National PG College, Lucknow – 226001
(An Autonomous College of University of Lucknow)
www.npgc.in ; dduskills@npgc.in

CURRICULUM
&
PROGRAM STRUCTURE

Program Name: M.Voc. Software and e-Governance

Purpose of Program-To Build their career in software industry, academia, research, entrepreneurial pursuit, government, consulting firms and other Information Technology enabled services. To provide flexibility to the students by means of pre-defined entry and multiple exit points. To provide judicious mix of skills relating to a profession and appropriate content of General Education.

Program Outcomes

(As per Bloom's Taxonomy)

PO1 - Apply knowledge of Computing fundamentals, Computing specialization, Mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.
PO2 – Identify, formulate, research literature, and solve complex Computing problems reaching substantiated conclusions using fundamental principles of Mathematics, Computing sciences, and relevant domain disciplines.
PO3 – Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
PO4 – Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
PO5 – Demonstrate knowledge and understanding of computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO6 – Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

National PG College, Lucknow – 226001
(An Autonomous College of University of Lucknow)
www.npgc.in ; dduskills@npgc.in

Program Name: M.Voc. Software and e-Governance
Semester I

General / Skill	Paper No	Name of the Paper	Hours per Week			Credits	Evaluation Scheme				Total
			L	P	T		Internal Assessment			External Assessment	
							Class Test	Assignment & Presentation	Class Participation & Attendance		
Gen	101	Computer Based Numerical Methods	3	-	1	4	20	10	10	60	100
Skill	102	Advance Database Management System	3	-	1	4	20	10	10	60	100
Skill	103	Advance Operating Concepts with LINUX	3	-	1	4	20	10	10	60	100
Skill	104	Computer Graphics	3	-	1	4	20	10	10	60	100
Gen	105	Computer and Information Security	3	-	1	4	20	10	10	60	100
Skill	106	Mini Project Using CG & SQL		4		4	20	10	10	60	100
		TOTAL CREDITS				**24**	**TOTAL MARKS**				**600**

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: M.Voc. Software and e-Governance

Semester I

Paper Code	**101**	**L**	**T**	**P**	**C**
Paper Name	**Computer Based Numerical Methods**	**3**	**1**	**0**	**4**
Learning Objective	• To explore complex systems, physicists, engineers, financiers and mathematicians require computational methods since mathematical models are only rarely solvable algebraically. • Numerical methods, based upon sound computational mathematics, are the basic algorithms underpinning computer predictions in modern systems science.				
Course Outcomes	• CO1011 - Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems. • CO1012 - Apply numerical methods to obtain approximate solutions to mathematical problems. • CO1013 - Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations. • CO1014 – Analyze and evaluate the accuracy of common numerical methods.				

UNIT –I **(10 hours)**

Numerical system and error and types of error, Floating point Arithmetic, Source of error, Zeros of transcendental equations and polynomials, system of nonlinear equation, Solution of Algebraic and transcendental function- Bisection Method , Iteration Method, Method of false position, Newton Raphson method, Generalized Newton's method .

UNIT –II **(10 hours)**

Solution of system of linear equation, Gaussian elimination method, Gauss Jordon method, Pivoting, Iterative methods of Jacobi and Gauss Seidel Methods, Matrix Inversion Method, Method of Factorization .

UNIT –III **(10 hours)**

Interpolation, Errors in Polynomial Interpolation, Finite Differences, Forward differences, Backward Differences, Central Differences, Newton's formula for interpolation, Guass's central difference formula, Stirling's Formula, Bessel's formula, Lagrange's Interpolation Formula, Error in Lagrange's Interpolation Formula .

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW

UNIT –IV **(10 hours)**

Numerical differentiation, Error in Numerical differentiation, Cubic Spline method, Numerical Integration: Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule, Romberg's Interpolation, Numerical solutions of ordinary differential equations: Solution by Taylor's series, Euler's Method, Runge-kutta Methods.

Total Lectures: 40

Reference Books:

- Rajaraman V., **"ComputerOriented Numerical Methods"**, PHI, 2019
- Gerald & Wheatley, "**Applied Numerical Analyses**", AW
- Jain, Iyengar& Jain, "**Numerical Methods for Scientific & Engineering Computations**", New Age Int.
- Grewal B. S., **"Numerical methods in Engineering and Science"**, Khanna Publishers, Delhi

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	1	1	2	2
CO2	2	0	1	1	2	3
CO3	2	0	1	1	3	2
CO4	2	0	1	1	3	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: M.Voc. Software and e-Governance
Semester I

Paper Code	**102**	**L**	**T**	**P**	**C**
Paper Name	**Advance Database Management System**	**3**	**1**	**0**	**4**
Learning Objective	• To provide a strong foundation in advanced database concepts from an industry perspective. • To covers advanced data modeling concepts like OOD Modeling and ORD Modeling • To learn query processing and transaction management concepts for object-relational database and distributed database.				
Course Outcomes	• CO1021 - Identify advance database concepts and database models. • CO1022 - Apply and analyze various terms related to transaction management in centralized and distributed database. • CO1023 - Produce data modeling and database development process for object –oriented DBMS. • CO1024 – Analyze and Implement the concept of object- relational database in development of various real time software. Examine the issues related to multimedia and mobile database performance.				

UNIT I **(10 hours)**

Introduction to database management system, Database System and File System, Concepts and architecture, Schema and instances, Data definitions language, DML.

Concepts of ER model, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree.

UNIT II **(10 hours)**

Relational data model concepts, entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, and tuple and domain calculus.

Introduction to SQL: Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators and their procedure, Tables, views and indexes, Queries and sub queries, Aggregate functions, Insert, update and delete operations, Joins, Unions, Intersection, Minus, Cursors in SQL, PL/SQL, Triggers and clusters.

UNIT III **(10 hours)**

Functional dependencies, normal forms, BCNF, inclusion dependencies, loss less join decompositions, normalization using FD, MVD, and JDs.Transaction system, Testing of

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling.

UNIT IV **(10 hours)**

Concurrency control, locking Techniques for concurrency control, Time stamping protocols, validation based protocol, multiple granularity, Multi-version schemes, Recovery with concurrent transaction. Transaction Processing in Distributed system, data fragmentation. Replication and allocation techniques for distributed system,

Total Lectures: 40

Reference Books:

- Silberschatz, Korth and Sudershan, **"Database System Concept"**, Mc Graw Hill
- Ramakrishna and Gehrke, **"Database Management System",** Mc Graw Hill
- Garcia-Molina, Ullman,Widom, **"Database System Implementation"**, Pearson Education

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	1	1	2	2
CO2	2	0	2	2	2	3
CO3	2	0	1	1	3	2
CO4	2	1	2	1	3	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: M.Voc. Software and e-Governance
Semester I

Paper Code	103	L	T	P	C
Paper Name	Advance Operating Concepts	3	1	0	4
Learning Objective	• Teach Basics of Advance Operating System • Teach ownership and permissions of the files and directories. • Explain why these issues exist. • How to set permissions files/directories • How to manipulate files/directories.				
Course Outcomes	• CO1031 - Clearly differentiate the issues that arise in designing real-time systems; analyses a variety of real-time scheduling techniques, • CO1032- Understand prove correctness of the resulting schedule; implement basic scheduling algorithms. • CO1033 - understand how to apply real-time scheduling theory to the design and implementation of a real-world system using the POSIX real-time extensions, • CO1034- and be able to demonstrate how to manage resource access in such a system.				

UNIT –I **(10 hours)**

Introduction to OS: Application scenarios, software layers, organization of a computer system, processor, memory, input and output, issues in resource management, kernel and shell of an operating system, processes and file. File Systems and Management: user view of files, file types and file operations, file types in Unix &Microsoft, file operation commands, file access rights, file storage management, FAT, file control blocks, root file system, directory and file paths, blocks, impact of block size selection, contiguous allocation, chained & indexed allocations, Impact of allocation policy on fragmentation, mapping file blocks on the disk platter, cylinder, disk access control& scheduling ,**Introduction to Linux:** Linux distributions. Linux installation, concepts for Open source Technologies, Open source architecture.

UNIT -II **(10 hours)**

Input Output Management: device centric and computer centric IO management, input output modes, programmed IO, polling, interrupt mode of IO, various types of interrupts, interrupt servicing, priority interrupts, interrupt vectors, DMA, device drivers, interrupt handling using device drivers, buffer management, device scheduling, disk scheduling algorithms and policies.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Unit –III **(10 hours)**

Resource Sharing & Management: Shared resources, resource allocation and scheduling, resource graph models, deadlocks, mutual exclusion, semaphores, wait and signal procedures. Interprocess communication, need for communication between processes, modes of communication, pipes, shared files, shared memory, message based IPC, signals as IPC.

Lectures: 7

UNIT –IV **(10 hours)**

Real time Systems: Characteristics of RTOS, classification of real-time systems, architectures of real-time systems, scheduling in RTOS.OS and Security: Security breaches, types of attacks, attack prevention methods, security policy and access control.

Total Lectures: 40

Reference Books:

- Silbersachatz and Galvin, "**Operating System Concepts**", Pearson, 5th Ed., 2001
- Madnick E., Donovan J., "**Operating Systems**", Tata McGraw Hill, 2001
- Tannenbaum, "**Operating Systems**", PHI, 4th Edition, 2000

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	2	1	2	2
CO2	2	0	1	2	2	3
CO3	2	0	1	1	3	2
CO4	2	0	2	2	3	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: M.Voc. Software and e-Governance
Semester I

Paper Code	**104**	**L**	**T**	**P**	**C**
Paper Name	**Computer Graphics**	**3**	**1**	**0**	**4**
Learning Objective	• The course introduces the basic concepts of computer graphics. • It provides the necessary theoretical background and demonstrates the application of computer science to graphics. • The course further allows students to develop programming skills in computer graphics through programming assignments.				
Course Outcomes	• CO1041 - Understand the basic objectives and scope of computer graphics. Identify computer graphics applications common graphics APIs. • CO1042 - Understand the basic structures of 2D and 3D graphics systems. Apply the roles of Java language and the Java 2D and Java 3D packages • CO1043- Identify fields related to computer graphics. Understand the architecture and operations of a 2D graphics system. • CO1044-Describe 2D coordinate systems and equations of graphs. Apply Java 2D program structure and the Graphics2D object				

UNIT –I **(10 hours)**

Application of computer graphics, graphics devices- LED,LCD,drawing geometry, Line drawing Algorithms: DDA and Bresenham, Functions implementation, Cathode Ray Tube implementation. Random scan displays, Raster scan displays.

UNIT –II **(10 hours)**

2D transformation: Translation, Rotation, Scaling, Reflection, Shearing. Matrix representations
Circle Drawing: Bresenham and Mid-point sub division function implementation, Clipping: End Point Codes, Cohen Sutherland, Midpoint Subdivision Algorithm, Mapping, dragging,echoing, Polygon filling, character generation

UNIT –III **(10 hours)**

3D graphics transformation-translation,rotation, scaling, reflection, shearing,
Projection:parallel, Prespective projection, Hidden surface, removal algorithm method, back face removal algorithm,Z Buffer Algorithm, Scan line methods.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Unit –IV **(10 hours)**

Curves and Surfaces: Quadric surfaces, Spheres, Ellipsoid, Blooy objects, Introductory concept Of Spline, Bspline and Bezier curves and surfaces. Warm model, Colour consideration.

Total Lectures:40

Reference Books:

- Rogers, "**Mathematical Elements of Computer Graphics",** TMH
- Rogers, "**Procedural Elements of Computer Graphics",** TMH
- Hearn M. Baker, **"ComputerGraphics",** Pearson Education.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	1	2	2	2
CO2	2	0	2	1	2	3
CO3	2	0	1	1	3	2
CO4	2	1	2	2	3	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: M.Voc. Software and e-Governance
Semester I

Paper Code	105	L	T	P	C
Paper Name	**Computer and Information Security**	3	1	0	4
Learning Objective	• To become able to explain various Information security threat and controls for it. • To become able to analyze a security incidents and design countermeasures. • To become able to explain information security incident response.				
Course Outcomes	• CO1051 - Analyze and resolve security issues in networks and computer systems to secure an IT infrastructure. • CO1052 - Design, develop, test and evaluate secure software • CO1053- Develop policies and procedures to manage enterprise security risks. • CO1054- Evaluate and communicate the human role in security systems with an emphasis on ethics, social engineering vulnerabilities and training. Interpret and forensically investigate security incidents.				

UNIT I **(10 hours)**

Introduction to Computer Security: Definition, Threats to security, Government requirements, Information Protection and Access Controls, Computer security efforts, Standards, Computer Security mandates and legislation, Privacy considerations, International security activity.

UNIT II **(10 hours)**

Secure System Planning and administration, Introduction to the orange book, Security policy requirements, accountability, assurance and documentation requirements, Network Security, The Red book and Government network evaluations.

UNIT III **(10 hours)**

Information security policies and procedures: Corporate policies- Tier 1, Tier 2 and Tier3 policies - process management-planning and preparation-developing policies-asset classification policy-developing standards.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

UNIT IV **(10 hours)**

Information security: fundamentals-Employee responsibilities- information classification Information handling- Tools of information security- Information processing-secure program administration. Organizational and Human Security: Adoption of Information Security Management Standards, Human Factors in Security- Role of information security professionals.

Total Lectures: 40

ReferenceBooks:

- Debby Russell and Sr. G.TGangemi, **"Computer Security Basics (Paperback)",** 2nd Edition, O' Reilly Media, 2006.
- Thomas R Peltier, Justin Peltier and John blackley, **"Information Security Fundamentals"**, 2nd Edition, Prentice Hall, 1996

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	2	1	2	2
CO2	2	0	1	2	2	3
CO3	2	0	2	1	3	2
CO4	2	0	1	2	2	2

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: M.Voc. Software and e-Governance
Semester I

Paper Code	106	L	T	P	C
Paper Name	Mini Project Using CG & SQL	0	0	4	4
Learning Objective	• It provides the necessary theoretical background and demonstrates the application of computer science to graphics. • To learn query processing and transaction management concepts for object-relational database and distributed database.				
Course Outcomes	• CO1061 - Understand the basic objectives and scope of computer graphics. Identify computer graphics applications common graphics APIs. • CO1062 - Understand the basic structures of 2D and 3D graphics systems. Apply the roles of Java language and the Java 2D and Java 3D packages • CO1063- Produce data modeling and database development process for object –oriented DBMS. • CO1064- Analyze and Implement the concept of object- relational database in development of various real time software.				

Write programs in C /C++

- To implement the program of DDA and Bresenham Algorithm. .
- To implement the program of Mid Point Sub division Algorithm.
- To implement the program of Circle and House, Triangle, Cube.
- To implement floating point arithmetic operations i.e., addition, subtraction, multiplication and division.
- To deduce errors involved in polynomial interpolation.

  Algebraic and trancedental equations using Bisection, Newton Raphson, Iterative, method of false position, rate of conversions of roots in tabular form for each of these methods.
- To implement formulae by Bessels, Newton, Stirling, Langranges etc.
- To implement method of least square curve fitting.
- Implement numerical differentiation.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

The programming using SQL

- Create Table, SQL for Insertion, Deletion, Update and Retrival using aggregating functions.
- Write Programs in PL/SQL, Understanding the concept of Cursors.
- Write Program for Join, Union & intersection etc.
- Creating Views, Writing Assertions, Triggers.
- Creating Forms, Reports etc.
- Writing codes for generating read and update operator in a transaction using different situations.
- Implement of 2PL concerning central algorithm.
- Developing code for understanding of distributed transaction processing.
- Students are advised to use Developer 2000 Oracle 8+ version for above experiments.
- However, depending on the availability of Software's students may use power builder/SQL Server/DB2 etc. for implementation

Mini Project Based On CG & SQL

Develop a Mini project using the concepts of CG and SQL.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	1	2	2	2
CO2	2	2	1	1	2	3
CO3	2	0	1	2	1	2
CO4	2	1	1	1	2	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

National PG College, Lucknow – 226001
(An Autonomous College of University of Lucknow)
www.npgc.in ; dduskills@npgc.in

Program Name: Software and e-Governance
Semester II

General / Skill	Paper No	Name of the Paper	Hours per Week			Credits	Evaluation Scheme				Total
			L	P	T		Internal Assessment			External Assessment	
							Class Test	Assignment & Presentation	Class Participation & Attendance		
Gen	201	Advanced Computer Networks	3	-	1	4	20	10	10	60	100
Skill	202	Advance Computer Architecture	3	-	1	4	20	10	10	60	100
Skill	203	Advance Web Designing	3	-	1	4	20	10	10	60	100
Skill	204	Introduction to Mobile OS	3	-	1	4	20	10	10	60	100
Gen	205	Artificial Intelligence	3	-	1	4	20	10	10	60	100
Skill	206	Mini Project Using Advance Web Designing		4		4	20	10	10	60	100
		TOTAL CREDITS				**24**	**TOTAL MARKS**				**600**

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester II

Paper Code	201	L	T	P	C
Paper Name	**Advanced Computer Networks**	3	1	0	4
Learning Objective	• To develop an understanding of computer networking basics. • To develop an understanding of different components of computer networks, various protocols, modern technologies and their applications.				
Course Outcomes	• CO2011 - Recognize the technological trends of Computer Networking. • CO2012 - Discuss the key technological components of the Network. • CO2013- Evaluate the challenges in building networks and solutions to those. • CO2014-Describe various practical concept in Networking.				

UNIT –I **(10 hours)**

Introduction: Overview of computer network, OSI model, TCP/IP, Mac protocols for high-speed LANS, MANs & WIRELESS LANs. Fast access technologies.

UNIT –II **(10 hours)**

IPv6: Basic protocol, extension & option, support for QoS, security, neighbor discovery, auto-configuration, routing. Change to other protocols. Application programming interface for IPv6. 6bone.

UNIT –III **(10 hours)**

Mobility in network, Mobile Security, IP Multicasting, Multicasting routing protocols, address assignments, session discovery. TCP extensions for high-speed networks, transaction-oriented application, other new option in TCP.

UNIT –IV **(10 hours)**

Network security at various layers, Secure-HTTP, SSL, ESP, Authentication header, Key distribution protocols. Digital signatures, digital certificates.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P.G. College
LUCKNOW.

Reference Books:

- W. R. Stevens, "**TCP/IP illustrated, Volume 1: The protocols**", Addison Wesley 1994.
- G. R. Wright. "**TCP/IP illustrated, Volume 2: The implementation**", Addison Wesley 1995

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	1	1	2	2
CO2	2	1	1	1	2	2
CO3	2	0	1	1	2	2
CO4	2	1	1	1	3	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester II

Paper Code	202	L	T	P	C
Paper Name	**Advanced Computer Architecture**	3	1	0	4
Learning Objective	• An understanding of the fundamental computer architectural issues and the inherent limitations of the traditional approaches. • Familiarity with the principles and the terminologies involved in computer architecture, organization and design. • Introduction to methods of specification, description, measurement and evaluation of processors and systems.				
Course Outcomes	• CO2021 - Understand the cost, performance, Trends in Technology, power in Integrated Circuits and Principles of computer design. • CO2022 - Analyze the working of pipelining, exploring instruction level parallelism using static, dynamic & advanced techniques of scheduling. • CO2023- Analyze multiprocessors & thread level parallelism using shared, distributed and directory based memory models. • CO2024- Analyze multiprocessors & thread level parallelism using shared, distributed and directory based memory models				

UNIT –I **(10 hours)**

Introduction to parallel computing, Parallelism in Uniprocessor Systems, Parallel computer structures, Architectural Classification schemes, parallel processing applications.
Pipelining Processing: An overlapped parallelism, Instruction and Arithmetic pipeline.

UNIT –II **(10 hours)**

Principles of designing pipelined processors, Internal forwarding and register tagging, Hazard detection and resolution, Job sequencing and collision prevention, Characteristics of Vector processing, Multiple vector task dispatching, SIMD array processors, Masking and Data routing

UNIT –III **(10 hours)**

SIMD Interconnection network: Static, Dynamic networks, Cube interconnection network, Shuffle exchange and Omega Network, SIMD matrix multiplication.
Multiprocessor Architecture: Tightly and loosely coupled multiprocessors.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

UNIT –IV **(10 hours)**

Multiprocessor scheduling strategies and deterministic scheduling models, Introduction to Data Flow computing and data flow Graph. Introduction to 8 Bit and 16 Bit Intel Microprocessor Architecture and Register set.

Reference Books:

- Hwang and Briggs, "**Computer Architecture and parallel processing**", McGraw Hill
- R.S. Goankar, "**Microprocessor architecture, programming and application with the 8085**", Pen Ram International.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	1	1	2	2
CO2	2	1	2	1	2	3
CO3	2	0	1	1	3	2
CO4	2	1	2	1	3	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester II

Paper Code	203	L	T	P	C
Paper Name	**Advance Web Designing**	3	1	0	4
Learning Objective	• Understand the principles of creating an effective web page, including an in-depth consideration of information architecture. • Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice. • Develop skills in analyzing the usability of a web site.				
Course Outcomes	• C2031 - Understand how to plan and conduct user research related to web usability. • CO2032 Learn the language of the web: HTML and CSS. • CO2033- Identify fields related to computer graphics. Understand the architecture and operations of a 2D graphics system. • CO2034-Describe 2D coordinate systems and equations of graphs. Apply Java 2D program structure and the Graphics2D object				

UNIT –I **(10 hours)**

Introduction: Web, Protocols, Development Strategies, Web Applications, Web Project, Web Team, cyber laws.

UNIT –II **(10 hours)**

Web Page Designing: HTML: list, table, images, frames, forms, CSS, **XML:** DTD, XML schemes, presenting and using XML

UNIT –III **(10 hours)**

JavaScript: Introduction, Documents, Forms, Statements, Functions, Objects; Event and Event Handling; Introduction to AJAX, VB Script

UNIT –IV **(10 hours)**

Server Site Programming: Java Server Pages (JSP), JSP application design, tomcat server, JSP objects, declaring Variables and methods, debugging, and sharing data between JSP pages, Session, Application: data base action, development of java beans in JSP,Introduction to COM/DCOM.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Reference Books:

- Xavier, C, " **Web Technology and Design**" , New Age International
- Ivan Bayross," **HTML, DHTML, Java Script, Perl & CGI**", BPB Publication.
- Ramesh Bangia, "**Internet and Web Design**" , New Age International
- Bhave, "**Programming with Java**", Pearson Education
- Deitel, "**Java for programmers**", Pearson Education

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	2	1	2	2
CO2	2	1	1	1	2	3
CO3	2	0	1	2	2	2
CO4	2	2	2	1	3	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester II **L T P C**

Paper Code	204	L	T	P	C
Paper Name	**Introduction To Mobile OS**	3	1	0	4
Learning Objective	• The course introduces the basic concepts of Mobile OS. • It provides the necessary theoretical background and demonstrates the application of computer science to Mobile OS. • Understand the basic concepts of mobile computing. • Mobility: Provides the capability to change location while communicating to invoke computing services at some remote computers.				
Course Outcomes	• CO2041 - Compare the similarities, differences and benefits of the current mobile operating systems. • CO2042- Explain the functionalities of remote operations and security essential of mobile devices. • CO2043- Analyze the latest trends in building Mobile OS • CO2044- Demonstrate the native applications required to build using mobile OS				

UNIT –I **(10 hours)**

Introduction: characteristics, basic concepts &systems issues in mobile, pervasive computing, architecture and protocols in pervasive computing, applications and services, design tradeoffs associated with different mobile technologies, architectures, interfaces & business models, security, privacy and commercial viability of mobile.

UNIT –II **(10 hours)**

Windows: Operating System Objectives and Functions, The Evolution of Operating Systems, Developments Leading to Modern Operating Systems, Virtual Machines, OS Design Considerations for Multiprocessor and Multicore architectures, Microsoft Windows Overview.

UNIT –III **(10 hours)**

Android: Introduction to Android, Application Structure, Android Application Development, Emulator Android virtual Device, Android Layouts, Working with Intents, Advance in Intent, Activity Life Cycle, GUI Design, Style and Themes, Menu Designing, Selection Widgets, Multimedia, Data storage, Networking.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-Lucknow

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

UNIT –IV **(10 hours)**

IOS: iOS operating system, iOS SDK, Tools of the trade, Model-View-Controller, MVC interaction patterns, View Controllers, View Controller lifecycle, UIColor, UIFont, NSAttributedString, UIKit views and controls: UILabel, UIButton, UISlider, UISwitch, UITextField, UITextView, NSNotificationCenter, keyboard notifications

Reference Books:

- William Stallings, "**Operating System: Internals and Design Principles"**, Prentice Hall, 8th Edition, 2014.
- Maurice J. Bach, "**Design of UNIX Operating System**", PHI
- **Windows 2000**, BPB Publication, New Delhi.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	1	1	2	2
CO2	2	1	2	1	2	3
CO3	2	0	1	2	3	2
CO4	2	1	1	1	2	2

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester II

Paper Code	205	L	T	P	C
Paper Name	Artificial Intelligence	3	1	0	4
Learning Objective	• The primary objective of this course is to introduce the basic principles, techniques, and applications of Artificial Intelligence. • Emphasis will be placed on the teaching of these fundamentals, not on providing a mastery of specific software tools or programming environments. • Assigned projects promote a 'hands-on' approach for understanding, as well as a challenging avenue for exploration and creativity.				
Course Outcomes	• CO2051 - Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations. Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning. • CO2052 - Understand the basic structures of Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models. • CO2053- Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool. • CO2054- Demonstrate proficiency in applying scientific method to models of machine learning. • Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.				

UNIT –I **(10 hours)**

Introduction to Artificial Intelligence, Simulation of sophisticated & Intelligent Behavior in different area, problem solving in games, natural language, automated reasoning visual perception, heuristic algorithm versus solution guaranteed algorithms.

UNIT –II **(10 hours)**

Parsing techniques, context free and transformational grammars, transition nets, augmented transition nets, Fillmore's grammars, Shanks Conceptual Dependency, grammar free analyzers, sentence generation, and translation.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

UNIT –III **(10 hours)**

First order predicate calculus, Horn Clauses, Introduction to PROLOG, Semantic Nets Partitioned Nets, Minskey frames, Case Grammar Theory, Production Rules Knowledge Base, The Inference System, Forward & Backward Deduction.

UNIT –IV **(10 hours)**

Existing Systems (DENDRAL, MYCIN), domain exploration, Meta Knowledge, Expertise Transfer, Self Explaining System.

Introduction to pattern Recognition, Structured Description, Symbolic Description, Machine perception, Line Finding, Interception, Semantic, & Model, Object Identification, Speech Recognition.

Reference Books:

- Charnick "**Introduction to Artificial Intelligence**" Addision Wesley,1985.
- Rich & Knight, "**Artificial Intelligence**" 2008.
- Marcellous, "**Expert Systems Programming**", PHI, 1988.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	1	1	2	2
CO2	2	1	2	1	2	3
CO3	2	0	1	1	3	2
CO4	2	1	1	1	2	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester II

Paper Code	206	L	T	P	C
Paper Name	**Mini Project Using Advance Web Designing**	**0**	**0**	**4**	**4**
Learning Objective	• Understand the principles of creating an effective web page, including an in-depth consideration of information architecture. • Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice.				
Course Outcomes	• CO2061 - Understand how to plan and conduct user research related to web usability. • CO2062 - Learn the language of the web: HTML and CSS. • CO2063- Identify fields related to computer graphics. Understand the architecture and operations of a 2D graphics system. • CO2064-Describe 2D coordinate systems and equations of graphs. Apply Java 2D program structure and the Graphics2D object				

- Design **HTML** pages using common HTML commands of Text, its formatting and effects, Table design
- HTML page using **forms** and **frames** with all their options used in web pages.
- Write a piece of code in **XML** for creating DTD, which specifies set of rules
- Using **CSS** and **XSL** for formatting web pages
- **Java script** program with array, logical operations and constraints
- **VB Script** programs with its functions
- Write a piece of code in **AJAX**
- Write a piece of code in **ASP,ASP.NET**
- Install **Apache server**, JSP programming
- JSP database coding and connectivity

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Mini Project Based On Advance Web Designing

Develop a Mini project using the concepts of Advance Web Designing

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	0	1	2	2	2
CO2	2	0	1	1	2	3
CO3	2	0	1	2	1	2
CO4	3	0	1	1	1	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

National PG College, Lucknow – 226001
(An Autonomous College of University of Lucknow)
www.npgc.in ; dduskills@npgc.in

Program Name: Software and e-Governance
Semester III

General / Skill	Paper No	Name of the Paper	Hours per Week			Credits	Evaluation Scheme				Total
			L	P	T		Internal Assessment			External Assessment	
							Class Test	Assignment & Presentation	Class Participation & Attendance		
Gen	301	Data Warehousing & Data Mining	3	-	1	4	20	10	10	60	100
Skill	302	Cloud Computing With Microsoft Azure	3	-	1	4	20	10	10	60	100
Skill	303	Client Server Computing	3	-	1	4	20	10	10	60	100
Skill	304	Advanced Programming Languages: PHP, Python, MAYA	3	-	1	4	20	10	10	60	100
Gen	305	Cryptography & Network Security	3	-	1	4	20	10	10	60	100
Skill	306	Mini Project Using: PHP, Python, MAYA		4		4	20	10	10	60	100
		TOTAL CREDITS				**24**	**TOTAL MARKS**				**600**

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester III

Paper Code	301	L	T	P	C
Paper Name	**Data Warehousing & Data Mining**	3	1	0	4
Learning Objective	• To extract knowledge from data repository for data analysis, frequent pattern, classification and prediction. • Develop a data mining application for data analysis using various tools.				
Course Outcomes	• CO3011 - Understand warehousing architectures and tools for systematically organizing large database and use their data to make strategic decisions. • CO3012 - Understand KDD process for finding interesting pattern from warehouse. • CO3013- Remove redundancy and incomplete data from the dataset using data preprocessing methods. Characterize the kinds of patterns that can be discovered by association rule mining • CO3014- Discover interesting patterns from large amounts of data to analyze for predictions and classification.				

UNIT –I **(10 hours)**

Introduction: DATA Warehousing, Data-Mart, Concept of Data-Warehousing, Multi-Dimensional Database Structures, Client/Server architecture, Parallel Processors & Cluster Systems. Distributed DBMS implementations.

UNIT –II **(10 hours)**

DATA Warehousing: Components, Building a Data Warehouse, Warehouse Database, Mapping the Data Warehouse to a Multiprocessor Architecture, DBMS Schemas for Decision Support. Data Extraction, Cleanup & Transformation Tools, Metadata.

UNIT –III **(10 hours)**

Business Analysis, Reporting & Query Tools & Applications, OLAP, Patterns & Models, Statistics.

Data Mining: Introduction, Techniques of Data-Mining, Decision Trees, Neural Networks, Nearest Neighbor& Clustering, Genetic Algorithms.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

UNIT –IV **(10 hours)**

Multimedia Data-Mining, Multimedia-Databases, Mining Multimedia Data, Data-Mining and the World Wide Web, Web Data-Mining, Mining and Meta-Data

Reference Books:

- Berson, "**Data Warehousing, Data-Mining & OLAP**", TMH
- Mallach, "**Decision Support and Data Warehousing System**", TMH
- BhavaniThura-is-ingham, "**Data-Mining Technologies, Techniques Tools & Trends**", CRC Press
- Navathe, "**Fundamental of Database System**", Pearson Education
- 5.Margaret H. Dunham, "**Data-Mining. Introductory & Advanced Topics**", Pearson Education

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	1	1	2	2
CO2	2	0	2	1	2	3
CO3	2	0	1	2	3	2
CO4	2	0	1	1	2	2

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester III **L T P C**

Paper Code	302	L	T	P	C
Paper Name	**Cloud Computing With Microsoft Azure**	3	1	0	4
Learning Objective	• To extract knowledge from cloud data for data analysis, frequent pattern, classification and prediction. • Develop a cloud data application for data analysis using various tools.				
Course Outcomes	• CO3021 - Prove knowledge of cloud computing concepts. • CO3022 - Models, and services, such as public, private, and hybrid cloud, in addition to infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS). • CO3023- Show expertise on how Azure supports security, privacy, compliance, and trust. • CO3024-Describe 2D coordinate systems and equations of graphs. Apply Java 2D program structure and the Graphics2D object				

UNIT –I **(10 hours)**

Introduction to Cloud, benefits, usage scenarios, History of Cloud Computing,
Cloud Architecture, Types, Business models, issues in Clouds - Eucalyptus - Nimbus - Open Nebula.

UNIT –II **(10 hours)**

Cloud Services: Types of Cloud services, Software as a Service-Platform as a Service, Infrastructure as a Service, Database as a Service - Monitoring as a Service, Communication as services, Service providers: Google, Amazon, Microsoft Azure, IBM, Sales force.

UNIT -III **(10 hours)**

Collaborating Using Cloud Services, Email Communication over the Cloud, CRM Management, Project Management, Event Management, Task Management: Calendar, Schedules, Word Processing, Presentation, Spreadsheet, Databases, Desktop, Social Networks and Groupware.

Department of Software
Pt. Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Pt. Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

UNIT –IV **(10 hours)**

Virtualization: Need for Virtualization, Pros and cons of Virtualization, Types of Virtualization, Machine monitor, Virtual machine properties, Interpretation and binary translation, HLL VM, Hypervisors : Xen, KVM , VMWare, Virtual Box, Hyper-V, Security in Clouds

Reference Books:

- John Rittinghouse& James Ransome, "**Cloud Computing, Implementation, Managementand Strategy",** CRC Press, 2010.
- Michael Miller, "**Cloud Computing: Web-Based Applications That Change the Way You**
- **Work and Collaborate"** Que Publishing, August 2008.
- James E Smith, Ravi Nair, "**Virtual Machines"**, Morgan Kaufmann Publishers, 2006.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	1	1	2	2
CO2	1	1	2	2	2	3
CO3	2	0	1	1	2	2
CO4	3	1	2	2	3	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Deen Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester III

Paper Code	**303**	**L**	**T**	**P**	**C**
Paper Name	**Client Server Computing**	**3**	**1**	**0**	**4**
Learning Objective	• Client Server Computing Model defines the way successful organizations will use technology during the next decade. • Knowledge of client server architecture has become an essential part of computer science. • The main objective is to provide the basic concepts of client server computing and the new technologies involved in it.				
Course Outcomes	• CO3031 - Understand fundamental concepts of Web Services including: Client Server systems, system models of distributed systems, • CO3032 - Networks that distributed systems run on, communication protocols between processes in distributed systems, Middleware, Enterprise Application integration. • CO3033- Web Services Security Compile and execute actual programs using sockets, Java RMI, Java Beans, and Web Services. • CO3034-Describe the Client Server Model in real time.				

UNIT –I **(10 hours)**

Client/Server Computing: DBMS concept and architecture, Client Server architecture, mainframe-centric client server computing, preserving mainframe applications investment through porting, client server development tools, advantages of client server computing.

UNIT –II **(10 hours)**

Components of Client/Server application: The client: services, request for services, RPC, windows services, fax, print services, remote boot services, other remote services, Utility Services & Other Services, Dynamic Data Exchange (DDE), Object Linking and Embedding (OLE), Common Object Request Broker Architecture (CORBA).**The server**: Detailed server functionality, the network operating system, available platforms, the network operating system, available platform, the server operating system.

UNIT –III **(10 hours)**

Client/Server Network: connectivity, communication interface technology, Interposes communication, wide area network technologies, network topologies, network management, Client-server system development: Software, Client–Server System Hardware: Network Acquisition, PC-level processing unit, Macintosh, notebooks, pen, UNIX workstation.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

UNIT –IV **(10 hours)**

Data Storage: magnetic disk, magnetic tape, CD-ROM, WORM, Optical disk, mirrored disk, fault tolerance, RAID, RAID-Disk network interface cards. Network protection devices, Power Protection Devices, UPS, Surge protectors.

Client Server Systems Development: Services and Support, system administration, Availability, Reliability, Serviceability, Software Distribution, Performance, Network management, Help Disk, Remote Systems Management Security, LAN and Network Management issues.

Total Lectures: 40

Reference Books:

- Patrick Smith &SteaveGuengerich, "**Client / Server Computing**", PHI
- Dawna Travis Dewire, "**Client/ServerComputing**", TMH
- 3.Majumdar& Bhattacharya, "**Database management System**", TMH
- Korth, Silberchatz, Sudarshan, "**Database Concepts**", McGraw Hill

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	1	2	1	2	2
CO2	2	1	1	1	2	3
CO3	3	2	1	2	3	2
CO4	2	1	2	1	2	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester III **L T P C**

Paper Code	304	L	T	P	C
Paper Name	**Advanced Programming Languages: PHP, Python, Maya**	3	1	0	4
Learning Objective	• The purpose of the course is to study the concepts and techniques necessary to write high-quality programs, including basic concepts of object-oriented programming, modular design, exception handling, and class libraries. • Some advanced topics such as reflection, distributed programming, multi-threading, and GUI libraries are also covered.				
Course Outcomes	• CO3041 - Design, test and execute functional programs in MAYA,PHP.PYTHON • CO3042 - Use expressive types (polymorphism, type functions, higher-kinded types) to document library interfaces • CO3043- Recognize monadic structures in computation, use libraries following monadic structure and design monadic libraries • CO3044-Implement real life application using MAYA and Python.				

UNIT –I **(10 hours)**

PHP:PHP installation , Loops, String, Functions in PHP, PHP Email Function, PHP Basics, Variables, Arrays in PHP with Attributes, Date & Time, Image Uploading, File handling in PHP, Functions in PHP, Errors handling in PHP.

UNIT –II **(10 hours)**

Python: Introduction, A Brief History of Python, Python Versions, Installing Python, Environment Variables, Executing Python from the Command Line, Editing Python Files, Python Documentation, Python Reserved Words, Naming Conventions, Basic Syntax, Comments, String Values, String Methods, The format Method, String Operators, Numeric Data Types, Conversion Functions, Simple Output, Simple Input, The % Method, The print Function

UNIT –III **(10 hours)**

Maya: Explain 3Dworkspace, Understand the 3D coordinatesystem, Describe world, object, and localspaces, basics of modeling, Basic concepts of 3D animation.

The Maya Interface: Understanding Menus, Icons, Dialog Boxes, and the Maya Interface, Maya's viewport to work with Cameras.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

UNIT-IV **(10 hours)**

The importance of materials and textures,Differentiate between textures andmaterials,process of texturing inMaya, Introduction to Lighting, Surfacing, Rigging, and Animation, 12 principles of animation and outline its history andtypes.

Reference Books:

- Mark Lutz, David Ascher, "**Learning Python**", O'Reilly Media, Inc.,1999.
- Todd Palamar , "**Mastering Autodesk Maya 2015: Autodesk Official Press**".
- Elizabeth Drake, **"Introduction to JavaScript Programming with XML and PHP".**

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	1	2	2	2
CO2	3	0	1	1	2	3
CO3	2	0	2	1	2	2
CO4	3	0	1	2	3	2

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance

Semester III

L	T	P	C
3	1	0	4

Paper Code	305	L	T	P	C
Paper Name	Cryptography & Network Security	3	1	0	4
Learning Objective	• The course introduces the basic concepts of computer graphics. • Be able to perform simple vulnerability assessments and password audits · Be able to configure simple firewall architectures · • Understand Virtual Private Networks				
Course Outcomes	• CO3051 - Understand the most common type of cryptographic algorithm · • CO3052 - Be able to digitally sign emails and files · Understand vulnerability assessments and the weakness of using passwords for authentication · • CO3053- Understand the Public-Key Infrastructure · Understand security protocols for protecting data on networks • CO3054-Understand Encryption and decryption latest techniques.				

UNIT-I **(10 hours)**

Introduction to Cryptography: Introduction To Security: Attacks, Services & Mechanisms, Security, Attacks, Security Services. Conventional Encryption: Classical Techniques, Conventional Encryption Model, and Steganography, Classical Encryption Techniques. Modern Techniques: Simplified DES, Block Cipher Principles, DES Standard, DES Strength, Differential & Linear Cryptanalysis, Block Cipher Design Principles, Block Cipher Modes Of Operation.

UNIT-II **(10 hours)**

Conventional Encryption Algorithms: Triples DES, Blowfish, International Data Encryption Algorithm, RCS, CAST-128, RC2 Placement & Encryption Function, Key Distribution, Random Number Generation, Placement Of Encryption Function.

UNIT-III **(10 hours)**

Public Key Encryption: Public-Key Cryptography: Principles Of Public-Key Cryptosystems, RSA Algorithm, Key Management, Fermat's & Euler's Theorm, Primality, The Chinese Remainder Theorem.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

UNIT-IV **(10 hours)**

Hash Functions: Message Authentication & Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Birthday Attacks, Security Of Hash Function & MACS, MD5 Message Digest Algorithm, Secure Hash Algorithm (SHA), Digital Signatures: Digital Signatures, Authentication Protocol, Digital Signature Standard (DSS), Proof Of Digital Signature Algorithm.

Reference Books:

- Johannes A. Buchmann, "Introduction to cryptography", Springer- Verlag.
- AtulKahate, "Cryptography and Network Security", TMH
- 3.William Stallings, "Cryptography and Network Security: Principles and Practice", Prentice Hall, New Jersey

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	1	1	2	2
CO2	3	1	1	2	2	3
CO3	2	0	1	1	3	2
CO4	3	1	1	2	3	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance

Semester III

Paper Code	**306**	**L**	**T**	**P**	**C**
Paper Name	**PRACTICAL : ASP.NET USING C#**	**0**	**0**	**4**	**4**
Learning Objective	• All of the mentioned concepts and techniques are studied using the C# language. It is important to note that this course is PHP and all programming language. • The emphasis is on the concepts and techniques rather than the language itself.				
Course Outcomes	• CO3061 – To able develop and website on C#. • CO3062 – To able develop an different applications on C#. • CO3063- Understand about ASP and others Languages in web development. • CO3064- deliver a Market demand Product using latest programming languages.				

Mini Project Based On ASP.Net in C#

Develop a Mini project using the concepts of ASP.Net using C#.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	0	2	1	2	2
CO2	2	0	1	1	2	3
CO3	3	0	2	1	2	2
CO4	2	1	1	1	2	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

National PG College, Lucknow – 226001
(An Autonomous College of University of Lucknow)
www.npgc.in ; dduskills@npgc.in

Program Name: Software and e-Governance
Semester IV

General / Skill	Paper No	Name of the Paper	Hours per Week			Credits	Evaluation Scheme				Total
			L	P	T		Internal Assessment			External Assessment	
							Class Test	Assignment & Presentation	Class Participation & Attendance		
Gen	401	Research Methodology	3	-	1	4	20	10	10	60	100
Skill	402	e-Governance & Case Studies	3	-	1	4	20	10	10	60	100
Skill	403	Cyber Crime & Security	3	-	1	4	20	10	10	60	100
Skill	404	Industrial Training & Project	0	6	6	12	20	70	60	150	300
		TOTAL CREDITS				**24**	**TOTAL MARKS**				**600**

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester IV

Paper Code	401	L	T	P	C
Paper Name	Research Methodology	3	1	0	4
Learning Objective	• To understand a general definition of research design. • To know why educational research is undertaken, and the audiences that profit from research studies. • To be able to identify the overall process of designing a research study from its inception to its report. • To be familiar with ethical issues in educational research, including those issues that arise in using quantitative and qualitative research.				
Course Outcomes	• CO4011 – Students should know the primary characteristics of quantitative research and qualitative research. • CO4012 – Students should be able to identify a research problem stated in a study. Students should be able to distinguish a purpose statement, a research question or hypothesis, and a research objective. • CO4013- Students should be familiar with how to write a good introduction to an educational research study and the components that comprise such an introduction • CO4014- Students should be familiar with conducting a literature review for a scholarly educational study: a. The steps in the overall process. b. The types of databases often searched. c. The criteria for evaluating the quality of a study. d. The ways of organizing the material found. e. The different types of literature reviews.				

UNIT –I **(10 hours)**

Introduction: Concept of Research and Its Application, Types of Research, Problems and Precautions to the Researchers.

UNIT –II **(10 hours)**

Process of Research: Steps Involved in Research Process.

Research Design: Various Methods of Research Design, Collection of Data.

UNIT –III **(10 hours)**

Concept of Sample, Sample Size and Sampling Procedure, Various Types of Sampling Techniques, Determination and Selection of Sample Member.

Types of Data: Secondary and Primary, Various Methods of Collection and Data, Preparation of Questionnaire and Schedule, Types of Questions, Sequencing of Questions, Check Questions, Length of Questionnaire, Precautions in Preparation of Questionnaire and Collection of Data.

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

UNIT –IV **(10 hours)**

Analysis of Data: Coding, Editing and Tabulation of Data, Various Kinds of Charts and Diagrams Used in Data Analysis: Bar and Pie Diagrams and their Significance, Use of SPSS in Data Analysis, Application and Analysis of Variance (ANOVA). Measurement and Central Tendency, Measure of Dispersion and their Advantages, **ReportPreparation**: Types and Layout of Research Report, Precautions in Preparing the Research Report. **Bibliography and Annexure in the Report:** Their Significance, Drawing Conclusions, Suggestions and Recommendations to the Concerned Persons.

Reference Books:

- Kothari C R, "**Research Methodology Methods & Techniques**", New Age International Publishers, 2nd Edition, 2007.
- Cooper and Schindler, "**Business Research Methods**", Tata Mc Graw Hill, 9th Edition.
- C. Murthy,"**Research Methodology",** Vrinda Publications.
- Bhattacharyya, "**Research Methodology**", Excel Books.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	1	2	2	2
CO2	2	3	2	1	2	3
CO3	2	2	1	3	3	2
CO4	2	2	2	1	3	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

National PG College, Lucknow – 226001
(An Autonomous College of University of Lucknow)
www.npgc.in ; dduskills@npgc.in

Program Name: Software and e-Governance
Semester IV

Paper Code	402	L	T	P	C
Paper Name	E-Governance & Case Studies	3	1	0	4
Learning Objective	• Gain a familiarity with the basic concepts, terminology and technology of e-commerce/e-government. Develop skills to critically evaluate government web sites and eservices against current "best practice" principles and standards. • Understand the major federal and state laws and regulations impacting the evolution of e-government.				
Course Outcomes	• CO4021 – Understand about benefits and outcomes and vision of e governance for citizens. • CO4022 – Understand the case study concept and it relate with the e governance. • CO4023- Be able to articulate the policy and social issues facing agencies in implementing e-government initiatives. • CO4024- Be able to apply basic business case and government IT management concepts in preparing e-government proposals, plans or strategies.				

UNIT –I **(10 hours)**

Good Governance, Governance versus E-Governance, E-Governance – Introduction, Objectives, Evaluation Framework, Methodology, People Process & Technology Model,IT &E-Governance, Factors affecting E-Governance, Concept of Paperless Secretariat,Effective File Tracking System,Concept of Civic Management SolutionsPublic Grievance Redressal

UNIT –II (10 hours)

Factors affecting usage of E-governance Services, Factors affecting Quality of Services, Citizens Requirement Study, Study of Behavioural Issues, Critical findings, Components of E-Governance, Policy Initiatives, Local Governance Applications-Automation of Tax Collections, Building Plan Permissions, Birth & Death Certificates, Business Registration & Licenses, Public Health & Sanitation and Complaints for Municipal Corporations, Nagar Palikas& Panchayats.

UNIT –III **(10 hours)**

E-governance System Design- Business Process Reengineering and System, Change Management, Citizen centric e-governance System Design, E-governance Project Design, E-governance in Indian States, Comparison of policies of various states

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

UNIT –IV **(10 hours)**

Case studies of specific e-governance projects in various states of India related to Land reforms, Education, Agriculture, Employment, Public Utilities-PDS system and Connectivity with Government i.e. e-Bhoomi, Gyandoot, Janmitra etc.

Reference Books:

- D.N. Gupta, "**E-governance: A Comprehensive Framework**", New Century Publications, India, 2008
- S. Pankaj, "**Electronic Governance**", A. P. H. Publishing Corporation, India, 2004 .

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	0	1	1	2	2
CO2	2	1	2	1	2	3
CO3	2	0	1	2	3	2
CO4	3	1	2	2	3	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Deen Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester IV **L T P C**

Paper Code	**403**	**L**	**T**	**P**	**C**
Paper Name	**Cyber Crime & Security**	**3**	**1**	**0**	**4**
Learning Objective	• The Objectives Of This Course Is To Enable Learner To Understand, Explore, And Acquire A Critical Understanding Cyber Law. • Develop Competencies For Dealing With Frauds And Deceptions (Confidence Tricks, Scams) And Other Cyber Crimes For Example, Child Pornography Etc. That Are Taking Place Via The Internet.				
Course Outcomes	• CO4031 - Make Learner Conversant With The Social And Intellectual Property Issues Emerging From 'Cyberspace. • CO4032 – Explore The Legal And Policy Developments In Various Countries To Regulate Cyberspace; • CO4033- Develop The Understanding Of Relationship Between Commerce And Cyberspace; and Give Learners In Depth Knowledge Of Information Technology Act And Legal Frame Work Of Right To Privacy, Data Security And Data Protection. • CO4044- Make Study On Various Case Studies On Real Time Crimes				

UNIT –I **(10 hours)**

Introduction: Introduction and Overview of Cyber Crime, Nature and Scope of Cyber Crime, Types of Cyber Crime: Social Engineering, Categories of Cyber Crime, Property Cyber Crime.

UNIT –II **(10 hours)**

Cyber Crime Issues: Unauthorized Access to Computers, Computer Intrusions, White collar Crimes, Viruses and Malicious Code, Internet Hacking and Cracking, Virus Attacks, Pornography, Software Piracy, Intellectual Property, Mail Bombs, Exploitation ,Stalking and Obscenity in Internet, Digital laws and legislation, Law Enforcement Roles and Responses.

UNIT –III **(10 hours)**

Introduction to Cyber Forensic Investigation, Investigation Tools, eDiscovery, Digital Evidence Collection, Evidence Preservation, E-Mail Investigation, E-Mail Tracking, IP Tracking, E-Mail Recovery, Encryption and Decryption methods, Search and Seizure of Computers, Recovering deleted evidences, Password Cracking

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

UNIT –IV **(10 hours)**

Introduction to Cyber Security, Implementing Hardware Based Security, Software Based Firewalls, Security Standards, Assessing Threat Levels, Forming an Incident Response Team, Reporting Cyber crime, Operating System Attacks, Application Attacks, Reverse Engineering & Cracking Techniques and Financial Frauds

Reference Books:

- Bernadette H Schell, Clemens Martin, "**Cybercrime**", ABC – CLIO Inc, California, 2004
- Charles P. Pfleeger, Shari LawerancePfleeger, "**Analysing Computer Security**", Pearson Education India.
- V.K. Pachghare, "**Cryptography and information Security**", PHI Learning Private Limited, Delhi India.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	0	1	1	2	2
CO2	2	1	1	2	2	3
CO3	2	0	1	1	3	2
CO4	2	1	2	1	2	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Dean Dayal Upadhyay Kaushal K...
...l PG College, Lucknow.

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Program Name: Software and e-Governance
Semester IV **L T P C**

Paper Code	**404**	**L**	**T**	**P**	**C**
Paper Name	**Industrial Training & Project**	**0**	**0**	**4**	**4**
Learning Objective	• To provide comprehensive learning platform to students where they can enhance their employ ability skills and become job ready along with real corporate exposure. • To enhance students' knowledge in one particular technology. • To Increase self-confidence of students and helps in finding their own proficiency • To cultivate student's leadership ability and responsibility to perform or execute the given task.				
Course Outcomes	• CO4041 - Capability to acquire and apply fundamental principles of engineering.Become master in one's specialized technology • CO4042 - Become updated with all the latest changes in technological world.Ability to communicate efficiently • CO4043- Knack to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills.Ability to identify, formulate and model problems and find engineering solution based on a systems approach. • CO4044- Capability and enthusiasm for self-improvement through continuous professional development and life-long learning Awareness of the social, cultural, global and environmental responsibility as an engineer.				

Department of Software
Dean Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Dean Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

Principal
National P. G. College
LUCKNOW.

Guidelines & General Instruction:

- Every student is required to carry out project work under the supervision of a faculty member of the department.
- However, a student may also opt to pursue his project work in a reputed industry/institution with the consent of Department/Institute.
- In such cases, the department must look into the suitability of the projects and assign one internal guide/supervisor.
- The internal supervisor shall monitor progress of the student continuously.
- A candidate is required to present the progress of the project work (at least twice) during the semester at an appropriate time decided by the Department.
- There will a final presentation of the project work at the end of the semester.

CO-PO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	2	2	2	2
CO2	2	0	2	2	2	3
CO3	2	0	2	2	3	2
CO4	2	1	2	2	3	3

3	High Correlation
2	Moderate Correlation
1	Low Correlation
0	No Correlation

Department of Software
Deen Dayal Upadhyay Kaushal Kendra
National PG College, Lucknow-226001

Coordinator
Deen Dayal Upadhyay Kaushal Kendra
National P.G. College, Lucknow

National P. G. College
LUCKNOW.