NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR

(AN AUTONOMOUS INSTITUTE)

NIET
Greater Noida
Autonomous Institute
Estd.2001
Get Future Ready

Affiliated to

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW

Evaluation Scheme & Syllabus

For

Bachelor of Technology

Computer Science and Business Systems

Second Year

(Effective from the Session: 2024-25)

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR

(AN AUTONOMOUS INSTITUTE)

Bachelor of Technology

Computer Science and Business Systems

Evaluation Scheme

SEMESTER-III

S. No	Subject Codes	Subject	Types of Subjects	Periods			Evaluation Schemes				End Semester		Total	Credit
				L	T	P	CT	TA	TOTAL	PS	TE	PE		
3 WEEKS COMPULSORY INDUCTION PROGRAM														
1	BCSBS0306	Formal Language &Automata Theory	Mandatory	3	0	0	30	20	50		100		150	3
2	BCSBS0303	Computer Organization & Architecture	Mandatory	3	0	0	30	20	50		100		150	3
3	BCSBS0302	Object Oriented Programming	Mandatory	3	0	0	30	20	50		100		150	3
4	BCSBS0301	Computational Statistics	Mandatory	3	0	0	30	20	50		100		150	3
5	BCSBS0304	Software Engineering	Mandatory	3	0	0	30	20	50		100		150	3
6	BCSBS0305	Financial Management	Mandatory	2	0	0	30	20	50		50		100	2
7	BCSBS0353	Computer Organization & Architecture Lab	Mandatory	0	0	2				25		25	50	1
8	BCSBS0352	Object Oriented Programming Lab	Mandatory	0	0	2				25		25	50	1
9	BCSBS0351	Computational Statistics Lab	Mandatory	0	0	2				25		25	50	1
10	BCSBS0354	Software Engineering Lab	Mandatory	0	0	2				25		25	50	1
11	BNC0303	Indian Constitution	Compulsory Audit	2	0	0	30	20	50		50		100	NA
		*Massive Open Online Courses (For B.Tech. Hons. Degree)	*MOOCs											
		TOTAL											**1050**	**21**

*** List of MOOCs Based Recommended Courses for Second year (Semester-III) B. Tech Students**

S.No.	Subject Code	Course Name	University / Industry Partner Name	No of Hours	Credits
1	BMC0008	Object Oriented Programming Using Python	Infosys Wingspan (Infosys Springboard)	46h 13m	3.5
2	BMC0017	Programming Using C++	Infosys Wingspan (Infosys Springboard)	24h 18m	2

PLEASE NOTE: -

- **Compulsory Audit (CA) Courses (Non-Credit - BNC0303)**
  - All Compulsory Audit Courses (a qualifying exam) do not require any credit.
  - The total and obtained marks are not added in the grand total.

Abbreviation Used:

L: Lecture, T: Tutorial, P: Practical, CT: Class Test, TA: Teacher Assessment, PS: Practical Sessional, TE: Theory End Semester Exam., CE: Core Elective,OE:Open Elective, DE: Departmental Elective, PE: Practical End Semester Exam, CA: Compulsory Audit, MOOCs: Massive Open Online Courses.

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR

(AN AUTONOMOUS INSTITUTE)

Bachelor of Technology Computer Science and Business System

Evaluation Scheme

SEMESTER-IV

S.No.	Subject Code	Subject	Types of Subjects	Periods			Evaluation Schemes				End Semester		Total	Credit
				L	T	P	CT	TA	Total	PS	TE	PE		
1	BCSBS0403	Operating Systems	Mandatory	3	0	0	30	20	50		100		150	3
2	BCSBS0404	Database Management Systems	Mandatory	3	0	0	30	20	50		100		150	3
3	BCSBS0402	Software Design with UML	Mandatory	2	0	0	30	20	50		50		100	2
4	BCSBS0405	Introduction to Innovation, IP Management & Entrepreneurship	Mandatory	2	0	0	30	20	50		50		100	2
5	BCSBS0407	Business Communication & Value Science-III	Mandatory	2	0	0	30	20	50		50		100	2
6	BCSBS0401	Operations Research	Mandatory	2	0	0	30	20	50		50		100	2
7	BCSBS0406	Marketing Research & Marketing Management	Mandatory	2	0	0	30	20	50		50		100	2
8	BCSBS0453	Operating Systems Lab (Unix)	Mandatory	0	0	2				25		25	50	1
9	BCSBS0454	Database Management Systems Lab	Mandatory	0	0	2				25		25	50	1
10	BCSBS0452	Software Design with UML Lab	Mandatory	0	0	2				25		25	50	1
11	BCSBS0451	Operations Research Lab	Mandatory	0	0	2				25		25	50	1
12	BNC0404	Essence of Indian Traditional Knowledge	Compulsory Audit	2	0	0	30	20	50		50		100	NA
		*Massive Open Online Courses (For B.Tech. Hons. Degree)	*MOOCs											
		TOTAL											**1000**	**20**

*** List of MOOCs Based Recommended Courses for Second year (Semester-IV) B. Tech Students**

S. No.	Subject Code	Course Name	University / Industry Partner Name	No of Hours	Credits
1	BMC0010	Comprehensive Training on Unix and Linux OS Fundamentals	Infosys Wingspan (Infosys Springboard)	30h 13m	2
2	BMC0011	Building Machine Learning Systems with Tensor Flow	Infosys Wingspan (Infosys Springboard)	27h 18m	2

PLEASE NOTE: -

- **Compulsory Audit (CA) Courses (Non-Credit - BNC0404)**
  - All Compulsory Audit Courses (a qualifying exam) do not require any credit.
  - The Total and obtained marks are not added in the Grand Total.

Abbreviation Used:

L: Lecture, T: Tutorial, P: Practical, CT: Class Test, TA: Teacher Assessment, PS: Practical Sessional, TE: Theory End Semester Exam., CE: Core Elective,OE:Open Elective, DE: Departmental Elective, PE: Practical End Semester Exam, , CA: Compulsory Audit, MOOCs: Massive Open Online Courses.

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR

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A student will be eligible to get Under Graduate degree with Honours only, if he/she completes the additional MOOCs courses such as Coursera certifications, or any other online courses recommended by the Institute (Equivalent to 20 credits). During Complete B.Tech. Program Guidelines for credit calculations are as follows.

1. For 6 to 12 Hours =0.5 Credit
2. For 13 to18 =1 Credit
3. For 19 to 24 =1.5 Credit
4. For 25 to 30 =2 Credit
5. For 31 to 35 =2.5 Credit
6. For 36 to 41 =3 Credit
7. For 42 to 47 =3.5 Credit
8. For 48 and above =4 Credit

For registration to MOOCs Courses, the students shall follow Coursera registration details as per the assigned login and password by the Institute these courses may be cleared during the B. Tech degree program (as per the list provided). After successful completion of these MOOCs courses, the students shall provide their successful completion status/certificates to the Controller of Examination (COE) of the Institute through their coordinators/Mentors only.

The students shall be awarded Honours Degree as per following criterion.

i. If he / she secures 7.50 as above CGPA.

ii. Passed each subject of that degree program in the single attempt without any grace.

iii. Successful completion of MOOCs based 20 credits

NIET Greater Noida Autonomous Institute	**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY** **GREATER NOIDA-201306** **(An Autonomous Institute)** **School of Computer Science in Emerging Technologies**

Subject Name: Formal Languages and Automata Theory	**L-T-P [3-0-0]**
Subject Code: BCSBS0306	**Applicable in Department: B.TECH. (CSBS)**
Prerequisite of Subject: Basics of Digital Logic, control system, fundamental of C : Industry Requirement of Subject (mention the companies where this subject can play a role or this subject is required for the mentioned job role).	
Course Objective: To introduce mathematical foundations of computation including automata theory, provide the design concepts of abstract computation model of finite automata, push down automata and Turing Machine and familiarize the notions of algorithm, decidability, complexity, and computability.	

Course Outcome (CO)

Course Outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO 1	Simplify automata for formal languages and apply closure properties of formal language to construct finite automata for complex problems.	K1
CO2	Define grammar for context free languages and proving it equivalence with PDA.	K3
CO3	Construct Turing Machine for recursive and recursive enumerable languages.	K4
CO4	Identify the decidable and undecidable problems.	K4
CO5	Perform Polynomial time reduction and proving NP- Completeness of basic NP-hard Problem.	K4

Syllabus						
Unit No	**Module Name**	**Topic covered**	**Pedagogy**	**Lecture Required (L+P)**	**Practical/ Assignment/ Lab Nos**	**CO Mapping**
Unit 1	**Module 1:** **Module 2:** **Module 3:** **Module 4:**	Module 1: Fundamentals of Formal Languages Alphabet, Languages, and Grammars: Definition and basic concepts. Productions and Derivation: Understanding how grammars generate strings. Chomsky Hierarchy of Languages: Classification of formal languages into four types. Module 2: Regular Expressions and Languages Regular Expressions and Languages: Syntax, semantics, and relationship with regular languages. Deterministic Finite Automata (DFA): Definition and equivalence with regular expressions. Nondeterministic Finite Automata (NFA): Definition and equivalence with DFAs. Regular Grammars: Definition and equivalence with finite automata. Module 3: Properties and Theorems of Regular Languages Properties of Regular Languages: Closure properties and decision problems. Kleene's Theorem: Statement and significance in formal language theory. Pumping Lemma for Regular Languages: Basic tool for proving languages are not regular. Myhill-Nerode Theorem: Characterization of regular languages and its applications. Module 4: Automata and Minimization Minimization of Finite Automata: Techniques for minimizing the number of states in a DFA.	Smart Board	8L	Assignment based on Regular Languages and Finite Automata	CO1
Unit 2	**Module 1:**	Module 1: Context-Free Grammars and Languages Context-Free Grammars (CFG) and Languages (CFL): Definitions and examples.	Smart Board	8L	Assignment based on	CO2

	Module 2: **Module 3:** **Module 4:**	Chomsky and Greibach Normal Forms: Standard forms for CFGs. Equivalence with CFG: Understanding the relationship between CFGs and the languages they generate. Parse Trees: Representation of derivations in CFGs using trees. Module 2: Ambiguity and Properties of CFLs Ambiguity in CFG: Understanding and resolving ambiguity issues in context-free grammars. Pumping Lemma for Context-Free Languages: A tool for proving certain languages are not context-free. Closure Properties of CFLs: Operations that preserve context-freeness. Module 3: Pushdown Automata and Equivalence Deterministic Pushdown Automata (DPDA): Definition and properties. Nondeterministic Pushdown Automata (PDA): Definition and equivalence with DPDA. Linear Bounded Automata (LBA): Definition and equivalence with context-sensitive grammars. Module 4: Advanced Concepts and Applications Advanced Topics in CFLs and CSGs: Further exploration of properties and behaviors. Applications of Context-Free and Context-Sensitive Languages: Real-world applications in various domains. Comparison with Regular Languages: Contrasting CFLs and CSGs with regular languages in terms of expressiveness and complexity.			Context Free Grammar	
Unit 3	**Module 1:** **Module 2:**	Module 1: Turing Machines and Basic Concepts Basic Model for Turing Machines (TM): Definition and components. Turing Recognizable (Recursively Enumerable) Languages: Explanation and examples. Turing-Decidable (Recursive) Languages: Definition and examples. Closure Properties of Turing-Decidable Languages: Operations preserving decidability. Module 2: Variants and Equivalence of Turing Machines Variants of Turing Machines: Overview of multitape, nondeterministic, and other variants.	Smart Board	8L	Assignment based on Turning Machine	CO3

	Module 3: **Module 4:**	Nondeterministic Turing Machines (NTMs): Definition and equivalence with deterministic TMs. Equivalence of NDTMs with DTM: Understanding the computational power of nondeterminism. Module 3: Unrestricted Grammars and Equivalence Unrestricted Grammars: Definition and properties. Equivalence with Turing Machines: Understanding the expressive power of unrestricted grammars. Module 4: Advanced Concepts and Applications Turing Machines as Enumerators: Using TMs to enumerate sets and languages. Applications of Turing Machines: Real-world applications and implications in computer science and beyond. Research Directions and Challenges: Overview of current research areas and open problems in the theory of computation related to Turing machines. **Regulatory compliance**: GDPR, HIPAA **Case studies:** Implementation of AI ethics guidelines and best practices in engineering projects, Ethical decision-making processes and tools for engineers working with AI technologies				
Unit 4	**Module 1:** **Module 2:** **Module 3:**	Module 1: Church-Turing Thesis and Universal Turing Machine Church-Turing Thesis: Explanation and significance as a foundational principle of computer science. Universal Turing Machine: Definition and role as a model of computation capable of simulating any other Turing machine. Module 2: Universal and Diagonalization Languages Universal Languages: Definition and examples of languages recognized by universal Turing machines. Diagonalization Languages: Explanation and examples of languages constructed through diagonalization techniques. Module 3: Reductions and Rice's Theorem	Smart Board	8L		CO4

	Module 4:	Reduction between Languages: Techniques for transforming one problem into another. Rice's Theorem: Statement and implications for decidability of properties of languages. Module 4: Undecidable Problems about Languages Undecidable Problems: Exploration of problems about languages that are provably unsolvable by Turing machines. Implications and Applications: Understanding the significance and practical consequences of undecidability in computer science and mathematics.			Assignment based on Undecidability	
Unit 5	**Module 1:** **Module 2:** **Module 3:** **Module 4:**	Module 1: Time Complexity and Deterministic Turing Machines Time Complexity of Deterministic Turing Machines: Introduction to the concept of time complexity and its analysis for deterministic Turing machines. P and NP Classes: Explanation of the complexity classes P and NP and their significance in computational complexity theory. Module 2: Nondeterministic Turing Machines and NP-Completeness Time Complexity of Nondeterministic Turing Machines: Introduction to the concept of time complexity for nondeterministic Turing machines. NP-Completeness: Definition and implications of NP-completeness, including the concept of NP-complete problems. Module 3: Cook's Theorem and NP-Complete Problems Cook's Theorem: Statement and significance in computational complexity theory. Examples of NP-Complete Problems: Introduction to some classic NP-complete problems, such as the satisfiability problem (SAT), vertex cover, and traveling salesman problem (TSP). Module 4: Other NP-Complete Problems Exploration of Additional NP-Complete Problems: Introduction to other problems known to be NP-complete, such as the knapsack problem, graph coloring, and subset sum problem.	Smart Board	8L	Assignment based on Complexity	CO5

Total	40L

Text Books	
Sr No	**Book Details**
1.	Introduction to Information Security and Cyber Laws, Simplified Chinese Edition by Surya Prakash Tripathi, Ritendra Goel, 1 January ,2014.
2.	AI ETHICS: Paving the Path for Responsible Machine Learning, Shivanand Kumar, 2014.

Reference Books	
Sr No	**Book Details**
1.	Elements of the Theory of Computation, Harry R. Lewis and Christos H. Papadimitriou.
2.	Automata and Computability, Dexter C. Kozen.
3.	Introduction to the Theory of Computation, Michael Sipser.
4.	Introduction to Languages and the Theory of Computation, John Martin.
5.	Computers and Intractability: A Guide to the Theory of NP Completeness, M. R. Garey and D. S. Johnson.

Links	
Unit 1	https://nptel.ac.in/courses/106/104/106104028/Lecture 1 -10, Lecture 16, 17 18, 19

Unit 2	https://nptel.ac.in/courses/113/11111/1003016/
Unit 3	https://www.youtube.com/results?search_query=%23AutomataTheory
Unit 4	https://nptel.ac.in/courses/106/104/106104028/Lecture 11 -15
Unit 5	https://nptel.ac.in/courses/113/11111/1003016/

NIET Greater Noida Autonomous Institute	**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY** **GREATER NOIDA-201306** **(An Autonomous Institute)** **School of Computer Science in Emerging Technologies**

Subject Name: Computer Organization & Architecture	**L-T-P [3-0-0]**
Subject Code: BCSBS0303	**Applicable in Department: B.TECH. (CSBS)**
Prerequisite of Subject: Basics of Logic gates and their operations, and computer systems.	
Course Objective: Student will learn different types of organization, structures and functions of computer, to understand the data representation and computer arithmetic. They will understand the concept of control unit, memory organization, peripheral devices and pipelining.	

Course Outcome (CO)

Course Outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO 1	Identify the computer hardware and how software interacts with computer hardware.	K2
CO2	Demonstrate how to add and multiply integers and floating-point numbers using two's complement and IEEE floating point representation.	K3
CO3	Understand the principles and the implementation of computer arithmetic and Program using x86 instruction sets.	K3
CO4	Identify the memory technologies, input-output systems and evaluate the performance of memory system.	K3
CO5	State and compare properties of shared memory and distributed multiprocessor systems and cache coherency protocols.	K3

Unit No	Module	Topics Covered	Pedagogy	Lecture Required (L+P)	Aligned Practical/Assignment/Lab	CO Mapping
Unit 1	**Computer Basics and CPU**	Introduction of Computer Organization and Architecture, Functional blocks of a computer: CPU, memory, Input-output subsystems, control unit, Instruction set architecture of a CPU: Registers, instruction execution cycle, RTL interpretation of instructions, addressing modes, instruction set. Outlining instruction sets of some common CPUs.	**Lectures,** **Lab Cum Class(LCC) Mode,** **Hands-on Exercises**	8L+4T	Program 1 – Program 2	**CO1**
Unit 2	**Arithmetic Unit**	Data representation: Signed number representation, fixed and floating-point representations, IEEE 754 format character representation Computer arithmetic: Integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication – shift-and-add, Booth multiplier, carry save multiplier, etc. Division restoring and non-restoring techniques, floating point arithmetic, Introduction to x86 architecture.	**Lectures,** **Lab Cum Class(LCC) Mode,** **Hands-on Exercises**	8L+4T	Program 3- Program 10	**CO2**
Unit 3	**CPU control unit and Memory Design**	Hardwired and micro-programmed design approaches, design of a simple hypothetical CPU. Memory organization: Semiconductor memory technologies, Memory interleaving, Concept of hierarchical memory organization,	**Lectures,** **Lab Cum Class(LCC) Mode,** **Hands-on Exercises**	8L+4T	Program 11- program 14	CO3

		cache memory, cache size vs. block size, mapping functions, Replacement algorithms, write policies				
Unit 4	**Peripheral devices and their characteristics**	Input-output subsystems, I/O device interface, I/O transfers – program controlled, interrupt driven and DMA, privileged and non-privileged instructions, software interrupts and exceptions. Programs and processes – role of interrupts in process state transitions, I/O device interfaces – SCII, USB.	**Lectures,** **Lab Cum Class(LCC) Mode,** **Hands-on Exercises**	8L+4T	Program 15-Program 17	**CO4**
Unit 5	**Pipelining and Parallel Processors**	Basic concepts of pipelining, throughput and speedup, pipeline hazards.Parallel Processors: Introduction to parallel processors, Concurrent access to memory and cache coherency.	**Lectures,** **Lab Cum Class(LCC) Mode,** **Hands-on Exercises**	8L+4T	Program 18-Program 20	**CO5**
Total				**40L+20P=60**		

Text Books

Sr No	Book Details
1.	M. Mano, “Computer System Architecture”, 3rd Edition, Pearson Publication, 2007.2) Charu C. Agarwal, Recommender Systems : The Textbook

2.	John P. Hayes, Computer Architecture and Organization, Tata McGraw Hill, Third Edition, 1998.
3.	William Stallings, Computer Organization and Architecture-Designing for Performance, Pearson Education, Seventhedition,2006
Reference Books	
Sr No	**Book Details**
1.	Carl Hamacher, ZvonkoVranesic, Safwat Zaky Computer Organization, McGraw-Hill, Fifth Edition, Reprint2012
2.	Ray A K, Bhurchandi K M, “Advanced Microprocessors and Peripherals”, TM.
Links	
Unit 1	https://www.youtube.com/watch? v=L9X7XXfHYdU&list=PLxCzCOWd7aiHMonh3G6QNKq53C6oNXGrX
Unit 2	https://www.youtube.com/watch?v=WLgXUPOjKEc
Unit 3	https://www.youtube.com/watch?v=BPhWlFIU1rc
Unit 4	https://www.youtube.com/watch?
Unit 5	https://www.youtube.com/watch?v=nxryfWg5Hm4

NIET Greater Noida Autonomous Institute	**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY** **GREATER NOIDA-201306** **(An Autonomous Institute)** **School of Computer Science in Emerging Technologies**

Subject Name: Object Oriented Programming	**L-T-P [3-0-0]**
Subject Code: BCSBS0302	**Applicable in Department: B.TECH. (CSBS)**

Prerequisite of Subject: Understand basic programming, data structures, and logic; grasp OOP concepts like classes, objects, and inheritance; and practice debugging.

Course Objective: Students are able to gain a comprehensive understanding of procedural programming in C and object-oriented programming in C++ and Java. They will grasp fundamental OOP concepts, design and develop models using UML tools, and demonstrate standard techniques such as modularity and I/O operations, essential for effective software development.

Course Outcome (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO 1	Identify the concepts of procedural programming and its features.	K2
CO2	Demonstrate the concept of procedural language and object-oriented language.	K3
CO3	Implement the fundamental concept of object-oriented programming language using classes and objects.	K3
CO4	Implement the concept of reusability and data hiding using C++ and also demonstrate the generic concept.	K3
CO5	Design and develop the object-oriented model by using UML diagrams.	K6

Syllabus

Unit No	Module	Topics Covered	Pedagogy	Lecture Required (T=L+P)	Aligned Practical/Assignment/Lab	CO Mapping
Unit 1	**Procedural programming, An Overview of C**	Types Operator and Expressions, Scope and Lifetime, Constants, Pointers, Arrays, and References, Control Flow, Functions and Program Structure, Namespaces, Error handling, Input and Output (C-way), Library Functions (string, math, stdlib), Command line arguments, Pre-processor directive.	**Lectures, Lab Cum Class(LCC) Mode, Hands-on Exercises**	8L+4T	Program 1- Program 3	**CO1**
Unit 2	**C and C++**	Single line comments, Local variable declaration within function scope, function declaration, Function overloading, Stronger type checking, Reference variable, Parameter passing – value vs reference, Passing pointer by value or reference, Operator new and delete, Typecasting operator, Inline Functions in contrast to macro, Default arguments.	**Lectures, Lab Cum Class(LCC) Mode, Hands-on Exercises**	8L+4T	Program 4- Program 7	**CO2**
Unit 3	**The Fundamentals of Object-Oriented Programming**	Necessity for OOP, Data Hiding, Data Abstraction, Encapsulation, Procedural Abstraction, Class and Object. More extensions to C in C++ to provide OOP Facilities: Scope of Class and Scope Resolution Operator, Member Function of a Class, Private, Protected and Public Access Specifier, this Keyword, Constructors and Destructors, friend class, Error handling (exception).	**Lectures, Lab Cum Class(LCC) Mode, Hands-on Exercises**	8L+4T	Program 8- Program 15	**CO3**
Unit 4	**Essentials of Object-Oriented**	Necessity for OOP, Data Hiding, Data Abstraction, Encapsulation, Procedural Abstraction, Class and Object. More extensions to C in C++ to provide OOP Facilities: Scope of Class and Scope Resolution	**Lectures, Lab Cum Class(LCC) Mode,**	8L+4T	Program 16- Program 18	**CO4**

	Programming	Operator, Member Function of a Class, Private, Protected and Public Access Specifier, this Keyword, Constructors and Destructors, friend class, Error handling (exception).	**Hands-on Exercises**			
Unit 5	**Object Oriented Design and Modeling**	Input and Output: Streams, Files, Library functions, formatted output UML concept, Use case for requirement capturing, Class diagram, Activity diagram and Sequence Diagram for design, Corresponding C++ code from design	**Lectures,** **Lab Cum Class(LCC) Mode,** **Hands-on Exercises**	8L+4T	Program 19-Program 20	**CO5**
Total				**40L+20P=60**		

Text Books

Sr No	Book Details
1.	The C++ Programming Language, Bjarne Stroustrup, Addison Wesley, 4th Edition.
2.	C++ and Object-Oriented Programming Paradigm, Debasish Jana, PHI Learning Pvt. Ltd, 3rd Edition.

Reference Books

Sr No	Book Details
1.	Programming – Principles and Practice Using C++, Bjarne Stroustrup, Addison Wesley, 2nd Edition
2.	The Design and Evolution of C++, Bjarne Stroustrup, Addison Wesley, 1st Edition.

Links

Unit 1	https://www.youtube.com/watch?v=bIzTKJzs92w
Unit 2	https://www.youtube.com/watch?v=pRC09Tz9iVE
Unit 3	https://www.youtube.com/watch?v=A38y7OO8OK4
Unit 4	https://www.youtube.com/watch?v=rr7HVs4d1Qo
Unit 5	https://www.youtube.com/watch?v=fJW65Wo7IHI

NIET Greater Noida Autonomous Institute	**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY** **GREATER NOIDA-201306** **(An Autonomous Institute)** **School of Computer Science in Emerging Technologies**

Subject Name: Computational Statistics **L-T-P [3-0-0]**

Subject Code: BCSBS0301 **Applicable in Department: B.TECH. (CSBS)**

Prerequisite of Subject: Statistics & Probability, Python

Course Objective: The objective of the course is to enable the student to use modern computer intensive statistical methods as tools to investigate statistical procedures, perform inference and conduct statistical analysis using computation and simulation

Course Outcome (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO 1	Analyze the relationship between multiple normally distributed	K4
CO2	variables.	K5
CO3	Develop different discriminant functions	K4
CO3	Perform dimensionality reduction using PCA.	K4
CO3	Analyze variability among observed and correlated variables in terms of	K4

Syllabus

Unit No	Module	Topics Covered	Pedagogy	Lecture Required (L+P)	Aligned Practical/Assignment/Lab	CO Mapping
Unit 1	**Multivariate Normal Distribution**	Multivariate Normal Distribution Functions, Conditional Distribution and its relation to regression model, Estimation of parameters.	**Lecture**	8L+4T	Program 1- Program 4	**CO1**
Unit 2	**Discriminant Analysis**	Statistical background, linear discriminant function analysis, Estimating linear discriminant functions and their properties.	**Lecture**	8L+4T	Program 5- Program 15	**CO2**
Unit 3	**Principal Component Analysis**	Principal components, Algorithm for conducting principal component analysis, deciding on how many principal components to retain, H-plot.	**Lecture**	8L+4T	Program 16- Program 17	**CO3**
Unit 4	**Factor Analysis**	Factor analysis model, Extracting common factors, determining number of factors, Transformation of factor analysis solutions, Factor scores.	**Lecture**	8L+4T	Program 18- Program 19	**CO3**

Unit 5	**Clustering**	Introduction, Types of clustering, Correlations and distances, clustering by partitioning methods, hierarchical clustering, overlapping clustering, K-Means Clustering- Profiling and Interpreting Cluster	**Lecture**	8L+4T	Program 20	**CO3**
Total				**40L+20P=60**		

Text Books

Sr No	**Book Details**
1	An Introduction to Multivariate Statistical Analysis, T.W. Anderson.
2	Applied Multivariate Data Analysis, Vol I & II, J.D. Jobson.
3	Statistical Tests for Multivariate Analysis, H. Kris.
4	Programming Python, Mark Lutz.

5	Python 3 for Absolute Beginners, Tim Hall and J-P Stacey. Beginning Python: From Novice to Professional, Magnus Lie Hetland. Edition, 2005.
Reference Books	
Sr No	**Book Details**
1	Regression Diagnostics, Identifying Influential Data and Sources of Collinearety, D.A. Belsey, E. Kuh and R.E. Welsch
2	Applied Linear Regression Models, J. Neter, W. Wasserman and M.H. Kutner.
3	The Foundations of Factor Analysis, A.S. Mulaik.
4	Introduction to Linear Regression Analysis, D.C. Montgomery and E.A. Peck.
5	Cluster Analysis for Applications, M.R. Anderberg.
6	Multivariate Statistical Analysis, D.F. Morrison.
Links	
Unit 1	https://www.youtube.com/watch?v=YgExEVji7xs
Unit 2	https://www.youtube.com/watch?v=ImKKekAyFls
Unit 3	https://www.youtube.com/watch?v=hkCT-6KJAK0
Unit 4	https://www.youtube.com/watch?v=n3y3xLNoPk4
Unit 5	https://www.youtube.com/watch?v=NhimXdFenrg https://www.youtube.com/watch?v=CwjLMV52tzI https://www.youtube.com/watch?v=qg_M37WGKG8

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREATER NOIDA-201306
(An Autonomous Institute)
School of Computer Science in Emerging Technologies

Subject Name: Software Engineering	**L-T-P [3-0-0]**
Subject Code: BCSBS0304	**Applicable in Department: B.TECH. (CSBS)**
Prerequisite of Subject: Basic knowledge about software and its types, and knowledge of any Object-Oriented programming language.	
Course Objective: To enable students to develop methods and procedures for software development that can scale up for large systems and that can be used consistently to produce high-quality software at low cost and with a small cycle of time.	

Course Outcome (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO 1	Explain various software characteristics and quality attributes and will be able to use engineering approach on small and large projects	K2
CO2	Analyze different software Development Models, understand various techniques of schedule and effort estimation.	K4
CO3	Apply basic software quality assurance practices to ensure that design, development meet or exceed applicable standards	K3
CO4	Demonstrate the contents of a Software Requirements Specification (SRS) and compare and contrast various methods for software design.	K4
CO5	Understand the concepts of object-oriented system development, formulate testing strategies for software systems, and employ techniques such as unit, integration, and system testing.	K2

Syllabus

Unit No	Module	Topics Covered	Pedagogy	Lecture Required (L+P)	Aligned Practical/Assignment /Lab	CO Mapping
Unit 1	**Introduction**	Programming in the small vs. programming in the large; software project failures and importance of software quality and timely availability; engineering approach to software development; role of software engineering towards successful execution of large software projects; emergence of software engineering as a discipline, Software Characteristics.	**Lectures, Lab Cum Class(LCC) Mode, Hands-on Exercises**	8L+4T	Program 1- Program 3	**CO1**
Unit 2	**Service Project Management**	Basic concepts of life cycle models – different models and milestones; software project planning – identification of activities and resources; concepts of feasibility study; techniques for estimation of schedule and effort; software cost estimation models and concepts of software engineering economics; techniques of software project control and reporting; introduction to measurement of software size; introduction to the concepts of risk and its mitigation; configuration management.	**Lectures, Lab Cum Class(LCC) Mode, Hands-on Exercises**	8L+4T	Program 4- Program 5	**CO2**
Unit 3	**Software Quality and Reliability**	Internal and external qualities; process and product quality; principles to achieve software quality; introduction to different software quality models like McCall, Boehm, FURPS / FURPS+, Dromey, ISO – 9126; introduction to Capability Maturity Models (CMM and CMMI); introduction to software reliability, reliability models and estimation.	**Lectures, Lab Cum Class(LCC) Mode, Hands-on Exercises**	8L+4T	Program 6- Program 7	**CO3**

Unit 4	**Software Requirements Analysis, Design and Construction**	Introduction to Software Requirements Specifications (SRS) and requirement elicitation techniques; techniques for requirement modeling – Decision tables, event tables, State transition tables, Petri nets; requirements documentation through use cases; Introduction to UML, Introduction to software metrics and metrics-based control methods; Measures of code and design quality.	**Lectures, Lab Cum Class(LCC) Mode, Hands-on Exercises**	8L+4T	Program 8-Program 9	**CO4**
Unit 5 **Module 2:**	**Object Oriented Analysis, Design and Construction**	Concepts -- the principles of abstraction, modularity, specification, encapsulation and information hiding; concepts of abstract data type; Class Responsibility Collaborator (CRC) model; quality of design; design measurements; concepts of design patterns; Refactoring; object-oriented construction principles; object-oriented metrics. Software Testing: Introduction to faults and failures; basic testing concepts; concepts of verification and validation; black box and white box tests; white box test coverage – code coverage, condition coverage, branch coverage; basic concepts of black-box tests – equivalence classes, boundary value tests, usage of state tables; testing use cases; transaction-based testing; testing for non-functional requirements – volume, performance and efficiency; concepts of inspection.	**Lectures, Lab Cum Class(LCC) Mode, Hands-on Exercises**	8L+4T	Program 10	**CO5**
Total				**40L+20P=60**		
Text Books						
Sr No	**Book Details**					

1	Software Engineering, Ian Sommerville, Edition 9, Pearson
Reference Books	
Sr No	**Book Details**
1	Fundamentals of Software Engineering, Carlo Ghezzi, Jazayeri Mehdi, Mandrioli Dino.
2	Software Requirements and Specification: A Lexicon of Practice, Principles and Prejudices, Michael Jackson.
3	The Unified Development Process, Ivar Jacobson, Grady Booch, James Rumbaugh.
4	Design Patterns: Elements of Object-Oriented Reusable Software, Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides.
5	Software Metrics: A Rigorous and Practical Approach, Norman E Fenton, Shari Lawrence Pfleeger .
6	Fundamentals of Software Engineering, Carlo Ghezzi, Jazayeri Mehdi, Mandrioli Dino.
Links	
Unit 1	https://youtu.be/x-jqSXYE4S4
Unit 2	https://youtu.be/mGkkZoFc-4I
Unit 3	https://youtu.be/sGxgZxwuHzc
Unit 4	https://youtu.be/BNk7vni-1Bo
Unit 5	https://youtu.be/8swQr0kckZI

NIET Greater Noida Autonomous Institute	**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY** **GREATER NOIDA-201306** **(An Autonomous Institute)** **School of Computer Science in Emerging Technologies**

Subject Name: Financial Management	**L-T-P [2-0-0]**
Subject Code: BCSBS0305	**Applicable in Department: B.TECH. (CSBS)**
Prerequisite of Subject: Basic knowledge of accounting, mathematics, economics, business principles, and analytical skills.	
Course Objective: This course is primarily intended to equip the students with the knowledge of managing funds & understand the risk and return profile of investments. Further this course also facilitates the understanding and practice of financial decisions both in long term and short term.	

Course Outcome (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO 1	Understand the fundamental concepts of financial management and time value of money.	K2
CO2	Analyzing various sources of finance and the cost of raising capital.	K4
CO3	Understand and evaluate the leverage condition of companies.	K2
CO4	Appreciate the basic concepts of capital budgeting and applying them in estimating projects.	K3
CO5	Manage the working capital needs and maintaining liquidity of the business	K3

Syllabus

Unit No	Module	Topics Covered	Pedagogy	Lecture Required (L+P)	Aligned Practical/ Assignment/Lab	CO Mapping
Unit 1	**Concept of Finance**	Finance & Financial Management: Meaning and Nature; Financial decisions, Profit Vs. Wealth Maximization	**Discussion, PPT & Video**	6L	Assignment based on Finance and Value of Money	**CO1**
	Time Value of Money	Time Value of Money- Compounding Techniques and Discounting Techniques.	**Discussion, PPT & Video**			
Unit 2	**Cost of capital**	Meaning and significance of cost of capital; Calculation of cost of debt, Preference share capital, Equity share capital, and retained earnings.	**Discussion, PPT & Video**	6L	Assignment based on cost and risk & return.	**CO2**
	Risk & Return	Risk & Return: Defining Risk and Return, Attitudes Toward Risk, Risk and Return in a Portfolio Context, Diversification, The Capital Asset Pricing Model (CAPM).	**Discussion, PPT & Video**			
Unit 3	**Concept of Operating, Financial Leverage**	Meaning and concepts of Operating, Financial Leverage, and combined leverage:,	**Discussion, PPT & Video**	6L	Assignment based on Financial Leverage	**CO3**
	Measurement of Leverage	Measurement of leverages; Financial and operating leverage, combined leverage.	**Discussion, PPT & Video**			

Unit 4	**Concept of Capital Budgeting**	Capital Budgeting: The Capital Budgeting Concept & Process - An Overview, Generating Investment Project Proposals, Estimating Project, After Tax Incremental Operating Cash Flows,	**Discussion, PPT & Video**	6L	Assignment based on capital Budgeting	**CO4**
	Techniques of capital budgeting	Capital Budgeting Techniques, Project Evaluation and Selection - Alternative Methods	**Discussion, PPT & Video**			
Unit 5	**Working capital management**	Overview, Working Capital Issues, Financing Current Assets (Short Term and Long Term- Mix), Combining Liability Structures and Current Asset Decisions, Estimation of Working Capital	**Discussion, PPT & Video**	6L	Assignment based on working management and accounts management	**CO5**
	Accounts receivable management	Cash Management: Motives for Holding cash, Speeding Up Cash Receipts, Slowing Down CashPayouts, Outsourcing Cash Balances to maintain and Factoring Accounts Receivable Management: Credit & Collection Policies, Analyzing the Credit Applicant, Credit References, Selecting optimum Credit period.	**Discussion, PPT & Video**			
Total				**30L**		

Text Books

Sr No	Book Details
1.	Chandra, Prasanna - Financial Management - Theory & Practice, Tata McGraw Hil

Reference Books

Sr No	Book Details
1.	Srivastava, Misra: Financial Management, OUP
2.	Van Horne and Wachowicz: Fundamentals of Financial Management, Prentice Hall/ Pearson Education

Links

Unit 1	https://youtu.be/CCQwz_Gwo6o?si=RiCFQz3f2ltwqvUL
Unit 2	https://youtu.be/dgPlxTq9lLw?si=7W_oxwfwe-VTpiIZ
Unit 3	https://youtu.be/Hus0QjGA35E?si=uVLIPkz6XBRKHjmK
Unit 4	https://youtu.be/FiEFngDYUzA?si=j1jL5JBsa30MWFrM
Unit 5	https://youtu.be/zeYN_013jQ4?si=vGI-Xb6B-A2Q-mNj

Home Management

Case study materials book will be given to students. Students are required to meet in groups before coming to class and prepare on the case for the day. Instructor may ask the student groups to present their analysis and findings to the class.

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY GREATER NOIDA-201306

(An Autonomous Institute)

School of Computer Science in Emerging Technology

Subject Name: Computer Organization & Architecture Lab	**L-T-P [0-0-2]**
Subject Code: BCSBS0353	**Applicable in Department: B.Tech.(CSBS)**

Lab Practicals

Course Objective: Student will learn different types of organization, structures and functions of computer, to understand the data representation and computer arithmetic. They will understand the concept of control unit, memory organization, peripheral devices and pipelining.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO1	Implement combinational and sequential circuits.	K3
CO2	Implement shift registers, Arithmetic Logic Units (ALUs), and control units.	K3
CO3	Analyze and implement input/output systems with internal registers.	K4

List of Practical's

Sr. No.	Program Title	CO Mapping
1	Design the control unit of a computer using hardwiring based on its RTL description.	CO1
2	Write a program to control an LED or 7-segment display. The program should turn the LED on and off or	CO1

	display digits based on user input.	
3	Implementation of Half adder and full adder	CO2
4	Implementation of Half subtractor and full subtractor	CO2
5	Implementation of array multiplier	CO2
6	Implementation of array multiplexer and demultiplexer	CO2
7	Implementation of array encoder and decoder	CO2
8	Implementation of Synchronous and Asynchronous counter	CO2
9	Implementation of Shift registers.	CO2
10	Design of an arithmetic and logic unit	CO2
11	Design of an 8-bit input/output system with four 8-bit internal register.	CO2
12	Design the data path of a computer from its registers transfer language	CO2
13	Write an assembly or C program to read data from a keyboard or another input device using program-controlled I/O.	CO2
14	Write a program that configures a microprocessor or microcontroller to use interrupts for I/O operations. The program should demonstrate the handling of an interrupt when data is received from an input device.	CO3
15	Write a program to communicate with a USB device, such as a flash drive or keyboard, to read or write data.	CO3
16	Write a program to simulate a basic instruction pipeline with 4 stages: Fetch, Decode, Execute, and Write Back.	CO3
17	Write a program that simulates a pipeline processor and introduces various hazards like data hazards, control hazards, and structural hazards. Implement techniques such as forwarding, stalling, and branch prediction to resolve these hazards.	CO3
18	Write a program in a parallel programming language (e.g., OpenMP or MPI) to perform matrix multiplication using multiple processors.	CO3
19	Write a simulation program to model a multi-processor system where each processor has its own cache.	CO3

	Implement a cache coherence protocol (e.g., MESI) to ensure data consistency across all caches when multiple processors access shared memory.	
20	Write a program that simulates a multi-core processor system where multiple cores try to access and modify shared memory simultaneously. Implement synchronization techniques such as locks or semaphores to prevent race conditions.	CO3
Required Software and Tools		
1.	Paid/Unpaid-Unpaid (Note: Course Era as per the student bucket): Google Co-Lab	

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY GREATER NOIDA-201306

(An Autonomous Institute)

School of Computer Science in Emerging Technology

Subject Name: Object Oriented Programming Lab	**L-T-P [0-0-2]**
Subject Code: BCSBS0352	**Applicable in Department: B.Tech. (CSBS)**

Lab Practicals

Course Objective: Students are able to provide students with hands-on experience in implementing object-oriented programming concepts using C++ and Java. This includes designing and developing applications that emphasize key principles such as inheritance, polymorphism, and encapsulation.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO1	Implement basic object-oriented programming concepts such as classes, objects, inheritance, and polymorphism in C++ and Java.	K6
CO2	Design and develop small-scale software projects using UML diagrams and object-oriented principles.	K6
CO3	Debug and test object-oriented programs to ensure proper functionality and adherence to design specifications.	K4

List of Practical's

Sr. No.	**Program Title**	**CO Mapping**

1	Parameter passing: passing parameter by value vs by reference, passing array as constant pointer.	CO1
2	Function overloading: writing string operations like strcat and strncat, strcpy and strncpy as overloaded functions.	CO1
3	Dynamically allocating space for a pointer depending on input and doing this repeatedly, depending on different inputs and finally de-allocating the pointer.	CO1
4	Define class complex with all possible operations: constructor, destructor, copy constructor, assignment operator with the data members stored as pointer to integers.	CO2
5	Define class vector of integers with all possible operations like constructor, destructor, copy constructor and assignment operators.	CO2
6	Define class matrix of integers with all possible operations like constructor, destructor, copy constructor and assignment operators.	CO2
7	Define class matrix of integers using vector, with all possible operations like constructor, destructor, copy constructor and assignment operators.	CO2
8	Define class stack, queue, linked-list, array, set using some data-type (int) with data members kept as private and functions kept in both protected and public sections.	CO3
9	Define class complex with all possible operators: constructor, destructor, copy constructor, assignment operator and operators >, <, >=, <=, ==, ++ (pre and post), +, +=, ( ), with the data members stored as pointer to integers.	CO2
10	Define class vector of integers with all possible operations like constructor, destructor, copy constructor and assignment operators>, <, >=, <=, ==, ++ (pre and post), +, +=, ( ).	CO2
11	Define class matrix of integers with all possible operations like constructor, destructor, copy constructor and assignment operators>, <, >=, <=, ==, ++ (pre and post), +, +=, ( ).	CO2
12	Define class matrix of integers using vector, with all possible operations like constructor, destructor, copy constructor and assignment operators>, <, >=, <=, ==, ++ (pre and post), +, +=, ( ).	CO2
13	Define stack and queue inherited from array class, with standard functions and operators.	CO3
14	Define a class called ‘array’ with data type passed as template type with constructor, destructor, copy constructor and assignment operators and index operator.	CO3
15	Define template functions for compare and use it in the algorithms like bubble sort, insertion sort, merge sort.	CO2
16	Write a C++ program that demonstrates how to format output using manipulators like setw, setprecision, and fixed. Display a table of numbers with different formats (e.g., right-aligned, fixed-point notation).	CO2
17	Implement a program that reads different data types (e.g., integer, float, string) from the user. Use input manipulators like ws to handle whitespaces and getline for reading entire lines. Demonstrate how these manipulators affect the input operation.	CO3
18	Create a class Complex to represent complex numbers. Overload the << and >> operators to enable formatted input and output of complex numbers. Write a program to read and display a complex number using these	CO3

	overloaded operators.	
19	Define class model for complex number, student class, book class and show it using UML diagram as well as concrete class.	CO3
20	Show behavioral modeling through sequence diagram and activity diagram for workflow in a typical log-in, log-out situation.	CO3
21	Design a program that combines the use of manipulators and overloaded operators to format and display a list of student records (name, roll number, and grade) in a tabular format.	CO2
22	Write a C++ program that defines a custom manipulator to format dates in a specific style (e.g., DD-MM-YYYY). Demonstrate the use of this custom manipulator with input and output streams.	CO2
Required Software and Tools		
1.	C/C++ Compiler/Dev C++	

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY GREATER NOIDA-201306

(An Autonomous Institute)

School of Computer Science in Emerging Technology

Subject Name: Computational Statistics Lab	**L-T-P [0-0-2]**
Subject Code: BCSBS0351	**Applicable in Department: CSBS**

Lab Practicals

Course Objective: Students are able to learn and apply statistical methods and computational tools for data analysis, including data manipulation, visualization, and statistical modeling.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO1	Implement classes, methods, and handle text files, applying Python programming concepts.	K3
CO2	Perform data manipulation, including regular expressions (RE) for text processing, and implement aggregation and group by operations.	K4
CO3	Solve time series-based problems and visualize data using the Matplotlib package in Python	K4

List of Practical's

Sr. No.	**Program Title**	**CO Mapping**

1	Print multiplication table of a given number.	CO1
2	Given a list, iterate it, and display numbers divisible by five, and if you find a number greater than 150, stop the loop iteration.	CO1
3	list1 = [12, 15, 32, 42, 55, 75, 122, 132, 150, 180, 200]	CO1
4	Given a list, iterate it, and display numbers divisible by five, and if you find a number greater than 150, stop the loop iteration..	CO1
5	Write a program to create a class having a parameterized constructor, a class method and a static method.	CO1
6	Write a Python program to copy the contents of a file to another file.	CO1
7	Write a Python program to count number of words in a text file.	CO3
8	Write a Pandas program to split the following dataframe into groups based on all columns and calculate Groupby value counts on the dataframe. Test Data: Id type book 0 1 10 Math 1 2 15 English 2 1 11 Physics 3 1 20 Math 4 2 21 English 5 1 12 Physics 6 2 14 English	CO3
9	Write a Pandas program to partition each of the passengers into four categories based on their age. Note: Age categories (0, 10), (10, 30), (30, 60), (60, 80)	CO2
10	Write a Python program to check that a string contains only a certain set of characters (in this case a-z, A-Z and 0-9)	CO2
11	Write a Python program that matches a string that has an ‘a’ followed by zero or more b's.	CO2
12	Write a Python program that matches a word at the beginning of a string	CO2
13	Write a Python program to remove leading zeros from an IP address..	CO3
14	Write a Pandas program to create a) Datetime object for Jan 15 2012. b) Specific date and time of 9:20 pm. c) Local date and time. d) A date without	CO3

	time. e) Current date. f) Time from a datetime. g) Current local time..	
15	Write a Pandas program to create a date from a given year, month, day and another date from a given string formats.	CO3
16	Write a Pandas program to print the day after and before a specified date. Also print the days between two given dates.	CO3
17	Write a Pandas program to create a time series using three months frequency.	CO3
18	Write a Pandas program to create a sequence of durations increasing by an hour.	CO3
19	Write a Pandas program to check if a day is a business day (weekday) or not..	CO3
20	Write a Pandas program to create a Pivot table with multiple indexes from a given excel sheet	CO3
21	Write a Pandas program to create a Pivot table and find the total sale amount region wise, manager wise.	CO3
22	Write a Pandas program to create a Pivot table and count the manager wise sale and mean value of sale amount	CO3
23	Write a Pandas program to create a Pivot table and find the maximum sale value of the items.	CO3
24	Write a Pandas program to create a Pivot table and find the minimum sale value of the items.	CO3
25	Write a Pandas program to create a Pivot table and find the maximum and minimum sale value of the items	CO3
26	Write a Python program to draw a line using given axis values taken from a text file, with suitable label in the x axis, y axis and a title. Test Data: test.txt 1 2 2 4 3 1	CO3
27	Write a Python program to plot two or more lines on same plot with suitable	CO3

	legends of each line.	
Required Software and Tools		
1.	Paid/Unpaid-Unpaid (Note: Course Era as per the student bucket): Google Colab , Jupyter notebook	

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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School of Computer Science in Emerging Technology

Subject Name: Software Engineering Lab	**L-T-P [0-0-2]**
Subject Code: BCSBS0354	**Applicable in Department: B.Tech. (CSBS)**

Lab Practicals

Course Objective: Students are able to develop software solutions by applying software engineering principles, integrating various development models and estimation techniques. They can implement quality assurance practices and testing strategies to ensure that the software meets specified standards and requirements.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO1	Develop software solutions using software engineering principles.	K3
CO2	Implement software development models and estimation techniques.	K4
CO3	Apply quality assurance practices and testing strategies.	K4

List of Practical's

Sr. No.	**Program Title**	**CO Mapping**
1	Development of requirements specification on any of the given topic. • Covid vaccination management system	CO1

	• Online grocery store • Online food delivery system • Online medical store • Doctors online OPD	
2	Develop function-oriented design using SA/SD methodology.	CO1
3	Develop object-oriented design using UML.	CO2, CO3
4	Designing and implementing test cases manually.	CO3
5	Designing and implementing test cases automatically using a tool.	CO3
6	Use of appropriate CASE tools and other tools (any one) such as configuration management tools, program analysis tools in the software life cycle.	CO3
7	Create a Software Design Document (SDD): Object and Class diagram	CO1
8	Create Interaction diagram: sequence diagram, collaboration diagram for SDD.	C02
9	Design test suite for equivalence class partitioning	CO3
10	Mini Project with CASE tools	CO3
Required Software and Tools		
1.	Star UML, MS Word	

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY GREATER NOIDA-201306

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School of Computer Science in Emerging Technology

Subject Name: Indian Constitution	**L-T-P [2-0-0]**
Subject Code: BNC0303	**Applicable in Department: CSBS**

Pre-requisite of Subject: Basic understanding of Indian history, civics, the structure of government, and fundamental political concepts.

Course Objective: To introduction to the fundamental concepts in machine learning and popular machine learning algorithms. To understand the standard and most popular supervised learning algorithm.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO1	Identify and explore the basic features and modalities about Indian constitution.	K1
CO2	Differentiate and relate the functioning of Indian parliamentary system at the center and state level.	K2
CO3	Differentiate different aspects of Indian Legal System and its related bodies	K4
CO4	Discover and apply different laws and regulations related to engineering practices.	K4
CO5	Correlate role of engineers with different organizations and governance models.	K4

Syllabus

Unit No	Module	Topics Covered	Pedagogy	Lecture Required (L+P)	Aligned Practical/Assignment/Lab	CO Mapping
Unit 1	**Introduction and Basic Information about Indian Constitution**	Meaning of the constitution law and constitutionalism, Historical Background of the Constituent Assembly, Government of India Act of 1935 and Indian Independence Act of 1947,Enforcement of the Constitution, Indian Constitution and its Salient Features, The Preamble of the Constitution, Fundamental Rights, Fundamental Duties, Directive Principles of State Policy, Parliamentary System, Federal System, CentreState Relations, Amendment of the Constitutional Powers and Procedure, The historical perspectives of the constitutional amendments in India, Emergency Provisions: National Emergency, President Rule, Financial Emergency, and Local Self Government – Constitutional Scheme in India.	Discussion, PPT & Video	6L	Assignment 1 related to Constitutional drafting.	**CO1**

Unit 2	**Union Executive and State Executive**	Powers of Indian Parliament Functions of Rajya Sabha, Functions of Lok Sabha, Powers and Functions of the President, Comparison of powers of Indian President with the United States, Powers and Functions of the Prime Minister, Judiciary – The Independence of the Supreme Court, Appointment of Judges, Judicial Review, Public Interest Litigation, Judicial Activism, Lok Pal, Lok Ayukta, The Lokpal and Lok ayuktas Act 2013, State Executives – Powers and Functions of the Governor, Powers and Functions of the Chief Minister, Functions of State Cabinet, Functions of State Legislature, Functions of High Court and Subordinate Courts.	Discussion, PPT & Video	6L	Assignment 1 related to Government functions.	**CO2**
Unit 3	**Introduction and Basic Information about Legal System**	The Legal System: Sources of Law and the Court Structure: Enacted law -Acts of Parliament are of primary legislation, Common Law or Case law, Principles taken from decisions of judges constitute binding legal rules. The Court System in India and Foreign Courtiers (District Court, District Consumer Forum, Tribunals, High Courts, Supreme Court). Arbitration: As an alternative to resolving disputes in the normal courts, parties who are in dispute can agree that this will instead be referred to arbitration. Contract law, Tort, Law at workplace.	Discussion, PPT & Video		Assignment 1 related to Legal framework.	**CO3**

				6L		
Unit 4	**Intellectual Property Laws and Regulation to Information**	Intellectual Property Laws: Introduction, Legal Aspects of Patents, Filing of Patent Applications, Rights from Patents, Infringement of Patents, Copyright and its Ownership, Infringement of Copyright, Civil Remedies for Infringement, Regulation to Information Introduction, Right to Information Act, 2005, Information Technology Act, 2000, Electronic Governance, Secure Electronic Records and Digital Signatures, Digital Signature Certificates, Cyber Regulations Appellate Tribunal, Offences, Limitations of the Information Technology Act.	Discussion, PPT & Video	6L	Assignment 1 related to IP laws overview.	**CO4**
Unit 5	**Business Organizations and E-Governance**	Sole Traders, Partnerships: Companies: The Company's Act: Introduction, Formation of a Company, Memorandum of Association, Articles of Association, Prospectus, Shares, Directors, General Meetings and Proceedings, Auditor, Winding up. E-Governance and role of engineers in E-Governance, Need for reformed engineering serving at the Union and State level, Role of I.T. professionals in Judiciary, Problem of Alienation and Secessionism in few states creating hurdles in Industrial development.	Discussion, PPT & Video	6L	Assignment 1 related to Business structures and e-governance.	**CO5**
Total				**30L**		
Text Books						
Sr. No.	**Book Details**					

1	Brij Kishore Sharma: Introduction to the Indian Constitution, 8th Edition, PHI Learning Pvt. Ltd
Reference Books	
Sr. No.	**Book Details**
1	P. Narayan: Intellectual Property Law, Eastern Law House, New Delhi
Links	
Unit 1	https://www.youtube.com/live/h9y2ZJKz_gc?si=9haR6FUNQjJhEU3i
Unit 2	https://www.youtube.com/live/xkS-MG1rQ0o?si=qEZ3hXGkoteSZd3_
Unit 3	https://www.youtube.com/live/OmYaSPWHy_M?si=KkKjKRpkjbX0Uz0U
Unit 4	https://www.youtube.com/live/Bjnm-3Ka-FE?si=o16b5pznOl4aGXQG
Unit 5	https://www.youtube.com/live/OWWivssIBnE?si=yMDi37Sg8jlFIpv7

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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School of Computer Science in Emerging Technologies

Subject Name: Operating Systems	**L-T-P [3-0-0]**
Subject Code: BCSBS0403	**Applicable in Department: B.TECH. (CSBS)**
Prerequisite of Subject: Basic knowledge of computer fundamentals and organization is required.	
Course Objective: The objective of this course is to provide an understanding of the basic structure and functions of an operating system and deliver the skills needed to develop and customize Linux shell programs to make effective use of a wide range of standard Linux programming.	

Course Outcome (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO 1	Create process and threads using system commands	K3
CO2	Implement concept of process management policies, CPU Scheduling and thread management.	K3
CO3	Implement mutual exclusion using semaphores to avoid concurrency problems	K3
CO2	Implement algorithms of various memory management schemes	K3
CO3	Implement algorithms used for disk scheduling	K3

Syllabus

Unit No	Module	Topics Covered	Pedagogy	Lecture Required (L+P)	Aligned Practical/Assignment/Lab	CO Mapping
Unit 1	**Fundamentals of Operating Systems**	Operating System, Operatic System characteristics, Functions of Operating Systems, Types of Operating System, Layered Structure, System call, Kernel, Multiprogramming and Multitasking, Overview of MS-DOS, Windows OS, Unix/Linux OS	**Lectures, PPTs and Smart Interactive Panel**	8L+4P	Assignment related to fundamental of OS Program 1- Program 8	**CO1**
	Process Management	Processes: Definition, Process Relationship, Different states of a Process, Process State transitions, Process Control Block (PCB), Context switching.				
	Synchronization problems	Implement Synchronization problems by using semaphores and mutex				
Unit 2	**CPU Scheduling**	CPU Scheduling Criteria, Pre-emptive and Non Pre-emptive Scheduling, Algorithm: FCFS, SJF, SRTF, Round Robin, Priority Scheduling, Multilevel Queue Scheduling and Multilevel Feedback Queue Scheduling, Context Switching.	**Lectures, PPTs and Smart Interactive Panel**	8L+4P	Assignment related to scheduling and threads Program 9- Program 15	**CO1**
	Thread & Schedulers	Thread: Definition, Various states, Benefits of threads, Types of threads, Concept of multithreads. Foundation and Scheduling objectives, Types of Schedulers, Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time.				

Unit 3	**Inter-process Communication**	Concurrent processes graphs, Critical Section, Race Conditions, Mutual Exclusion, Hardware Solution, Semaphores, Strict Alternation, Peterson's Solution, The Producer / Consumer Problem, Peterson's solution, Lamport Bakery solution, Semaphores, Test and Set operation Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem, Barber's shop problem, Inter Process Communication models and Schemes, Process generation.	**Lectures, PPTs and Smart Interactive Panel**	8L+4P	Assignment related to IPC and deadlock Program 16-Program 22	**CO2**
	Deadlock	Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery. Concurrent Programming: Critical region, conditional Critical region, Monitors, Concurrent languages, Communicating Sequential Process (CSP); Deadlocks - prevention, avoidance, detection and recovery.				
Unit 4	**Memory Management**	Memory Management: Background, Swapping, Contiguous and Non Contiguous memory allocation, Paging, Segmentation, Segmentation with paging. Virtual Memory: Background, Demand paging, Allocation of frames: First Fit, Best Fit, and Worst Fit, Page replacement algorithms (FCFS, Optimal, LRU), Balady's Anomaly, Thrashing	**Lectures, PPTs and Smart Interactive Panel**	8L+4P	Assignment related to Memory Management Program 23-Program 32	**CO4**

Unit 5	**Disc Scheduling**	Disk Scheduling: FCFS, SSTF, SCAN, C-SCAN, LOOK and C-LOOK	**Lectures, PPTs and Smart Interactive Panel**	8L+4P	Assignment related to File Management and administration Program 33-Program 48	**CO5** **CO3**
	File Management System	File Management: Concept and Organization, Access Methods, File System Implementation Directory Structures, Allocation Methods, Free Space Management, Secondary Storage Structure, File System Security and Protection				
	Linux administration	Linux Components, Shells, Installation of Linux, Virtualization: Definition, Types, Advantages, Virtualization tools. User Administration, Files: Type, Ownership, Permissions and manipulations Commands: Internal and External, Directory and File commands, I/O commands, Pipes, Filters, shell commands. Linux Tools Linux Networking Commands: ipconfig, traceroute, tracepath, ping, host, hostname, iwconfig. System Admin: man, uptime, users, service, pkill,ps				
	Shell Programing & VI Editor	Shell Programming - shell script features, shell variables, writing and executing a shell script, positional parameters.				
Total				**40L+20P=60**		
Text Books						
Sr. No.	**Book Details**					

1	*Operating System Concepts Essentials.* Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, Edition 8.
Reference Books	
Sr. No.	**Book Details**
1	Operating Systems: Internals and Design Principles. William Stallings, Edition 9.
2	Operating System: A Design-oriented Approach. Charles Patrick Crowley.
3	Operating Systems: A Modern Perspective. Gary J. Nutt.
4	Design of the Unix Operating Systems. Maurice J. Bach.
Links	
Unit 1	https://www.youtube.com/watch?v=783KAB-tuE4 https://www.youtube.com/watch?v=Bxx2_aQVeeg https://www.youtube.com/watch?v=ZaGGKFCLNc0 https://nptel.ac.in/courses/106/105/106105214/
Unit 2	https://www.youtube.com/watch?v=NShBeqTkXnQ https://www.youtube.com/watch?v=4hCih9eLc7M https://www.youtube.com/watch?v=9YRxhlvt9Zo
Unit 3	https://www.youtube.com/watch?v=UczJ7misUEk https://www.youtube.com/watch?v=_IxqinTs2Yo
Unit 4	https://www.youtube.com/watch?v=IwESijQs9sM https://www.youtube.com/watch?v=-orfFhvNBzY https://www.youtube.com/watch?v=2OobPx246zg&list=PL3-wYxbt4yCjpcfUDz-TgD_ainZ2K3MUZ&index=10
Unit 5	https://www.youtube.com/watch?v=AnGOeYJCv6s https://www.youtube.com/watch?v=U1Jpvni0Aak

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Subject Name: Database Management Systems	**L-T-P [3-0-0]**
Subject Code: BCSBS0404	**Applicable in Department: B.TECH. (CSBS)**
Prerequisite of Subject: The student should have basic knowledge of discrete mathematics and data structures.	
Course Objective: The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information in different databases.	

Course Outcome (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO 1	Analyze database used to solve real world and complex problem and design the ER, EER Model.	K3
CO2	Analyze and apply Structured Query Language (SQL) or Procedural Query Language (PL/SQL) to solve the complex queries. Implement relational model, integrity constraints..	K3
CO3	Design and implement database for storing, managing data efficiently by applying the Normalization process on the database.	K5
CO4	Synthesize the concepts of transaction management, concurrency control and recovery.	K5
CO5	Understand and implement the concepts of Database security and various types of databases.	K4

Syllabus						
Unit No	**Module**	**Topics Covered**	**Pedagogy**	**Lecture Required (T=L+P)**	**Aligned Practical/ Assignment/Lab**	**CO Mapping**
Unit 1	**Introduction**	Introduction to Database. Hierarchical, Network and Relational Models. Database system architecture: Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML). Data models: Entity-relationship model, Keys, Mapping constraints, network model, relational and object-oriented data models. Integrity constraints, data manipulation operations.	**Lectures, PPTs and Smart Interactive Panel**	8L+2P	Program 1- Program 2	CO1
Unit 2	**Relational query languages**	Relational query languages: Relational algebra, Tuple and domain relational calculus, SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQL server. Relational database design: Domain and data dependency, Armstrong's axioms, Functional Dependencies. Normalization: Normal forms, Normal Forms based on Functional Dependencies (1 NF, 2 NF, 3 NF, BCNF), Multivalued Dependencies (MVDs) and 4NF, Join	**Lectures, PPTs and Smart Interactive Panel**	6L+6P	Program 3- Program 4	CO2

		Dependencies (JDs) and 5NF and Domain Key, Normal Form (DKNF or 6NF), Inclusion Dependencies. Loss-Less Join Decompositions, Dependency preservation, Lossless design, Closure of an attribute set and FD sets, Canonical Cover of FD Sets.				
Unit 3	**Query processing and optimization**	Query processing and optimization: Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms Introduction on SQL: Characteristics of SQL, advantage of SQL. SQL data type 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, Triggers, Procedures in SQL/PL SQL. Storage strategies: Indices, B-trees, Hashing	**Lectures, PPTs and Smart Interactive Panel**	6L+4P	Program 5-Program 7	CO3
Unit 4	**Transaction processing**	Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp-based schedulers. Multi-version and optimistic, Concurrency Control schemes, Database recovery. Transaction system Testing of serializability, serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log-based recovery, checkpoints.	**Lectures, PPTs and Smart Interactive Panel**	6L+8P	Program 8	CO4

Unit 5	**Database Security**	Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection. Advanced topics: Object oriented and object relational databases, Distributed database Logical databases, Web databases, Distributed databases, Data warehousing and data mining. Definition of NoSQL, History of NoSQL and Different NoSQL products, Exploring Mongo DB, Interfacing and Interacting with NoSQL, NoSQL Storage Architecture, CRUD operations with MongoDB, Querying, Modifying and Managing NoSQL Data stores, Indexing and ordering datasets(MongoDB).	**Lectures, PPTs and Smart Interactive Panel**	8L+6P	Program 9-Program 10	CO5
Total				**35T+25L=60**		

Text Books

Sr. No.	**Book Details**
1	Korth, Silbertz, Sudarshan," Database System Concepts", Seventh Edition, McGraw – Hill.
2	Elmasri, Navathe, "Fundamentals of Database Systems", Seventh Edition, Addision Wesley.
3	Ivan Bayross "SQL, PL/SQL The programming language Oracle, Fourth Edition,BPB Publication

Reference Books

Sr. No.	Book Details
1	Thomas Cannolly and Carolyn Begg, “Database Systems: A Practical Approach to Design, Implementation and Management”, Third Edition, Pearson Education, 2007.
2	Raghu Ramakrishan and Johannes Gehrke “Database Management Systems” Third Edition, McGraw-Hill.
3	Ron Ben Natan “Implementing Database Security and Auditing” Digital Presss.
4	Brad Dayley “NoSQL with MongoDB in 24 Hours” First Edition, Sams Publisher.
Links	
Unit 1	https://www.youtube.com/watch?v=TlbJk78TqYY http://www.nptelvideos.com/lecture.php?id=6472 http://www.nptelvideos.com/lecture.php?id=6473
Unit 2	http://www.nptelvideos.com/lecture.php?id=6484 http://www.nptelvideos.com/lecture.php?id=6485 http://www.nptelvideos.com/lecture.php?id=6486 http://www.nptelvideos.com/lecture.php?id=6487
Unit 3	http://www.nptelvideos.com/lecture.php?id=6474 http://www.nptelvideos.com/lecture.php?id=6475 http://www.nptelvideos.com/lecture.php?id=6476 http://www.nptelvideos.com/lecture.php?id=6477
Unit 4	http://www.nptelvideos.com/lecture.php?id=6499 http://www.nptelvideos.com/lecture.php?id=6500 http://www.nptelvideos.com/lecture.php?id=6501
Unit 5	https://www.youtube.com/watch?v=n8anyniHbvI https://www.youtube.com/watch?v=meWQLWq7QSE http://www.nptelvideos.com/lecture.php?id=6519

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Subject Name: Software Design with UML	**L-T-P [2-0-0]**
Subject Code: BCSBS0402	**Applicable in Department: B.TECH. (CSBS)**
Prerequisite of Subject: Software Engineering concepts.	
Course Objective: Students will understand the importance of modeling in the software development life cycle. They can apply the object-oriented approach to analyze and design systems and software solutions. They will understand how to employ the UML notation to create effective and efficient system designs.	

Course Outcome (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO 1	Understand the object-oriented approach to analysing and designing systems and software solutions.	K2
CO2	Understand and become familiar with the Unified modelling Language	K2
CO3	Analyse the requirements through use case driven approach.	K4
CO3	Demonstrate the logical view of system using class diagram model.	K3
CO3	Develop the conceptual model into various scenarios and applications.	K6

Syllabus

Unit No	Module	Topics Covered	Pedagogy	Lecture Required (T=L+P)	Aligned Practical/Assignment/Lab	CO Mapping
Unit 1	**Software development process**	The Waterfall Model vs. The Spiral Model, The Software Crisis, description of the real world using the Objects Model, Classes, inheritance and multiple configurations, Quality software characteristics, Description of the Object-Oriented Analysis process vs. the Structure, Study of approaches Cord&Yordon, Graddy Booch, James Raumbaugh	Lecture	8L+4P	Assignment related to Development of software cycle Program 1- Program 6	**CO1**
Unit 2	**Introduction to the UML Language**	Standards, Elements of the language, General description of various models, The process of Object-Oriented software development, Design Patterns, and its types	Lecture	6L+6P	Assignment related to UML Language Program 7- Program 13	CO2
Unit 3	**Requirements Analysis Using Case Modeling**	Analysis of system requirements, Actor definitions. Writing a case goal, Use Case Diagrams, Use Case Relationships Interaction Diagrams: Description of goal, Defining UML Method, Operation, Object Interface, Class, Sequence Diagram, Collaboration Diagram.	Lecture	8L+4P	Assignment related to Case Modeling Program 14- Program 22	CO3

Unit 4	**The Logical View Design Stage**	Diagrams: The Class Diagram Model, Attributes descriptions, Operations descriptions, Connections descriptions in the Static Model, Association, Generalization, Aggregation,Dependency, Interfacing, and Multiplicity. Package Diagram Model: Description of the model: White box, black box, Connections between packagers. Interfaces. Create a Package Diagram.	Lecture	6L+6P	Assignment related to Logical View and design stage Program 23- Program 25	CO4
Unit 5	**Models**	Dynamic Model: State Diagram / Activity Diagram, Description of the State Diagram, Events Handling, Description of the Activity Diagram, Exercise in State Machines.Component Diagram Model: Physical Aspect. Logical Aspect, Connections and Dependencies, User face.Deployment Model: Processors, Connections, Components, Tasks, Threads, Signals and Events.	Lecture	6L+6P	Assignment related to Models diagrams Program 26- Program 29	CO5
Total				**34T+26L=60**		
Text Books						

Sr. No.	Book Details
1	The Unified Modelling Language User Guide. Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education, 2nd Edition.
2	Object-Oriented Software Engineering: using UML, Patterns, and Java. Bernd Bruegge and Allen H. Dutoit.
Reference Books	
Sr. No.	**Book Details**
1	Design Patterns: Elements of Reusable Object-Oriented Software. Erich Gamma, Richard Helm, Ralph Johnson, and John M. Vlissides.
Links	
Unit 1	https://nptel.ac.in/courses/106/105/106105224/
Unit 2	https://nptel.ac.in/courses/106/105/106105224/
Unit 3	https://www.youtube.com/watch?v=azTLDkiqGVk&list=PLbRMhDVUMngf8oZR3DpK MvYhZKga90JVt&index=37 https://www.youtube.com/watch?v=l9XFipXoJb0&list=PLbRMhDVUMngf8oZR3DpKMv YhZKga90JVt&index=15
Unit 4	https://www.youtube.com/watch?v=9KokDbcr6cM&list=PLbRMhDVUMngf8oZR3DpKMvYh ZKga90JVt&index=36 https://www.youtube.com/watch?v=7Pc5-birfmk&list=PLbRMhDVUMngf8oZR3DpKMvYhZKga90JVt&index=35
Unit 5	https://www.youtube.com/watch?v=sPORiupW4mw

NIET Greater Noida Autonomous Institute	**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY** **GREATER NOIDA-201306** **(An Autonomous Institute)** **School of Computer Science in Emerging Technologies**

Subject Name: Introduction to Innovation, IP Management and Entrepreneurship

L-T-P [2-0-0]

Subject Code: BCSBS0405 **Applicable in Department: B.TECH. (CSBS)**

Prerequisite of Subject: Good knowledge of Fundamentals of Management

Course Objective: This course is intended to inculcate the knowledge and application of innovation in business processes. This course would also make the students capable of identifying the opportunities and setting up entrepreneurial venture complying with prevailing intellectual property rights.

Course Outcome (CO)

Course Outcome: After completion of this course students will be able to		**Bloom's Knowledge Level (KL)**
CO 1	Understand the concept and importance of innovation in business.	K2
CO2	Apply the concepts of innovation in real world issues in order to create new ventures.	K3
CO3	Identify the entrepreneurial opportunities in order to secure competitive advantage of business.	K4
CO4	To analyze the available funding sources for financing the projects.	K5
CO5	To understand and apply the knowledge of IPRs in business.	K4

Syllabus

Unit No	Module	Topics Covered	Pedagogy	Lecture Required (L+P)	Aligned Practical/Assignment/Lab	CO Mapping
Unit 1 **Innovation**	**Module 1:** **Module 2:**	Innovation: What and why? Innovation as a core business process, Sources of innovation, Knowledge push vs. need pull innovations.	**PPTS/ VIDEOS/ CASE LETS**	4L+4P	Class Discussion- Is innovation manageable or just a random gambling activity?	**CO1**
Unit 2 **Building an Innovative Organization**	**Module 1:** **Module 2:**	Creating new products and services, Go- it- alone approach Exploiting open innovation and collaboration, Use of innovation for starting a new venture	**PPTS/ VIDEOS/ CASE LETS**	4L+4P	Class Discussion- Innovation: Co-operating across networks vs. 'go-it-alone' approach.	CO2
Unit 3 **Entrepreneurship**	**Module 1:** **Module 2:**	Opportunity recognition and entry strategies, Entrepreneurship as a Style of Management, Maintaining Competitive Advantage- Use of IPR to protect Innovation.	**PPTS/ VIDEOS/ CASE LETS**	4L+4P	Class Discussion- Innovation: Entrepreneurship and	CO3
Unit 4 **Financial Planning**	**Module 1:** **Module 2:**	Financial Projections and Valuation, Stages of financing, Debt, Venture Capital and other forms of Financing.	**PPTS/ VIDEOS/ CASE STUDIES**	4L+4P	Class Discussion- Innovation: Financial Planning approach.	CO4
Unit 5	**Module 1** **Module 2:**	Introduction and the economics behind the development of IPR: Business Perspective, IPR in India – Genesis and Development, International Context, Concept of IP Management, Use in	**PPTS/ VIDEOS/ CASE STUDIES**	4L+4P	Class Discussion- IPR	CO5

Intellectual Property Rights (IPR)	**Module 3:**	marketing. Types of Intellectual Property Patent- Procedure, Licensing and Assignment, Infringement and Penalty, Trademark- Use in marketing, example of trademarks- Domain name, Geographical Indications- What is GI, why protect them? Copyright- What is copyright? Industrial Designs- What is design? How to protect?				
Total				**20T+20P=40**		

Text Books	
Sr. No.	**Book Details**
1	Joe Tidd, John Bessant. Managing Innovation: Integrating Technological, Market and Organizational Change

Reference Books	
Sr. No.	**Book Details**
1	Case Study Materials: To be distributed for class discussion

Links	
Unit 1	https://nptel.ac.in/courses/106/105/106105224/
Unit 2	https://nptel.ac.in/courses/106/105/106105224/

Unit 3	https://www.youtube.com/watch?v=azTLDkiqGVk&list=PLbRMhDVUMngf8oZR3DpK MvYhZKga90JVt&index=37 https://www.youtube.com/watch?v=l9XFipXoJb0&list=PLbRMhDVUMngf8oZR3DpKMv YhZKga90JVt&index=15
Unit 4	https://www.youtube.com/watch?v=9KokDbcr6cM&list=PLbRMhDVUMngf8oZR3DpKMvYh ZKga90JVt&index=36 https://www.youtube.com/watch?v=7Pc5-birfmk&list=PLbRMhDVUMngf8oZR3DpKMvYhZKga90JVt&index=35
Unit 5	https://www.youtube.com/watch?v=sPORiupW4mw

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Subject Name: Business Communication & Value Science - III	**L-T-P [3-0-0]**
Subject Code: BCSBS0407	**Applicable in Department: B.TECH. (CSBS)**
Pre-Understanding/Requirement of Subject: Basic Knowledge of English (verbal and written) and Completion of all units from Semester 1, and 2	

Course Objective:

- Develop technical writing skills
- Introduce students to Self-analysis techniques like SWOT & TOWS
- Introduce students to key concepts of:
  - A. Pluralism & cultural spaces
  - B. Cross-cultural communication
  - C. Science of Nation building.

Unit	Module	Topics Covered	Pedagogy	Lecture Required (T=L+P) (clearly mention the hours for theory and lab)	Practical/ Assignment/Lab	CO Mapping	Aligned with university/industry/certifications

1	**Module 1:** **Module 2:** **Module 3:** **Module 4:**	**FYI- For Your Introspection** Summarize the basic principles of SWOT and life positions. Apply SWOT in real life scenarios. Recognize how motivation helps real life. Leverage motivation in real-life scenarios.	Interactive and Activity Based	7		CO1	ALL
2	**Module 1:** **Module 2:** **Module 3:**	**Culture and Stereotypes** Identify and respect pluralism in cultural spaces. Differentiate between the different cultures of India.	Interactive and Activity Based	8		CO2	ALL

	Module 4:	Define and differentiate between global, glocal and trans locational culture. ➢ Recognize the implications of cross-cultural communication. ➢ Identify the common mistakes made in cross-cultural communication. ➢ Apply cross-cultural communication.					
5	**Module 1**	Project	Interactive and Activity Based	10		CO5	ALL

Total= 40 Hours

Textbooks: There are no prescribed texts for Semester IV – there will be handouts and reference links shared.
○ Examples of Technical Writing for Students https://freelance-writing.lovetoknow.com/kinds-technical-writing ○ 11 Skills of a Good Technical Writer https://clickhelp.com/clickhelp-technical-writing-blog/11-skills-of-a-good-technicalwriter/ • 13 benefits and challenges of cultural diversity in the workplace https://www.hult.edu/blog/benefits-challenges-cultural-diversity-workplace/

Links:
https://youtu.be/CsaTslhSDI
https://m.youtube.com/watch?feature=youtu.be&v=IIKvV8_T95M
https://m.youtube.com/watch?feature=youtu.be&v=e80BbX05D7Y https://m.youtube.com/watch?v=dT_D68RJ5T8&feature=youtu.be https://m.youtube.com/watch?v=7sLLEdBgYYY&feature=youtu.be

1. Interview questions asked by various companies:

   Some frequently asked questions -

   - Can you discuss a recent project you worked on that demonstrates your problem-solving skills?
   - How do you stay updated with the latest technological advancements in your field?

- Can you explain a complex technical concept in your area of expertise to someone without a technical background?
- Describe a situation where you had to collaborate with a multidisciplinary team to achieve a common goal. What was your role, and how did you contribute?
- What programming languages or software tools are you proficient in, and how have you used them in your previous projects?
- Have you ever faced a challenging technical problem during a project? How did you approach it and what was the outcome?
- How do you prioritize tasks when working on multiple projects simultaneously?
- Describe a time when you had to adapt to a new technology or methodology quickly. How did you manage the transition?
- Can you discuss a situation where you had to communicate complex technical information to a non-technical stakeholder or client? How did you ensure understanding?
- What do you consider to be the most significant technological trend in your field, and how do you think it will impact future projects?
- Have you ever encountered a situation where a project did not go as planned? How did you handle it, and what did you learn from the experience?
- How do you approach debugging and troubleshooting when encountering technical issues in your projects?
- Can you discuss a time when you had to make a critical decision under pressure during a project? How did you arrive at your decision, and what was the outcome?
- In what ways do you ensure the quality and reliability of your work in engineering or technical projects?
- How do you stay motivated and maintain productivity when faced with long and challenging engineering tasks or projects?

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
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Subject Name: Operations Research	**L-T-P [2-0-0]**
Subject Code: BCSBS0401	**Applicable in Department: B.TECH. (CSBS)**
Prerequisite of Subject: Statistics and Probability	
Course Objective: To introduce mathematical foundations of computation including automata theory, provide the design concepts of abstract computation model of finite automata, push down automata and Turing Machine and familiarize the notions of algorithm, decidability, complexity, and computability.	

Course Outcome (CO)

Course Outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO 1	Understand the characteristics of different types of decision-making environments and the appropriate decision-making approaches and tools to be used in each type.	K1, K3
CO2	Formulate linear programming problem and to find optimal solution by graphical simplex method.	K1, K3
CO3	Solve Transportation Models and Assignment Models.	K3
CO4	Apply project management concepts like CPM, PERT and inventory Control to reduce cost and time	K2
CO5	Understand the concept of Simulation Methodology.	K3

Syllabus						
Unit No	**Module**	**Topics Covered**	**Pedagogy**	**Lecture Required (L+P)**	**Aligned Practical/ Assignment/Lab**	**CO Mapping**
Unit 1	**Introduction to Operations Research**	Origin of OR and its definition. Concept of optimizing performance measure, Types of OR problems, Deterministic vs. Stochastic optimization, Phases of OR problem approach – problem formulation, building mathematical model, deriving solutions, validating model, controlling, and implementing solution.	**Class room Teaching, Smart Board, PPT, M-tutor.**	8L	Program 1- Program 2	**CO1**
Unit 2	**Linear Programming**	Linear programming – Examples from industrial cases, formulation & definitions, Matrix form. Implicit assumptions of LPP. Some basic concepts and results of linear algebra – Vectors, Matrices, Linear Independence/Dependence of vectors, Rank, Basis, System of linear eqns., Hyperplane, Convex set, Convex polyhedron, Extreme points, Basic feasible solutions. Geometric method: 2-variable case, Special cases – infeasibility, unboundedness, redundancy & degeneracy, Sensitivity analysis. Simplex Algorithm – slack, surplus & artificial variables, computational details, big-M method, Two Phase method, identification and resolution of special cases through simplex iterations. Duality – formulation, results, fundamental theorem of duality, dual-simplex.	**Class room Teaching, Smart Board, PPT, M-tutor.**	8L	Program 3- Program 4	CO2
Unit 3	**Transportation**	TP - Examples, Definitions – decision variables, supply & demand constraints, formulation, Balanced & unbalanced situations, Solution methods – NWCR,	**Class room Teaching, Smart Board, PPT, M-**	8L	Program 5- Program 6	CO3

	and Assignment problems	minimum cost and VAM, test for optimality (MODI method), degeneracy and its resolution. AP - Examples, Definitions – decision variables, constraints, formulation, Balanced & unbalanced situations, Solution method – Hungarian Method.	**tutor.**			
Unit 4	**PERT – CPM and Inventory Control**	PERT – CPM: Project definition, Project scheduling techniques – Gantt chart, PERT & CPM, Determination of critical paths, Estimation of Project time and its variance in PERT using statistical principles, Concept of project crashing/time-cost trade-off. Inventory Control: Functions of inventory and its disadvantages, Concept of inventory costs, Basics of inventory policy (order, lead time, types), Fixed order-quantity models – EOQ (only Deterministic model).	**Class room Teaching, Smart Board, PPT, M-tutor.**	8L	Program 7-Program 8	CO4
Unit 5	**Simulation Methodology**	Simulation Methodology: Definition and steps of simulation, random number, random number generator, Discrete Event System Simulation – clock, event list, Applications of simulation	**Class room Teaching, Smart Board, PPT, M-tutor.**	8L	Program 9-Program 10	CO5
Total				**40L**		
Text Books						
Sr No	**Book Details**					
1.	Operations Research: An Introduction. H.A. Taha.					
Reference Books						

Sr No	Book Details
1.	Linear Programming. K.G. Murthy.
2.	Linear Programming. G. Hadley.
3.	Principles of OR with Application to Managerial Decisions. H.M. Wagner.
Links	
UNIT 1	https://www.youtube.com/watch?v=Q2dewZweAtU https://www.youtube.com/watch?v=cyGxWC4mjtE https://www.youtube.com/watch?v=IXN-wIpSTlk https://www.youtube.com/watch?v=dAhiPu3mY9c
UNIT 2	https://youtu.be/M8POtpPtQZc https://youtu.be/8IRrgDoV8Eo https://youtu.be/YrsbJG8XqU0 https://www.youtube.com/watch?v=aPZ1B7DAXPw https://www.youtube.com/watch?v=eDXztJ6fgqY
UNIT 3	https://youtu.be/oE2nJTXC8OM https://youtu.be/82s6vjg-vhg https://youtu.be/j58TUy0d9R4 https://www.youtube.com/watch?v=Bt9IG9TTXZI https://www.youtube.com/watch?v=zN4AE1YjE2I https://www.youtube.com/watch?v=KarLMGILAjc
UNIT 4	https://www.youtube.com/watch?v=WrAf6zdteXI https://www.youtube.com/watch?v=JxnPBrNccqY https://www.youtube.com/watch?v=J1WwNKDdDC0 https://www.youtube.com/watch?v=v2FT9PoFJ9Y https://www.youtube.com/watch?v=9qnLpjpnsuQ
UNIT 5	https://www.youtube.com/watch?v=v5ZfvATEoDY https://www.youtube.com/watch?v=KG-SxYrMr4Y https://www.youtube.com/watch?v=Co4wzABsny8 https://www.youtube.com/watch?v=6uBb_eOmta8 https://www.youtube.com/watch?v=oJyf8Q0KLRY

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREATER NOIDA-201306
(An Autonomous Institute)
School of Computer Science in Emerging Technologies

Subject Name: Marketing Research & Marketing Management	**L-T-P [2-0-0]**
Subject Code: BCSBS0406	**Applicable in Department: B.TECH. (CSBS)**
Prerequisite of Subject: Good knowledge of Fundamentals of Marketing Management	
Course Objective: This course will develop the orientation of applying research tools in marketing management concepts. This would further facilitate the understanding and application of modern marketing principles and practices in real world issues.	

Course Outcome (CO)

Course Outcome: After completion of this course students will be able to		**Bloom's Knowledge Level (KL)**
CO 1	Understand basic marketing concepts.	K1
CO2	Comprehend the dynamics of marketing and analyze how its various components interact with each other in the real world.	K4
CO3	Leverage marketing concepts for effective decision making.	K3
CO4	Understand basic concepts and application of statistical tools in Marketing Research.	K3
CO5	Understand and apply the Internet and B2B marketing for promoting the business.	K3

Syllabus						
Unit No	**Module**	**Topics Covered**	**Pedagogy**	**Lecture Required (L+P)**	**Aligned Practical/Assignment/Lab**	**CO Mapping**
Unit 1 **Marketing Concepts and Applications**	**Module 1:** **Module 2:** **Module 3:**	Overview of Marketing Core Concepts in Marketing (Needs, Wants, Demand, Value, Exchange, etc.) Marketing of Services Importance of Marketing in the Service Sector Marketing Planning Process - Elements of Marketing Mix (Product, Price, Place, Promotion) Analyzing Needs & Trends in the Marketing Environment Determinants of Consumer Behavior Factors Influencing Consumer Behavior (Psychological, Social, Cultural, Situational) Market Research and Consumer Insights Meaning & Concept of Market Segmentation Basis of Segmentation (Geographic, Demographic, Psychographic, Behavioral) Selection of Target Segments Differentiation and Positioning Target Marketing Strategies (Undifferentiated, Differentiated, Concentrated, Micromarketing) Product Positioning Strategies	**PPTS/ VIDEOS/ CASE LETS**	8L	Class Discussion- Is innovation manageable or just a random gambling activity?	**CO1**
Unit 2	**Module 1:**	Overview of Product Lifecycle Management (PLM) Understanding the Product Lifecycle Stages	**PPTS/ VIDEOS/ CASE LETS**	8L	Assignment related to	CO2

Product Management	**Module 2:** **Module 3:**	(Introduction, Growth, Maturity, Decline) Importance of Managing Product Lifecycles for Business Success Importance of New Product Development (NPD) in Business Growth Strategies for Identifying New Product Opportunities Innovation and Creativity in NPD Risk Management in New Product Development Stages in New Product Development Product Decision and Strategies Branding & Packaging Importance of Branding in Product Management Brand Equity and Brand Loyalty Brand Identity, Image, and Personality Packaging Design and its Role in Product Marketing			Product Management	
Unit 3 **Pricing, Promotion and Distribution Strategy**	**Module 1:** **Module 2:**	Overview of Pricing Methods (Cost-based, Value-based, Competition-based) Price Determination Policies (Skimming, Penetration, Psychological Pricing, etc.) Introduction to Marketing Communication Components of the Promotion Mix (Advertising, Sales Promotion, Public Relations, Personal Selling, Direct Marketing) Advertising & Publicity 5 M's of Advertising Management Marketing Communication in Retailing	**PPTS/ VIDEOS/ CASE LETS**	8L		CO3

Unit 4 **Marketing Research**	**Module 1:** **Module 2:**	Marketing Research Exploring different types of market research (qualitative vs. quantitative, primary vs. secondary, etc.) Understanding the scope and applications of market research in business decision-making Marketing Research Techniques Survey Questionnaire Design and Drafting Pricing Research Media Research Statistical Tools in Marketing Research	**PPTS/ VIDEOS/ CASE STUDIES**	8L	Class Discussion- on Marketing Research	CO4
Unit 5 **Internet Marketing**	**Module 1** **Module 2:** **Module 3:**	Understanding the evolution and significance of internet marketing Exploring key concepts such as digital marketing, online presence, and e-commerce Fundamental Concepts of Marketing in the Digital Age Strategy and Planning for Internet Marketing Fundamentals of Business Markets Exploring the stages of the organizational buying process Analyzing factors that influence business buying decisions Business Buyer Needs and Market/Sales Potential Product Strategies in Business Markets Pricing Strategies in Business Markets Distribution (Place) Strategies in Business Markets Relationship Management and Networks in B2B Marketing	**PPTS/ VIDEOS/ CASE STUDIES**	8L	Class Discussion- Major Court battles regarding violation of patents between corporate companies.	CO5

Total	40L

Text Books

Sr No	Book Details
1.	Describe a situation where you had to work collaboratively with a cross-functional team to achieve marketing objectives.
2.	How do you stay updated with market trends and consumer behaviour to inform your marketing strategies?
3.	Describe a situation where a marketing initiative didn't perform as expected. How did you analyse the situation and make improvements?

Reference Books

Sr No	Book Details
1.	Marketing Management – Rajan Saxena
2.	Marketing Management – S.A. Sherlekar
3.	Service Marketing – S.M. Zha
4.	Journals – The IUP Journal of Marketing Management, Harvard Business Review
5.	Research for Marketing Decisions by Paul Green, Donald, Tull

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY GREATER NOIDA-201306

(An Autonomous Institute)

School of Computer Science in Emerging Technology

Subject Name:	**Operating Systems Lab**	**L-T-P [0-0-2]**
Subject Code:	**BCSBS0453**	**Applicable in Department: B.Tech(CSBS)**

Lab Practicals

Course Objective: This course gives an ability to students to construct codes for OS API and basics of OS mechanisms and Hands-on and practical experience with usage of the Linux OS and basics of OS Shell Programming.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to		**Bloom's Knowledge Level(KL)**
CO1	Implement and manage process synchronization and deadlock handling mechanisms.	K3
CO2	Design and execute memory management techniques, including paging and segmentation.	K6
CO3	Develop and evaluate file and input/output management systems.	K5

List of Practical's

Sr. No.	**Program Title**	**CO Mapping**

1	Implement FCFS CPU Scheduling algorithm.	CO1
2	Implement the given CPU Scheduling algorithm a) SJF b) Priority Based	CO1
3	Implement Multi-level Queue CPU Scheduling algorithm.	CO1
4	Implement PRIORITY CPU Scheduling Algorithm (For both Pre-emptive and non-pre-emptive).	CO1
5	Implement Round-Robin CPU Scheduling Algorithm	CO1
6	Implement Multilevel Queue CPU Scheduling Algorithm.	
7	Execute the RACE Condition of Process Synchronization.	CO2
8	Implement the Producer–consumer problem using semaphores.	CO2
9	Design a code and implement the Dinning Philosopher problem	CO2
10	Execute an algorithm for deadlock detection.	CO2
11	Implement Banker's algorithm of Deadlock Avoidance	CO2
12	Implement Contiguous memory fixed size partition scheme.	CO1
13	Implement Contiguous memory variable size partition scheme.	CO2
14	Simulate the First-Fit contiguous memory allocation technique.	CO2
15	Simulate the Best-Fit contiguous memory allocation technique.	CO2
16	Simulate the Worst-Fit contiguous memory allocation technique.	CO2
17	Implement the Non Continuous Memory Allocation by using Paging.	CO2
18	Write a Program to simulate the FIFO page replacement algorithm.	CO2
19	Write a Program to simulate the LRU page replacement Algorithm.	CO2
20	Write a Program to simulate the Optimal page replacement Algorithm.	CO2
21	Write a Program to simulate the FCFS Disk Scheduling Algorithm.	CO2
22	Write a Program to simulate the SSTF Disk Scheduling Algorithm.	CO2

23	Implement SCAN and C-SCAN Disk Scheduling Algorithms.	CO3
24	Implement LOOK and C-LOOK Disk Scheduling Algorithms.	CO3
25	Design an algorithm and implement to organize the file using the single-level directory.	CO3
26	Write a program to organize the file using two-level directories.	CO3
27	Write a C program to Sequential files for processing the student information.	CO3
28	Write a C program for random access files for processing the employee details.	CO3
29	Execute Various types of Linux Commands (Miscellaneous, File oriented, Directory oriented)	CO3
30	Execute a shell program, which accepts the name of a file from standard input and performs the File Readable test on it.	CO3
31	Design and execute the code to accept the name of a file from standard input and performs the File Writable test on it.	CO3
32	Implement a shell program, which accepts the name of a file from standard input and performs the File Writable test on it.	CO3
33	Case Study 1: design the code and execute the commands as per given instructions in CS.	CO3
34	Case Study 2: design the code and execute the commands as per given instructions in CS.	CO3
35	Implement Linux Networking Commands: ipconfig, traceroute, tracepath, ping, host, hostname, iwconfig.	CO3
36	Implement the following system admin commands in Linux: man, uptime, users, service, pkill, ps.	CO3
37	Implement the following in Unix:	CO3

38	a) Process creation, b) Sleep Command c) Sleep command using getpid.	CO3
39	Analyse system calls of unix operating system (fork and exit)	CO3
40	Implement Unix commands for a) Signal handling using kil, b) Wait command, c)top	CO3
41	Write a program to simulate UNIX commands like cp, ls, and grep.	CO3
42	Implement Unix Shell programming for concatenation of two strings.	CO3
43	Implement Unix Shell programming for a) Comparison of two strings b) Maximum of three numbers.	CO3
44	Implement Unix Shell programming for Fibonacci series	CO3
45	Write a program in Unix to whether the given year is a) a leap year or not b) Arithmetic operation using cases.	CO3
46	Write a program in Unix for factorial of a number.	CO3
47	Write a program in Unix to swap the two integers	CO3
48	Write a program in Unix to whether the given number is prime or not.	CO3
Required Software and Tools		
1.	C, Unix, & Python	

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY GREATER NOIDA-201306

(An Autonomous Institute)

School of Computer Science in Emerging Technology

Subject Name: Database Management Systems Lab	**L-T-P [0-0-2]**
Subject Code: BCSBS0454	**Applicable in Department: CSBS**

Lab Practicals

Course Objective: Students are able to understand the fundamental concepts of database management systems (DBMS) and apply them to design and implement database solutions, including database modeling, querying, and normalization.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO1	Design and implement the ER and EER model to solve real-world problems. Transform an information model into a relational database schema and utilize data effectively.	K4
CO2	Formulate and evaluate queries using SQL to solve a broad range of query and data update problems..	K4
CO3	Apply and create PL/SQL blocks, procedures, functions, packages, triggers, and cursors. Analyze entity integrity, referential integrity, key constraints, and domain constraints on a database.	K4

List of Practical's

Sr. No.	**Program Title**	**CO**

		Mapping
1	Creating Entity-Relationship Diagram using case tools with Identifying (entities, attributes, keys and relationships between entities, cardinalities, generalization, specialization etc.)	CO1
2	I. Implement DDL commands –Create, Alter, Drop etc. II. Implement DML commands- Insert, Select, Update, Delete	CO1
3	I. Implement DCL Commands-Grant and Revoke	CO1
4	II. Implement TCL commands- Rollback, Commit, Save point	CO2
5	Practice Queries using COUNT, SUM, AVG, MAX, MIN, GROUP BY, HAVING, VIEWS Creation and Dropping.	CO2
6	Practicing Queries using ANY, ALL, IN, EXISTS, NOT EXISTS, UNION, INTERSECT, CONSTRAINTS etc.	CO3
7	Practicing Sub queries (Nested, Correlated) and Joins (Inner, Outer and Equi).	CO3
8	Practicing on Triggers - creation of trigger, Insertion using trigger, Deletion using trigger, Updating using trigger	CO3
9	Procedures- Creation of Stored Procedures, Execution of Procedure, and Modification of Procedure.	CO3
10	Cursors- Declaring Cursor, Opening Cursor, Fetching the data, closing the cursor.	CO3
11	Study of Open Source NOSQL Database: MongoDB (Installation, Basic CRUD operations, Execution) Design and Develop MongoDB Queries using CRUD operations. (Use CRUD operations, SAVE method, logical operators)	CO3
Required Software and Tools		
1.	SQL, MongoDB, Oracle.	

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREATER NOIDA-201306
(An Autonomous Institute)
School of Computer Science in Emerging Technology

Subject Name:	**Software Design with UML Lab**	**L-T-P [0-0-2]**
Subject Code:	**BCSBS0452**	**Applicable in Department: CSBS**

Lab Practicals

Course Objective: Students are able to learn and apply UML modeling techniques for software design, including conceptual modeling, structural and behavioral diagrams, and system documentation, in the context of software development projects.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO1	Identify ambiguities, inconsistencies, and incompleteness in a requirements specification, and articulate functional and non-functional requirements.	K3
CO2	Identify classes and their associations, and draw class diagrams. Graphically represent various UML diagrams, including associations, and depict the logical sequence of activities in a system.	K4
CO3	Apply UML modeling techniques to design and develop software systems. Emphasize conceptual modeling, structural and behavioral diagrams, and system documentation.	K4

List of Practical's

Sr. No.	**Program Title**	**CO**

		Mapping
1	Use Case Diagram	CO1
2	Use Case Diagram for ATM	CO1
3	Use Case Diagram for Stock Maintenance System	CO1
4	Use Case Diagram for Remote Procedure Call	CO1
5	Class Diagram	CO3
6	Class Diagram for ATM	CO3
7	Class Diagram for Stock Maintenance System	CO3
8	Object Diagram	CO3
9	Object Diagram for ATM	CO3
10	Object Diagram for Stock Maintenance System	CO3
11	Sequence Diagram	CO3
12	Sequence Diagram for ATM	CO3
13	Sequence Diagram for Stock Maintenance System	CO3
14	Collaboration Diagram	CO3
15	Collaboration Diagram for ATM	CO3
16	Collaboration Diagram for Stock Maintenance System	CO3
17	Collaboration Diagram for Remote Procedure Call	CO3
18	State Chart Diagram	CO3
19	State Chart Diagram for ATM	CO3
20	State Chart Diagram for Stock Maintenance System	CO3
21	Activity Diagram	CO3
22	Activity Diagram for ATM	CO3

23	Activity Diagram for Stock Maintenance System	CO3
24	Component Diagram	CO3
25	Component Diagram for ATM	CO3
26	Component Diagram for Stock Maintenance System	CO3
27	Deployment Diagram	CO3
28	Deployment Diagram for ATM	CO3
29	Deployment Diagram for Stock Maintenance System	CO3
Required Software and Tools		
1.	Paid/Unpaid-Unpaid : Star UML	

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY GREATER NOIDA-201306

(An Autonomous Institute)

School of Computer Science in Emerging Technology

Subject Name: Operations Research Lab	**L-T-P [0-0-2]**
Subject Code: BCSBS0451	**Applicable in Department: B.Tech(CSBS)**

Lab Practicals

Course Objective: The course objective of the Operations Research Lab is to equip students with practical skills in applying optimization techniques and analytical methods to solve complex decision-making problems in various operational scenarios.

Course Outcomes (CO)

Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level(KL)**
CO1	Analyze the characteristics of different types of decision-making environments and the appropriate decision-making approaches and tools to be used in each type.	K4
CO2	Formulate linear programming problem and to find optimal solution by graphical simplex method.	K3
CO3	Solve Transportation Models and Assignment Models.	K3

List of Practical's

Sr. No.	**Program Title**	**CO Mapping**
1	Formulation of linear programming problems.	CO1, CO2
2	Solution of linear programming problem using graphical method with:	CO1, CO2

	Multiple constraints Unbounded solution Infeasible solution Alternative or multiple solution	
3	Enumeration of all basic solutions for linear programming problem.	CO1, CO2
4	Solution of linear programming problem with simplex method.	CO1, CO2
5	Problem solving using Big M method.	CO1, CO2
6	Problem solving using two phase method.	CO1, CO2
7	Solution on primal problem as well as dual problem.	CO1, CO2
8	Solution based on dual simplex method.	CO1, CO2
9	Solution of transportation problem.	CO3
10	Solution of assignment problem.	CO3
Required Software and Tools		
1.	Arduino IDE (Open Source)	
2.	Blynk App (Limited Open Source)	
3.	Thing speak cloud (Limited Open Source)	

NIET Greater Noida Autonomous Institute	**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY** **GREATER NOIDA-201306** **(An Autonomous Institute)** **School of Computer Science in Emerging Technologies**

Subject Name: Essence of Indian Traditional Knowledge		**L-T-P [2-0-0]**
Subject Code: BNC0404		**Applicable in Department: B.TECH. (CSBS)**
Prerequisite of Subject: This course aims to provide basic knowledge about different theories of society, state and polity in India, Indian literature, culture, Indian religion, philosophy, science, management, cultural heritage, and different arts in India.		
Course Objective: This course aims to provide basic knowledge about different theories of society, state and polity in India, Indian literature, culture, Indian religion, philosophy, science, management, cultural heritage, and different arts in India.		
Course Outcome (CO)		
Course outcome: After completion of this course students will be able to:		**Bloom's Knowledge Level (KL)**
CO 1	Understand the basics of past Indian politics and state polity.	K2
CO2	Understand the Vedas, Upanishads, languages & literature of Indian society.	K2
CO3	Know the different religions and religious movements in India.	K4
CO4	Identify and explore the basic knowledge about the ancient history of Indian agriculture, science & technology, and Ayurveda.	K4
CO5	Identify Indian dances, fairs & festivals, and cinema.	K1
Syllabus		

Unit No	Module	Topics Covered	Pedagogy	Lecture Required (T=L+P)	Aligned Practical/Assignment/Lab	CO Mapping
Unit 1 **Society State and Polity in India**	**Introduction to theories of State in Ancient India**	Evolutionary Theory, Force Theory, Mystical Theory Contract Theory, Stages of State Formation in Ancient India, Kingship , Council of Ministers Administration Political Ideals in Ancient India Conditions' of the Welfare of Societies.	**Discussion with PPTs, videos**	3L	Assignment 1 briefly introduce India's social diversity – religion, language, ethnicity, caste system, etc. Assignment 2 Summarize the key points about the relationship between society, state, and polity in India.	**CO1**
	Introduction to stages of human life	The Seven Limbs of the State, Society in Ancient India, Purusārtha, Varnāshrama System, Āshrama or the Stages of Life, Marriage, Understanding Gender as a social category, The representation of Women in Historical traditions, Challenges faced by Women. Four-class Classification, Slavery.	**Discussion with PPTs**	3L		
Unit 2 **Indian Literature, Culture, Tradition, and Practices**	**Evolution of script and languages in India**	Evolution of script and languages in India: Harappan Script and Brahmi Script. The Vedas, the Upanishads, the Ramayana and the Mahabharata, Puranas, Buddhist And Jain Literature in Pali, Prakrit And Sanskrit, Kautilya's Arthashastra	**Discussion with PPTs and Class presentation**	6L	Assignment briefly introduce the vastness and antiquity of Indian literature. Discuss the major languages (Sanskrit, Tamil, Hindi, etc.) and their literary contributions. Assignment discuss the significant literary forms like	**CO2**
	Introduction to various	Famous Sanskrit Authors, Telugu Literature, Kannada Literature, Malayalam Literature,	**Discussion with PPTs**	4L		

	authors in various languages	Sangama Literature Northern Indian Languages & Literature, Persian And Urdu ,Hindi Literature.	**and Class presentation**		epics (Ramayana, Mahabharata), poetry (ghazals, bhakti poetry), and drama (Sanskrit plays).	
Unit 3 **Indian Religion, Philosophy, and Practices**	**Introduction to Pre-Vedic and Vedic Religion**	Pre-Vedic and Vedic Religion, Buddhism, Jainism, Six System Indian Philosophy, Shankaracharya, Various Philosophical Doctrines, Other Heterodox Sects.	**Discussion with PPTs and Videos**	4L	Assignment briefly introduce the concept of Dharma and its centrality in Indian religious and philosophical traditions. pen_spark	**CO3**
	Bhakti Movement	Bhakti Movement, Sufi movement, Socio religious reform movement of 19th century, Modern religious practices.	**Discussion with PPTs and Videos**	4L		
Unit 4 **Science, Management and Indian Knowledge System**	**Astronomy in India**	Astronomy in India, Chemistry in India, Mathematics in India, Physics in India, Agriculture in India, Medicine in India, Metallurgy in India, Geography, Biology	**Discussion with PPTs and Videos**	4L	Assignment highlight some key scientific advancements from ancient India, such as contributions to mathematics (zero, decimal system), medicine (Ayurveda), and astronomy etc.	**CO4**
	Harappan Technologies	Harappan Technologies, Water Management in India, Textile Technology in India, Writing Technology in India Pyrotechnics in India Trade in Ancient India/India's Dominance up to Pre-colonial Times.	**Discussion with PPTs and Videos**	4L		
Unit 5	**Indian Architect**	Indian Architect, Engineering and Architecture in Ancient India, Sculptures, Seals, coins, Pottery, Puppetry, Dance, Music, Theatre, drama, Painting	**Discussion with PPTs and Videos.**	2L	Assignment briefly define cultural heritage and its significance in preserving a nation's identity. Discuss the	**CO5**

Cultural Heritage and Performing Arts	**Indian's Cultural Contribution to the World.**	Martial Arts Traditions, Fairs and Festivals, Current developments in Arts and Cultural, Indian's Cultural Contribution to the World. Indian Cinema	**Discussion with PPTs and Videos.**	2L	various elements of India's cultural heritage.	
Total				**36L**		

Text Books

Sr No	Book Details
1.	Sivaramakrishna (Ed.), Cultural Heritage of India-Course Material, Bharatiya Vidya Bhavan, Mumbai, 5th Edition,
2.	S. Baliyan, Indian Art and Culture, Oxford University Press, India
3.	Sharma, R.S., Aspects of Political Ideas and Institutions in Ancient India(fourth edition), Delhi, Motilal Banarsidass,

Reference Books

Sr No	Book Details
1.	Romila Thapar, Readings In Early Indian History Oxford University Press , India
2.	Basham, A.L., The Wonder that was India (34th impression), New Delhi, Rupa & co.