dimensional arrays in C language.
9. Programtoperformvariousoperationsontwo-dimensionalarraysinClanguage.
10. Program to implement multi-dimensional arrays in C language.
11. Program to implement string manipulation functions in C language.
12. Program to implement structure in C language.
13. Program to implement union in C language.
14. Program to perform file handling operations in C language.
15. Program to perform graphical operations in C language.

Note: The Instructor may add/delete/modify experiments, wherever he/she feels in a justified manner.

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NMC152:COMPUTERORGANIZATION&ARCHITECTURELAB		
Course Outcome (CO)		**Bloom's Knowledge Level(KL)**
At the end of course, the student will be able to		
CO1	Design and verify combinational circuits (adder, code converter, decoder, multiplexer) using basic gates.	K_6
CO2	Design and verify various flip-flops.	K_3
CO3	Design I/O system and ALU.	K_3
CO4	Demonstrate combinational circuit using simulator	K_2

1. Implement HALF ADDER, FULL ADDER using basic logic gates.
2. Implement Binary-to-Gray, Gray-to-Binary code conversions.
3. Implement3-8lineDECODER.Implementing4x1and8x1MULTIPLEXERS.
4. Verify the excitation tables of various FLIP-FLOPS.
5. Design ofan8-bitInput/Output system withfour8-bitInternalRegisters.
6. Design ofan8-bitARITHMETICLOGICUNIT.
7. Designthedatapathofacomputerfromitsregistertransferlanguagedescription.
8. Designthecontrolunitofacomputerusingeitherhardwiringormicroprogramming based on its register transfer language description.
9. Implement a simple instruction set computer with a control unit and a data path.

Note: The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner.

NMC153:PROFESSIONALCOMMUNICATIONLAB		
Course Outcome (CO)		**Bloom's Knowledge Level(KL)**
At the end of course, the student will be able to		
CO1	Develop the ability to work as a team member as an integral activity in the workplace.	K_3
CO2	Increase confidence in their ability to read, comprehend, organize, and retain written information. Improve reading fluency.	K_4
CO3	Write coherent speech outlines that demonstrate their ability to use organizational formats with a specific purpose; Deliver effective speeches that are consistent with and appropriate for the audience and purpose.	K_5,K_6
CO4	Develop proper listening skills; articulate and enunciate words and sentences clearly and efficiently.	K_3
CO5	Show confidence and clarity in public speaking projects; be schooled in preparation and research skills for oral presentations.	K_5

1. Group Discussion: participating in group discussions-understanding group dynamics.
2. GD strategies-activities to improve GD skills. Practical based on Accurate and Current Grammatical Patterns.
3. Interview Etiquette-dress code, body language attending job interview – Telephone/Skype interview one to one interview &Panel interview.
4. Communication Skills for Seminars/Conferences/Workshops with emphasis on Paralinguistic/ Kinesics, practicing word stress, rhythm in sentences, weak forms, intonation.
5. Oral Presentation Skills for Technical Paper/Project Reports/ Professional Reports based on proper Stress and Intonation Mechanics voice modulation, Audience Awareness, Presentation plan visual aids.
6. Speaking: Fluency & Accuracy in speech- positive thinking, Improving Self-expression developing persuasive speaking skills, pronunciation practice (foraccept neutralization) particularly of problem sounds, in isolated words as well as sentences.
7. Individual Speech Delivery/Conferences with skills to defend Interjections/Quizzes.
8. Argumentative Skills/Role Play Presentation with Stress and Intonation.
9. Comprehension Skills based on Reading and Listening Practical's on a model Audio- Visual Usage.

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NMC106:CYBERSECURITY		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course, the student will be able to		
CO1	Identify and analyze nature & inherent difficulties in the security of the Information System.	K_3
CO2	Analyze various threats and attacks, corresponding counter measures And various vulnerability assessment and security techniques in an organization.	K_3
CO3	Applications of cyber based policies and use of IPR and patent law for software-based design. Define E-commerce types and threats to E-commerce.	K_1,K_2
CO4	Explain concepts and theories of networking and apply them to various situations, classifying networks, analyzing performance.	K_2
DETAILEDSYLLABUS		**2-0-0**
Unit	**Topic**	**Proposed Lecture**
I	**Introduction-** Introduction to Information Systems, Types of Information Systems, Development of Information Systems, Introduction to Information Security and CIA triad, Need for Information Security, Threats to Information Systems, Information Assurance and Security Risk Analysis, Cyber Security.	**08**
II	**Application Security**-(Database, E-mail and Internet), Data Security Considerations (Backups, Archival Storage and Disposal of Data), Security Technology (Firewall, VPNs, Intrusion Detection System), Access Control. Security Threats -Viruses, Worms, Trojan Horse, Bombs, Trapdoors, Spoofs, E-mail Viruses, Macro Viruses, Malicious Software, Network and Denial of Services Attack.	**08**
III	**Introduction to E-Commerce-** Threats to E-Commerce, Electronic Payment System, e-Cash, Credit/Debit Cards. Digital Signature, Cryptography Developing Secure Information Systems, Application Development Security, Information Security Governance & Risk Management, Security Architecture & Design Security Issues in Hardware, Data Storage & Downloadable Devices, Physical Security of IT Assets - Access Control, CCTV, Backup Security Measures.	**08**
IV	**Security Policies-** Why policies should be developed, Policy Review Process, Publication and Notification Requirement of policies, Types of policies – WWW policies, Email Security policies, Corporate Policies, Sample Security Policies. **Case Study**–Corporate Security	**08**
V	**Information Security Standards**-ISO, IT Act, Copyright Act, IPR. Cyber Crimes, Cyber Laws in India; ITAct2000Provisions, Intellectual Property Law, Copy Right Law, Semiconductor Law and Patent Law, Software Piracy and Software License.	**08**

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Suggested Readings:

1. PfleegerC.P.andPfleegerS.L.,"AnalyzingComputerSecurity",PearsonEducationIndia.
2. PachghareV.K.,"CryptographyandinformationSecurity",PHILearningPrivateLimited.
3. GoyalK.K.andGargA."CyberSecurity",UniversitySciencePress.
4. WhitmanM.E.andMattordH.J,"PrincipleofInformationSecurity"Cengage.
5. Chapple M. and SeidlD., "Cyberwarfare:Informationoperationsina connected world"Jones & Bartlett Learning.
6. GoyalK.K.,GargA.andSinghalS.,"CyberSecurity&DataPrivacy",HPHamilton.
7. SchouC.D.andShoemakerD.P.,"InformationAssurancefortheEnterprise",TataMcGrawHill.

Syllabus

MCA 1st Year
IIndSemester

MCA (MASTEROFCOMPUTERAPPLICATIONS) FIRST YEAR SYLLABUS

SEMESTER-II

NMC201:WEBTECHNOLOGY		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course, the student will be able to:		
CO1	Apply the knowledge of HTML and CSS to develop web application and analyze the insights of internet programming to implement complete application over the web.	K3, K6
CO2	Understand, analyze and apply the role of Java Script in the workings of the web and web applications.	K2, K3
CO3	Understand, analyze and build dynamic web applications using servlet and JSP.	K_2, K_3
CO4	Develop Spring-based Java applications using Java configuration, XML configuration, annotation-based configuration, beans and their scopes, and properties.	K2,K4,K6
CO5	Develop web application using Spring Boot and REST ful Web Services	K_3, K_6
DETAILEDSYLLABUS		**3-1-0**
Unit	**Topic**	**Proposed Lecture**
I	**Web Page Designing:** Introduction and Web Development Strategies, History of Web and Internet, Protocols Governing Web, HTML-Introduction, HTML Tags, HTML-Grouping Using Div & Span, HTML-Lists, HTML-Images, HTML- Hyperlink, HTML-Table, HTML-I frame, HTML-Form, Introduction of CSS, CSS Syntax, External Style Sheet using < link >, Multiple Style Sheets, Value Lengths and Percentages, CSS-Selectors, CSS-Box Model, Floats, Clear, Introduction to Bootstrap.	**08**
II	**Scripting:** Introduction to JavaScript, Creating Variables in JavaScript, Creating Functions in JavaScript, UI Events, Returning Data from Functions, Working with Conditions, looping in Java Script, Block Scope Variables, Working with Objects, Creating Object using Object Literals, Manipulating DOM Elements with JavaScript	**08**
III	**Web Application development using JSP & Servlets:** Servlet Overview and Architecture, Interface Servlet and the Servlet Life Cycle, Handling HTTP get Requests, Handling HTTP post Requests, Redirecting Requests to Other Resources, Session Tracking, Cookies, Session Tracking with Http Session. Java Server Pages (JSP):Introduction, Java Server Pages Overview, A First Java Server Page Example, Implicit Objects, Scripting, Standard Actions, Directives, Custom Tag Libraries.	**08**

IV	**Spring:** Spring Core Basics-Spring Dependency Injection concepts, Introduction to Design patterns, Factory Design Pattern, Strategy Design pattern, Spring Inversion of Control, AOP, Bean Scopes-Singleton, Prototype, Request, Session, Application, Web Socket, Auto wiring, Annotations, Life Cycle Callbacks, Bean Configuration styles	08
V	**Spring Boot:** Spring Boot-Spring Boot Configuration, Spring Boot Annotations, Spring Boot Actuator, Spring Boot Build Systems, Spring Boot Code Structure, Spring Boot Runners, Logger, BUILDINGRESTFULWEBSERVICES, Rest Controller, Request Mapping, Request Body, Path Variable, Request Parameter, GET, POST, PUT, DELETE APIs, Build Web Applications	08

Suggested Readings:

1. BurdmanJ.,"CollaborativeWebDevelopment–StrategiesandBestpracticesforWebTeams", Addison-Wesley.
2. XavierC,"WebTechnology&Design",NewAgeinternationalPublishers.
3. Bayrossl.,"WebTechnologies",BPBPublications.
4. SchieldthH.,"TheCompleteReference–HTML&CSS",McGrawHill.
5. BergstenH.,"JavaServerPages",SPDO'Reilly.
6. WallsC.,"SpringBootinAction",ManningPublications.
7. BakliwalS.,"Hands-onApplicationDevelopmentusingSpringBoot",BPBPublications.

NMC202:OBJECTORIENTEDPROGRAMMING		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course, the student will be able to		
CO1	List the significance and key features of object-oriented programming and modeling using UML	K_4
CO2	Construct basic structural, behavioral and architectural models using object oriented software engineering approach.	K_6
CO3	Integrate object-oriented modeling techniques to reanalysis and design of A system.	K4,K5
CO4	Use the basic features of data abstraction and encapsulation in C++ programs.	K_4
CO5	Use the advanced features such as Inheritance, polymorphism and virtual function in C++ programs.	K_3,K_4
DETAILEDSYLLABUS		**3-1-0**
Unit	**Topic**	**Proposed Lecture**
I	**Introduction:** Object Oriented Programming: objects, classes, Abstraction, Encapsulation, Inheritance, Polymorphism, OOP in Java, Characteristics of Java, The Java Environment, Java Source File Structure, and Compilation. Fundamental Programming Structures in Java: Defining classes in Java, constructors, methods, access specifies, static members, Comments, Data Types, Variables, Operators, Control Flow, Arrays.	**08**
II	**Inheritance, Interfaces, and Packages:** Inheritance: Super classes, sub classes, Protected members, constructors in sub classes, Object class, abstract classes and methods. Interfaces: defining an interface, implementing interface, differences between classes and interfaces and extending interfaces, Object cloning, inner classes. Packages: Defining Package, CLASSPATH Setting for Packages, Making JAR Files for Library Packages, Important Static Import Naming Convention For Packages, Networking java.net package.	**08**
III	**Exception Handling, I/O**: Exceptions: exception hierarchy, throwing and catching exceptions, built-in exceptions, creating own exceptions, Stack Trace Elements. Input / Output Basics: Byte streams and Character streams, Reading and Writing, Console Reading and Writing Files.	**08**
IV	**Multithreading and Generic Programming:** Differences between multi-threading and multitasking, thread life cycle, creating threads, synchronizing threads, Inter-thread communication, daemon threads, thread groups. Generic Programming: Generic classes, generic methods, Bounded Types: Restrictions and Limitations.	**08**
V	**Event Driven Programming:** Graphics programming: Frame, Components, working with 2Dshapes, Using colors, fonts, and images. Basics of event handling: event handlers, adapter classes, actions, mouse events, AWT event hierarchy. Introduction to Swing: layout management, Swing Components: Text Fields, Text Areas, Buttons, Check Boxes, Radio Buttons, Lists, choices, Scrollbars, Windows Menus and Dialog Boxes.	**08**

Suggested Readings:

1. SchildtH.,"Java-ThecompleteReference",McGrawHillEducation.
2. HorstmannC.S.andCornellG.,"CoreJavaVolumeIFundamentals",PrenticeHall.
3. HolznerS.,"Java-BlackBook",Dreamtech.
4. BalagurusamyE.,"ProgramminginJava",TataMcGrawHill.
5. MughalK.,"AProgrammer'sGuidetoJavaSE8OracleCertifiedAssociate(OCA)",Addison-Wesley.