Detailed Syllabus
Lecture-wise Breakup

Subject Code	15B11CI411	**Semester: Even (specify Odd/Even)**	**Semester** IV **Session** 2023 -2024 **Month from:** Jan 2024 to June 2024
Subject Name	Algorithms and Problem Solving		
Credits	**3**	**Contact Hours**	**3**

Faculty (Names)	**Coordinator(s)**	Anita Sahoo (J62), Rajiv Mishra (J128)
	Teacher(s) (Alphabetically)	J62 – Anita Sahoo, Deepika Varshney, Manish Kumar Thakur, Sherry Garg, Tribhuwan Kumar Tewari, Vivek Kumar Singh J128–Krishna Asawa, Neeraj Jain, Prakhar Mishra, Pulkit Mehndiratta, Rajiv Mishra

COURSE OUTCOMES		**COGNITIVE LEVELS**
C214.1	Demonstrate a familiarity of complexity classes, the notion of algorithm, asymptotic analysis, and problem solving approaches.	Understand Level (Level 2)
C214.2	Apply a standard algorithm for solving fundamental problems such as sorting, searching, and graph based problems.	Apply Level (Level 3)
C214.3	Analyze and identify an appropriate data structure and/or algorithm design strategy for a given problem.	Analyze Level (Level 4)
C214.4	Design an efficient algorithm to solve a given problem.	Create Level (Level 6)

Module No.	**Subtitle of the Module**	**Topics in the Module**	**No. of Lectures**
1.	Introduction	Introduction to problem solving approach; Asymptotic Analysis: Growth of Functions and Solving Recurrences; Notations- Big O, big omega, big theta, little o; Empirical analysis of sorting and searching algorithms – Merge sort, Quick sort, Heap sort, Radix sort, Count sort, Binary search, and Median search	7
2.	Design Technique: Divide and Conquer	Fundamentals of Divide and Conquer (D&C) approach using Binary search, Quick sort, and Merge sort; Strassen's matrix multiplication; and Closest pair, etc.	3
3.	Design Technique: Greedy Algorithms	Introduction to greedy based solution approach; Minimum Spanning Trees (Prim's and Kruskal algorithms); Shortest Path using Dijkstra's algorithm; Fractional and 0/1 Knapsack; Coinage problem; Bin packing; Job scheduling – Shortest job first, Shortest remaining job first, etc.; Graph coloring; and Text compression using Huffman coding and Shannon-Fanon coding, etc.	6
4.	Design Technique: Backtracking Algorithms	Review of backtracking based solution approach using N queen, and Rat in a maze; M-coloring problem; Hamiltonian Cycle detection; Travelling salesman problem; Network flow	6
5.	Dynamic Programming	Fundamentals of Dynamic programming-based solution approach; 0/1 Knapsack; Shortest path using Floyd Warshall; Coinage problem; Matrix Chain Multiplication; Longest common subsequence; Longest increasing sequence, String editing, etc.	7

6.	String Algorithms	Naïve String Matching, Finite Automata Matcher, Rabin Karp matching algorithm, Knuth Morris Pratt, Solving string problems using string data structures like Tries, Suffix Tree, and Suffix Array	6
7.	Problem Spaces and Problem solving by search	Problem Spaces: States, goals and operators, Factored representation (factoring state into variables) Uninformed search (BFS, DFS, DFS with iterative deepening), Heuristics and informed search (hill-climbing, generic best-first, A*)	5
8.	Tractable and Non-Tractable Problems	Efficiency and Tractability, P, NP, NP-Complete, NP-Hard problems	2
		Total number of Lectures	**42**

Evaluation Criteria

T1	20 Marks
T2	20 Marks
End Semester Examination	35 Marks
TA	25 Marks(Attendance/Mini-project/Coding Contest/Hackathon)

Project based learning: Each student in a group of 3-4 will have to develop a mini project based on data structures algorithms. The students can opt any real-world application where these algorithms can be applied. The students have to implement the mini project using C/C++/Java language. Project development and its presentation will enhance coding skills, knowledge and employability of the students in IT sector.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. **(Reference Books,** Journals, Reports, Websites etc. in the IEEE format)	
1.	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, Introduction to Algorithms, MIT Press, 3rd Edition, 2009
2.	Steven Skiena,The Algorithm Design Manual, Springer; 2nd edition, 2008
3.	Knuth, The art of Computer Programming Volume 1, Fundamental Algorithms, Addison-Wesley Professional; 3rd edition,1997
4.	Horowitz and Sahni, Fundamentals of Computer Algorithms, Computer Science Press, 2008
5.	Sedgewick, Algorithms in C, 3rd edition. Addison Wesley, 2002
6.	Alfred V. Aho, J.E. Hopcroft, Jeffrey D. Ullman, Data Structures and Algorithms, Addison-Wesley Series in Computer Science and Information Processing, 1983
7.	ACM Transactions on Algorithms (TALG)
8.	Algorithmica Journal, Springer
9.	Graphs and Combinatorics, Journal, Springer
10.	The ACM Journal of Experimental Algorithmics
11.	https://online.stanford.edu/courses/soe-ycsalgorithms1-algorithms-design-and-analysis-part-1 https://online.stanford.edu/courses/soe-ycs0001-algorithms-design-and-analysis-part-2 https://in.coursera.org/specializations/algorithms
Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. **(Text books**)	
1.	Tim Roughgarden, Algorithms Illuminated: Part 1: The Basics, Soundlikeyourself Publishing, September 27, 2017
2.	Tim Roughgarden, Algorithms Illuminated:Part 2: Graph Algorithms and DataStructures,Soundlike yourself Publishing, First Edition, 2018.
3.	Tim Roughgarden, Algorithms Illuminated:Part3:Greedy Algorithms and Dynamic Programming,Soundlikeyourself Publishing, First Edition, 2019.
4.	Weiss, Data Structures and Algorithm Analysis in C++, 4th Edition**,** Pearson, 2014

Probability and Random Processes (15B11MA301)

Conditional probability, Bayes theorem, random variables, probability and cumulative density functions, MGF and CF, joint, marginal and conditional distributions, probability distributions, Bernoulli, Binomial, Poisson, Negative binomial, Geometric distributions. Uniform, Exponential, Normal, Gamma, Earlang, Weibull distributions, reliability, MTTF, system reliability, random processes, averages, stationary processes, random walk, Wiener process, semi-random telegraph signal process, ergodic processes, PSDF, Poisson processes, Markov chains.

Course Description

Course Code	15B11MA301	**Semester** Even	**Semester** IV **Session** 2023-2024 **Month from** Jan 2024- May 2024
Course Name	Probability and Random Processes		
Credits	4	**Contact Hours**	3-1-0
Faculty (Names)	**Coordinator(s)**	Dr. Manish Kumar Bansal, Dr. Kamlesh Shukla	
	Teacher(s) (Alphabetically)	Dr. Bhagwati Prasad Chamola, Dr. Nisha Shukla, Dr. Aradhana Narang, Dr. Lakhveer Kaur, Dr. Kamlesh Shukla, Dr. Manish Kumar Bansal, Dr. Gaurav Agarwal, Dr. Shikha Pandey, Dr. Shashank Goel, Dr. Amita Bhagat, Dr. Sarfraz, Dr. Neha Ahlawat	

COURSE OUTCOMES:		**COGNITIVE LEVELS**
After pursuing the above mentioned course, the students will be able to:		
C201.1	recall the concepts of probability theory and probability distributions.	Remembering Level (C1)
C201.2	explain random variables, probability distributions and reliability models.	Understanding Level (C2)
C201.3	solve the problems concerning random variables, their distributions, reliability models and random processes.	Applying Level (C3)
C201.4	examine random process models and solve the related problems.	Analyzing Level (C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Probability	Three basic approaches to probability, conditional probability, total probability theorem, Bayes' theorem.	5
2.	Random Variables	One dimensional random variables (discrete and continuous), distribution of a random variable (density function and cdf). MGF and characteristic function of a random variable and its utility. Bivariate random variable, joint, marginal and conditional distributions, covariance and correlation.	8
3.	Probability Distributions	Bernoulli, binomial, Poisson, negative binomial, geometric distributions. Uniform, exponential, normal, gamma, Earlang and Weibull distributions.	8

4.	Reliability	Concept of reliability, reliability function, hazard rate function, mean time to failure (MTTF). Reliability of series, parallel, series-parallel, parallel-series systems.	6
5.	Random Processes I	Introduction, Statistical description of random processes, Markov processes, processes with independent increments. Average values of random processes. Strict sense and wide sense stationary processes, their averages. Random walk, Wiener process. Semi-random telegraph signal and random telegraph signal process. Properties of autocorrelation function.	7
6.	Random Processes II	Ergodic processes. Power spectral density function and its properties. Poisson processes. Markov chains and their transition probability matrix (TPM).	8
Total number of Lectures			**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz, Assignments, Tutorials)
Total	**100**

Project based learning: Each student in a group of 4-6 will apply the concept of probability distributions of random variables and reliability models arising in different real-life situations.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	**Veerarajan, T.,** Probability, Statistics and Random Processes, 3rd Ed. Tata McGraw-Hill, 2008.
2.	**Papoulis, A. & Pillai, S.U.,** Probability, Random Variables and Stochastic Processes, Tata McGraw-Hill, 2002.
3.	**Ross, S. M.,** Introduction to Probability and Statistics for Engineers and Scientists, 4th Ed., Elsevier, 2004.
4.	**Palaniammal, S.,** Probability and Random Processes, PHI Learning Private Limited, 2012.
5.	**Prabha, B. and Sujata, R.,** Statistics, Random Processes and Queuing Theory, 3rd Ed., Scitech, 2009.

CO-PO-PSO mapping

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
C201.1	1	2	1	1								2		
C201.2	2	2	2	1								2		
C201.3	3	2	3	2					1			2		
C201.4	3	3	3	2								2		
Avg	**2.30**	**2.30**	**2.30**	**1.50**					**1.00**			**2.00**		

Detailed Syllabus
Lab Session-wise Breakup

Subject Code	15B17CI471	**Semester Even** **(specify ~~Odd~~/Even)**	**Semester** IV **Session** 2023-2024 **Month from:** Jan **to** June 2024
Subject Name	Algorithms and Problem Solving Lab		
Credits	**1**	**Contact Hours**	**2**

Faculty (Names)	**Coordinator(s)**	Dr. Sherry Garg (62), Dr. Neeraj Jain (128)
	Teacher(s) (Alphabetically)	**J62:** Anita Sahu, Deepika Varshney, Jyoti Chouhan, Manish K Thakur, Prantik Biswas, Sherry Garg, Shikha Jain, Taj Alam, Tribhuwan K Tewari, Vivek K Singh **J128:** Aditi Sharma, Arti Jain, Devpriya Soni, Himani Bansal, Janardan kumar Verma, Krishna Asawa, Neeraj Jain, Prakhar Mishra, Pulkit Mehndiratta, Rajiv kumar Mishra, Rashmi Kushwaha

COURSE OUTCOMES		**COGNITIVE LEVELS**
C274.1	Understand and define appropriate data structure to a given problem	Understand Level (Level 2)
C274.2	Understand complexity using asymptotic and experimental analysis for various algorithmic design techniques.	Understand Level (Level 2)
C274.3	Apply and build various algorithms and design techniques to solve the given problem.	Apply Level (Level 3)
C274.4	Formulate, elaborate and design an efficient solution to a given problem using appropriate data structure and algorithm design technique	Evaluation Level (Level 6)

Module No.	**Title of the Module**	**List of Experiments**	**No. of Lectures for the module**
1.	Analysis of algorithms, Searching and sorting based problems	Introduction to problem solving approach; Asymptotic Analysis; Solving Recurrences; Empirical analysis of sorting and searching algorithms – Merge sort, Quick sort, Heap sort, Radix sort, Count sort, Binary search, and Median search	01
2.	Design Technique: Divide and Conquer	Problems based on Divide and Conquer (D&C) approach such as Binary search, Quick sort, and Merge sort; and Closest pair, etc.	01
3.	Design Technique: Backtracking Algorithms	Review of backtracking based solution approach using N queen, and Rat in a maze; M-coloring problem; Hamiltonian Cycle detection; Travelling salesman problem; Network flow	02
4.	Design Technique: Greedy Algorithms	Introduction to greedy based solution approach; Minimum Spanning Trees (Prim's and Kruskal algorithms); Shortest Path using Dijkstra's algorithm;	03

		Fractional and 0/1 Knapsack; Coinage problem; Bin packing; Job scheduling – Shortest job first, Shortest remaining job first, etc.; Graph coloring; and Text compression using Hamming coding and Shannon-Fano coding, etc.	
5.	Dynamic Programming	Fundamentals of Dynamicprogramming based solution approach; 0/1 Knapsack; Shortest path using Floyd Warshall; Coinage problem; Matrix Chain Multiplication; Longest common subsequence; Longest increasing sequence, String editing	02
6.	String Algorithms	Naïve String Matching, Finite Automata Matcher, Rabin Karp matching algorithm, Knuth Morris Pratt, Tries; Suffix Tree; and Suffix Array	02
7.	Problem Spaces and Problem solving by search	Problem Spaces: States, goals and operators, Factored representation (factoring state into variables) Uninformed search (BFS, DFS, DFS with iterative deepening), Heuristics and informed search (hill-climbing, generic best-first, A*)	02
8.	Case-study / Assignment / Mini-Project	Designing an efficient solution to a given problem using appropriate data structure and algorithm design technique	01
		Total number of Labs	**14**

Evaluation Criteria

Components	**Maximum Marks**
V1	**20**
V2	**20**
Eval1/Eval2	**20**
Day-to-Day	**10**
TA	**30** Attendance (15), Assignement/Quiz/Mini-Project (15)
Total	**100**

Project based learning: Students in a group of 4-5 will be designing an efficient solution to a given problem / case-studies using appropriate data structure and algorithm design technique studies in the course. The students have to implement the mini project using C/C++/Java language. Project development and its presentation will enhance coding skills, knowledge and employability of the students in IT sector.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text Books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

Text Book(s):

1.	Tim Rough garden, Algorithms Illuminated: Part 1: The Basics, Sound like yourself Publishing, September 27, 2017
2.	Tim Rough garden, Algorithms Illuminated: Part 2: Graph Algorithms and Data Structures, Sound like yourself Publishing, First Edition, 2018.
3.	Tim Rough garden, Algorithms Illuminated: Part3:Greedy Algorithms and Dynamic Programming, Sound like yourself Publishing, First Edition, 2019.
4.	Weiss, Data Structures and Algorithm Analysis in C++, 4th Edition**,** Pearson, 2014

Reference Book(s):

5.	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, Introduction to Algorithms, MIT Press, 3rd Edition, 2009
6.	Steven Skiena ,The Algorithm Design Manual, Springer; 2nd edition , 2008

7.	Knuth, The art of Computer Programming Volume 1, Fundamental Algorithms, Addison-Wesley Professional; 3 edition,1997
8.	Horowitz and Sahni, Fundamentals of Computer Algorithms, Computer Science Press, 2008
9.	Sedgewick, Algorithms in C, 3rd edition. Addison Wesley, 2002
10.	Alfred V. Aho, J.E. Hopcroft, Jeffrey D. Ullman, Data Structures and Algorithms, Addison-Wesley Series in Computer Science and Information Processing, 1983

Detailed Syllabus
Lecture-wise Breakup

Course Code	**15B1NHS431**	**Semester:EVEN**	**Semester IV** Session**2023-24** **Month: January 2024 to June 2024**
Course Name	**Introduction to Literature**		
Credits	**3**	**Contact Hours**	**3 (2-1-0)**

Faculty (Names)	**Coordinator(s)**	Dr. Monali Bhattacharya (Sector 62) & Dr. Ekta Srivastava (Sector 128)
	Teacher(s) (Alphabetically)	Dr. Ekta Srivastava, Dr. Monali Bhattacharya

COURSE OUTCOMES		**COGNITIVE LEVELS**
C206-5.1	Understand figurative language to demonstrate communication skills individually and in a group.	CL-2 Understanding
C206-5.2	Develop a critical appreciation of life and society through a close reading of select texts.	CL-3 Applying
C206-5.3	Analyse a literary text thematically and stylistically and examine it as representing different spectrum of life, human behavior and moral consciousness of society.	CL-4 Analysing
C206-5.4	To interpret Literature as reflection of cultural and moral values of life and society.	CL-5 Evaluating

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction to Literature & Genres	Introduction Literary Genres Literary Devices Learning Communication Skills through Literature	5
2.	Poems	On His Blindness: John Milton My Last Duchess: Robert Browning “Hope” is the thing with feathers: Emily Dickinson A Prayer before Birth: Louis MacNeice Goodbye Party for Miss Pushpa T.S.: Nissim Ezekiel	6
3.	Prose & Short Stories	The Spectator Club: Richard Steele Evidence: Isaac Asimov Toba Tek Singh: Saadat Hasan Manto	6
4.	Plays & Drama	Andher Nagari Chaupat Raja: Bhartendu Harishchandra The Characters of Macbeth & Lady Macbeth as Universal Characters. Arms & The Man: G B Shaw	7
5.	Novel	To Sir with Love: E.R. Braithwaite	4

Total number of Lectures	28

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Project, Quiz and class participation)
Total	**100**

Project Based Learning:

The students will create a story out of a song in groups and analyse their own creativity applying Freitag's narrative technique, identify literary devices and interpret their work thematically highlighting language, cultural and moral learnings, one would get on reading their story. The created works will be exchanged and peer review will be undertaken and reports will be submitted as Part B of the project.

Recommended Reading material:

1	John E. Eck, '*Writing with Sweet Clarity'* 1st Edition. Routledge. 2022https://doi.org/10.4324/9781003167532
2	M.H. Abrams, Geoffrey Harpham *'A Glossary of Literary Terms'*, 11th Edition, Cengage Learning, 2014,
3	Mark William Roche, *'Why Literature matters in the 21st Century'*, 1st Edition, Yale University Press, 2004.
4	E.R. Braithwaite, *'To Sir With Live'*, First Edition, Bodley Head, UK, 1959. Susie Thomas(Ed), "E. R. Braithwaite: 'To Sir, with Love' – 1959", Available at http://www.londonfictions.com
5	Khalid Hasan (Translator), *'Saadat Hasan Maanto : Toba Tek Singh'* Reprint, Penguin Books, India, 2008.
6	G.B Shaw, '*Arms & The Man'*, Paperback, 2013 https://onemorelibrary.com/index.php/en/?option=com_djclassifieds&format=raw&view=download&task=download&fid=10428
7	Anon, (a.n.d.). *The Spectator Club. Sir Richard Steele*. 1909-14. Available at: https://www.bartleby.com/27/7.html
8	*All poems online: http://www.poetryfoundation .org*
9	WolfgangClemen, '*Shakespeare's Soliloquies'*, First Edition, Routledge, London, 1987.

Detailed Syllabus
Lecture-wise Breakup

Course Code	**15B1NHS433**	**Semester** EVEN **(specify Odd/Even)**	**Semester** IV **Session** 2022 -2023 MonthJan2021- June2021
Course Name	**INTRODUCTION TO SOCIOLOGY**		
Credits	**3(2-1-0)**	**Contact Hours**	3

Faculty (Names)	**Coordinator(s)**	Prof Alka Sharma
	Teacher(s) (Alphabetically)	Ms.Shikha Kumari

COURSE OUTCOMES		**COGNITIVE LEVELS**
C206-7.1	Demonstrate an understanding of sociological perspectives and concepts.	Remembering (C1)
C206-7.2	Explain the concept of social stratification and types of stratification as class, caste and gender.	Understanding (C2)
C206-7.3	Apply the major sociological perspectives, social concepts and methods in the systematic study of society	Applying(C3)
C206-7.4	Analyze the relevance of various social Institutions in societies and how it shapes and influences social interactions.	Analyzing (C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction	Introduction to sociology as a discipline of social science, difference between common sense and sociology, Major sociological perspective and methods, the sociological imagination	5
2.	Basic Concepts of Sociology	Groups, sub-groups, society, characteristics of society, culture, institutions, Institutionalization, Conformity, Social Change	6
3.	Social stratification	Stratification-concept, theories and type. Basis of stratification caste, class, gender and race, status and Roles	5
4.	Sociology of Institutions	Kinship, Family ,Religion, Education &Economy in Society	6
5.	Process of Change and Mobility	Process of Social Change in Indian Society: Sanskritization, Westernization, Modernization, Urbanization	4
6.	Sociology of Collectivity	Collective Action and Social Movements	2
		Total number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Project basedpresentation, assignment and quiz)
Total	**100**

The students will find out which aspect of Organizational culture influences the employee' performance and formulate recommendations regarding organizational culture, which will help the organization to be

more inclusive of different cultural practices of the employees (tackle issues such as gender equity, respect for other languages, reduce racial identity crisis, reduce class and caste discrimination, promote respect for all religions etc) to increase their belongingness towards the organization.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1	Johnson, Harry M. *Sociology: a systematic introduction*. Routledge, 2013.
2	Rawat, H. K. *Sociology: basic concepts*. Rawat Publications, 2007.
3	Macionis, John J. *Society: the basics*. Pearson/Prentice Hall, 2009.
4	C. Wright. And Mills, *The Sociological Imagination*, Oxford: Oxford University Press, 1959.
5	Peter L Berger, *The Social Construction of Reality: a Treatise in the Sociology of Knowledge. Garden City,* New York: Anchor, 1966.
6	Conley and Dalton, *You May Ask Yourself: An Introduction to Thinking Like a Sociologist*, 2nd Ed, W. W. Norton & Company New York, 2011. ISBN: 0393935175 or 978-0393935172
7	Ballentine and Roberts, *Our Social World: Introduction to Sociology*, 4th Edition, Sage. 2013.
8	Robert Parkinand Linda Stone, (ed.). *Kinship and Family: An Anthropological Reader*, U.S.A.: Blackwell, 2000, selected chapters

Detailed Syllabus
Lecture-wise Breakup

Course Code	15B1NHS434	**Semester:** Even	**Semester** IV **Session** 2023 -2024 **Month from** Jan 2024 to June 2024
Course Name	Principles of Management		
Credits	**3**	**Contact Hours**	2-1-0

Faculty (Names)	**Coordinator(s)**	Dr. Aviral Mishra
	Teacher(s) (Alphabetically)	Dr. Aviral Mishra

COURSE OUTCOMES		**COGNITIVE LEVELS**
C303-1.1	Describe the functions, roles and skills of managers and illustrate how the manager's job is evolving.	Understanding Level (C2)
C303-1.2	Examine the relevance of the political, legal, ethical, economic and cultural environments in global business.	Analyzing Level (C4)
C303-1.3	Evaluate approaches to goal setting, planning and organizing in a variety of circumstances.	Evaluating Level (C5)
C303-1.4	Evaluate contemporary approaches for staffing and leading in an organization.	Evaluating Level (C5)
C303-1.5	Analyze contemporary issues in controlling for measuring organizational performance.	Analyzing Level (C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction to Managers and Management	Management an Overview: Introduction, Definition of Management, Role of Management, Functions of Managers, Levels of Management, Management Skills and Organizational Hierarchy, Social and Ethical Responsibilities of Management: Arguments for and against Social Responsibilities of Business, Social Stakeholders, Measuring Social Responsiveness and Managerial Ethics, Omnipotent and Symbolic View, Characteristics and importance of organizational culture, Relevance of political,legal,economic and Cultural environments to global business, Structures and techniques organizations use as they go international .	7
2.	Planning	Nature & Purpose, Steps involved in Planning, Objectives, Setting Objectives, Process of Managing by Objectives, Strategies, Policies & Planning Premises, Competitor Intelligence, Benchmarking, Forecasting, Decision-Making.	5
3.	Organizing	Organizing ,Benefits and Limitations-De-Centralization and Delegation of Authority, Authority versus Power ,Mechanistic Versus Organic Organization ,Common Organizational Designs, Contemporary Organizational Designs and Contingency Factors, The Learning Organization Nature and Purpose, Formal and Informal Organization, Organization Chart, Structure and Process, Departmentalization by difference strategies, Line and Staff authority- Benefits and Limitations-De-Centralization and Delegation of Authority Versus, Staffing ,Human Resource	7

		Inventory, Job Analysis , Job Description, Recruitment and Selection, Selection Tools Staffing, Managerial Effectiveness,Staffing, Training, Employee Performance Management, Compensation and Benefits, Contemporary Issues in Managing Human Resources .	
4.	Directing	Scope, Human Factors, Creativity and Innovation, Harmonizing Objectives, Leadership, Types of Leadership,Directing, Managers as leaders, Early Leadership Theories…Trait Theories, Behavioral Theories, Managerial Grid, Contingency Theories of Leadership,Directing ...Path Goal Theory, contemporary views of Leadership, Cross Cultural Leadership, Leadership Training, Substitutes of Leadership	4
5.	Controlling	Controlling, Introduction to Controlling System and process of Controlling, Requirements for effective control, The planning Contol link, The process of control, types of control The Budget as Control Technique, Information Technology in Controlling, Productivity, Problems and Management, Control of Overall Performance, Direct and Preventive Control, Financial Controls , Tools for measuring organizational Performance ,Contemporary issues in control Workplace concerns, employee theft, employee violence	5
		Total number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Project, Attendance)
Total	**100**

Project Based Learning: The project is to be done in group size of 4-5 members each. Student groups can choose an organizationfrom one of the following themes-Staffing and Controlling in a virtual world, Staffing and controlling in the Banking Sector, Staffing and Controlling and the IT industry, Staffing and Controlling in Hospitality/Telecom/Airlines, Staffing and Controlling in Logistics, Staffing and Controlling in International Business and Staffing and Controlling in Consulting. Study the staffing and controlling processes of the chosen organization. Students were asked to submit their research analysis in the form of a project report. This adds to the management related employability skills in an organization as staffing and controlling are important aspects of overall management function.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Koontz H, Weihrich H. Essentials of management: an international, innovation, and leadership perspective. McGraw-Hill Education; 10th Edition 2018.
2.	Tripathi PC. Principles of management. Tata McGraw-Hill Education; 6th Edition 2017.
3.	Principles of Management Text and Cases, Pravin Durai , Pearson ,2015
4.	Robbins, S.P. & Decenzo, David A. Fundamentals of Management,7th ed., Pearson, 2010
5.	Robbins, S.P. & Coulter, Mary Management; 14 ed.,Pearson , 2009

Detailed Syllabus
Lecture-wise Breakup

Course Code	15B1NHS435	**Semester**: Even	**Semester Session**:2023-24 **Month from**: Jan-June 2023
Course Name	Financial Accounting		
Credits	3	Contact Hours	3 (2-1-0)

Faculty (Names)	**Coordinator(s)**	Dr. Sakshi Varshney (Sec-128) &Dr. Purwa Srivastava (Sec 62)
	Teacher(s) (Alphabetically)	Dr. Purwa Srivastava & Dr. Sakshi Varshney

COURSE OUTCOMES		**COGNITIVE LEVELS**
C206-8.1	Understand the basic concepts of Accounting.	Understanding level (C2)
C206-8.2	Apply accounting concepts for recording of business transactions.	Applying level (C3)
C206-8.3	Compare and reconcile the accounting records with other sources of information.	Analyzing level (C4)
C206-8.4	Evaluate the accounting records to identify and rectify the errors made during accounting process.	Evaluating level (C5)
C206-8.5	Construct the final accounts and cash flow statement of a business.	Creating (C6)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction to Accounting	Meaning of Accounting, Objectives of Accounting, Understanding Company Management, Stakeholders versus Shareholders, Financial Reporting Standards, Financial Reporting	2
2.	Understanding Accounting Elements	Elements of Financial Statements- Assets, Current assets, Liabilities, Current liabilities, Equity, Income, Expenses, Accounting Equation	2
3.	Accounting Concepts	Business entity concept, Money measurement concept, Going concern, Consistency, Matching concept, Cost concept, Dual aspect concept, Materiality, Full disclosure, Generally Accepted Accounting Principles (GAAP)	2
4.	Journal Transactions	Journal, Rules of Debit and Credit, Compound Journal entry, Opening entry	2
5.	Ledger Posting and Trial Balance	Ledger, Posting, relationship between Journal and Ledger, Rules regarding Posting, Trial balance	3

6.	Rectification of Errors	Different types of errors, their effect on trial balance, rectification and preparation of suspense account	5
7.	Bank Reconciliation Statement	Meaning of Bank Reconciliation Statement, technique of preparing BRS, Causes of difference	2
8.	Final Accounts	Trading account, Profit and Loss account, Balance sheet, Adjustment entries	6
9.	Cash Flow Statement	Introduction of Cash Flow Statement, Classification of Cash inflows and Cash Outflows Activities, Elements of the Cash Flow Statement, Methods of Cash Flow Statement, Limitations Of Cash Flow Statement	4
		Total number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Project+ Class test/Quiz+ Class Participation)
Total	**100**

Project Based learning: Students form a group of 4-5 students. Each group is required to choose a company listed in Indian stock exchange and download its latest annual report. Students are required to describe the company, composition of board of directors, number of company's executives, independent directors, and background of independent directors. They are required to find out financing, investing and operating activities and examine the change in total assets, sales and net profit of the company. As per auditor's report, company's position and future plans for growth of the company is also analyzed.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Maheshwari, S. N., Maheshwari, S.K. Maheshwari, S.K., Financial Accounting, 6th Ed., S. Chand & Sons Publication, 2018.
2.	Narayanswamy, R., Financial Accounting: A Managerial Perspective, 7th Ed., Taxmann Publications, 2017
3.	Tulsian,P., Financial Accounting,2nd Ed., Pearson Education India,2017
4.	Bhattacharya, A., Financial Accounting for Business Managers, 5th Ed., Prentice Hall of India,2016
5.	Weygandt.J., Kimmel, P., Kieso,D., Accounting Principles, 12th Edition, John Wiley & Sons,2015
6.	Barton,M., Bhutta, P.,S. O'Rourke,J.,Satyam Computer Services Ltd: Accounting fraud in India,London,SAGE Publications Ltd, 2017
7.	Lal,J.,Srivastava,S., Financial Accounting : Principles and Practices, 1st Edition., S. Chand & Sons Publication, 2006.

Detailed Syllabus
Lecture-wise Breakup

Course Code	18B11EC213	**Semester** Even	**Semester** IV **Session** 2023-24 **Month from** Jan-June
Course Name	DIGITAL SYSTEMS		
Credits	4	**Contact Hours**	3+1

Faculty (Names)	**Coordinator(s)**	Dr. Priyanka Kwatra, Dr. Vishal Narain Saxena
	Teacher(s) (Alphabetically)	Dr. Mandeep Narula, Dr. Megha Agarwal, Mr. Prabhanshu Yadav, Dr. Priyanka Kwatra, Dr. Shradha Saxena, Dr. Vimal Kumar Mishra, Dr. Vishal Narain Saxena

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Understand the fundamentals of number system, Boolean algebra and Boolean function minimization techniques.	Understanding Level (C2)
CO2	Applying the concepts of Boolean algebra to implement combinational circuits and flip flops using logic gates.	Applying Level (C3)
CO3	Analyze state diagram and construct sequential logic circuits using flip flops. Also, classify the signals & systems and analyse the signals using Fourier transform.	Analyzing Level (C4)
CO4	Determine the various steps involved in the digitization and transmission of signals and evaluate their performance parameters.	Evaluating Level (C5)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Number systems and Combinational Circuits	Number systems (Binary, Octal, Hexadecimal) conversion, BCD numbers, gray code, excess–3 code. Binary addition and subtraction, signed and unsigned binary numbers, 1's and 2's complement representation. Boolean Theorem, Canonical Forms: SOP & POS Karnaugh Map, Quine-McCluskey method, Prime Implicants, Essential Prime implicants Introductions to Logic gates, Adder, Subtractor, Multiplexer, Demultiplexer, Encoder, Decimal to BCD Encoder, Decoder, Comparator	12
2.	Flip Flops	SR, JK, Master Slave JK, T And D; Excitation Tables,Conversion of Flip-Flops	3
3.	Counters	Synchronous and Asynchronous Counters, Design ofCounters Using Flip- Flops, Registers, Shift Registers,Counters Using Shift Registers; State Diagram Design,Analysis of Sequential Circuits Using Flip-Flops	9
4.	Signals and systems	Signals and classification of signals: Continuous time anddiscrete time, Even and odd, periodic and non-periodic,Energy and Power signals, Basic signals: unit impulse, unitstep and unit ramp. Basic operations of signals: timescaling,time- shifting, etc. Systems and classification ofsystems: continuous and discrete, Linear and non-linear,causal and non-causal.	5
5.	Fourier Analysis	Fourier Series, Fourier Transform Fourier Transform pair of standard signals and properties of Fourier transform.	3
6.	Sampling and Pulse code modulation	Introduction to Modulation, Need of Modulation, Analogue Modulation techniques, Sampling theorem, Nyquist rate and Nyquist interval. Quantization (Mid-rise and Mid- tread)	7

7.	Digital modulation techniques and Line coding	PCM (modulator and demodulator), Transmission bandwidth in PCM, Signal to quantization noise ratio of PCM. ASK, FSK and PSK modulation techniques.	3
		Total number of Lectures	**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Assignment = 10, Quiz = 5, Attendance = 10)
Total	**100**

Program Based Learning: Students will be able to design and implement the projects using decoders, comparators and multiplexers. Desiging of new flip flops, counters and shift resistors enhance the application ability in students. Analog to digital signal transimission techniques and several digital communication techniques develop latest knowledge for wireless communication based Industries.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	S. Salivahanan, and S. Arivazhagan,"Digital circuits and design", Vikas publishing house PVT Limited.Fifth edition (March 2018)
2.	Oppenheim, Alan V., Alan S. Willsky, and Syed Hamid Nawab. "Signals and Systems," Prentice-HallEnglewood Cliffs 2 edition (2015)
3.	S. Haykin,"Digital Communications Systems", John Wiley & Sons, 1 edition,2013
4.	H. Taub & D. L. Schilling, "Principles of Communication Systems", 2nd edition, McGraw-Hill HigherEducation. 3 edition (September 2007)

Detailed Syllabus
Lecture-wise Breakup

Course Code	**23B12HS211**	**Semester: Even**	**Semester IV Session 2023-2024** **Months: from Jan. to June 2024**
Course Name	**Introduction to Political Science**		
Credits	3 (2-1-0)	Contact Hours	3

Faculty (Names)	**Coordinator(s)**	**Dr. Namreeta Kumari**
	Teacher(s) (Alphabetically)	**Dr. Namreeta Kumari**

COURSE OUTCOMES		**COGNITIVE LEVELS**
C206-9.1	Demonstrate an understanding concept of Political Science.	Understand (Level 2)
C206-9.2	Assess the different political ideologies.	Evaluate (Level 5)
C206-9.3	Assess the concept of state and different theories of state.	Evaluate (Level 5)
C206-9.4	Demonstrate an understanding of democracy and models of democracy.	Understand (Level 2)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Understanding Political Science	● Evolution ● Nature and Scope ● Is Political Science a Science?- Political Science as an art, Political Science as a Science ● Importance of Studying Political Science	6
2.	Analyzing the Ideological Discourse	● Liberalism: Individualism, Justice, Equality, & Reason ● Conservativism: Authoritarian Conservatism, Paternalistic Conservatism, Libertarian Conservatism	8

		• Socialism: Classical Marxism, Orthodox Communism, Ethical Socialism, Revisionist Socialism, Neo revisionism & the third way • Anarchism: Collectivist Anarchism, Induvial Anarchism, Anarcho-Capitalism. • Nationalism: Liberal nationalism, Conservative Nationalism Expansionist Nationalism, Anti Colonial post-colonial nationalism. • Feminism: Redefining Political, Waves of Feminism, Strands of Feminism • Multiculturalism: Politics of Recognition, Liberal multiculturalism, Pluralist Multiculturalism, Cosmopolitan Multiculturalism, Critiques of Multiculturalism	
3.	State	• What is State: Idea of state • Theories of State: Evolutionary theory of state, Marxist theory of state, Liberal Theory of State • Role of State	8
4.	Democracy	• Defining Democracy • Models of Democracy- David Held's Model • Rival Theories of Democracy	6
Total number of Lectures			**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
T3	35
TA	25 (Attendance, Quiz, Project)
Total	**100**

Project Based learning: Each student would form a group of 3-4 students and to make projects on issues related with Indian Political System. The project will facilitate students to comprehend the everyday politics of the country.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	A. Heywood, Political Ideologies: An Introduction, New York: Palgrave Macmillan, 2017.
2.	D. Held, Models of Democracy, Stanford: Standford University Press, 2006

3.	B. O'Leary and P. Dunleavy, Theories of the State: The Politics of Liberal Democracy, London: Macmillan Education Ltd., 1987.
4.	S. De. Beauviour, Second Sex, NewYork: Vintage Books, 1949
5.	A Y. Davis, Abolition Democracy: Beyond Empire, Prisons, and Torture, New York : Seven Stories Press. 2005

Detailed Syllabus
Lecture-wise Breakup

Subject Code	**24B12HS211**	**Semester: Even**	**Semester: IV Session: 2023-24** **Month: Jan 2024 to June 2024**
Subject Name	**Media, Culture and Society**		
Credits	**3**	**Contact Hours**	**(2-1-0)**

Faculty (Names)	**Coordinator(s)**	**Dr Nibha Sinha**
	Teacher(s) (Alphabetically)	**Dr Nibha Sinha**

CO Code	**COURSE OUTCOMES**	**COGNITIVE LEVELS**
C206-10.1	Understanding of basic concepts, theories and methods to critically evaluate and adjudge the role of media and social media to shape contemporary culture and society	Understanding Level-(C2)
C206-10.2	Analyzing the importance of media strategy and media literacy in social transformation	Analyzing Level-(C4)
C206-10.3	Analysis of New Media emergence, production, convergence and its challenges	Analyzing Level-(C4)
C206-10.4	Critical evaluation of media content, and the ways in which media is used by state and non- state actors in social life, cultural production, politics, and governance.	Evaluating Level-(C5)
C206-10.5	Creating constructive and analytical approach towards Social, cultural and political prospects of media	Creating Level- (C6)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	**Introduction**	Orientation of the Course	1
2.	**Introduction to Media Studies: Basic Theories and Concepts**	Theorizing Media, Culture and Society; Identity and Culture, Media and the changing of Social Character, representation and emergence of consumerism and media cultures.	6
3	**Mass Media and Development Communication**	Gender, Race and Ethnicity, Media Literacy and Development, Media and Social Change, Communication Strategies for Development, influence of media on attitudes and behaviors, media impact on social transformations.	6
4.	**Media in/as social worlds: Challenges**	Emergence of New media, and its production: (ownership patterns and control, advertising), Convergence, social media: social significance and challenges	5
5	**Visual Media: Images and Implications**	Semiotics and Visual Analysis, Advertising and Visual Persuasion, Visual Storytelling in Film and Television and its impact, Myths and stereotypes in Media Representation, Power of Images in Shaping Public Opinion	6
6	**Media and State, democracy and the publics**	Mediated Politics: Opinion political campaigns and polls, Media as public sphere: virtual citizenship, Deconstructing Orientalism in Media.	4

Total number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Project, Presentation and Attendance)
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Paul Dodkinson, Media, Culture and Society: An Introduction, Sage, 2016.
2.	Douglas Kellner, Media Culture: Cultural Studies, Identity and Politics between the modern and the Post Modern, 2016
3.	Stig Hjarvard, The Mediatization of Culture and Society, Routledge, 2013
4.	Tonny Bennett, James Curran, Michael Gurevitch, Janet Wollacott, Culture, Society and The Media, Routledge, 1982

COs (NBA Code)	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C206-10.1						3			1			3		
C206-10.2						3			2			3		
C206-10.3						3		1	2	2		3		
C206-10.4						3		2	1	2		3		
C206-10.5						3		3	2	2		3		
Avg.						3.00		2.00	1.60	2.00		3.00		