Detailed Syllabus
Lecture-wise Breakup

Subject Code	15B11CI411	**Semester: Even** **(Specify Odd/Even)**	**Semester** IV **Session** 2022 -2023 **Month from:** Jan 2023 to June 2023
Subject Name	Algorithms and Problem Solving		
Credits	**3**	**Contact Hours**	**3**

Faculty (Names)	**Coordinator(s)**	Manish Kumar Thakur (J62), Krishna Asawa (J128)
	Teacher(s) (Alphabetically)	J62 – Anita Sahoo, Dhanalekshmi G., Himansu Pattanayak, Manish Kumar Thakur, Tribhuwan Kumar Tewari J128 – Krishna Asawa, Neeraj Jain, Nitin Shukla, Varsha Garg

COURSE OUTCOMES		**COGNITIVE LEVELS**
C214.1	Analyse the complexity of different algorithms using asymptotic analysis	Analyze Level (Level 4)
C214.2	Select an appropriate data structure and apply related operations for a given problem	Apply Level (Level 3)
C214.3	Apply algorithmic principles for solving a given problem	Apply Level (Level 3)
C214.4	Identify, formulate and design an efficient solution to a given problem using appropriate data structure and algorithm design technique	Create Level (Level 6)

Module No.	**Subtitle of the Module**	**Topics in the Module**	**No. of Lectures for the module**
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**/Hackathon/Quiz)

Project based learning: Each student in a group of 3-4 will have to develop a mini project based on data structures and 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, 4th Edition, 2022
2.	Steven Skiena, The Algorithm Design Manual, Springer; 3rd Edition, 2020
3.	Ellis Horowitz, Sartaj Sahni, and Sanguthevar Rajasekaran, Computer Algorithms, Second Edition, Silicon Press, 2008
4.	Robert Sedgewick, Algorithms in C, 3rd Edition. Addison Wesley, 2002
5.	ACM Transactions on Algorithms (TALG)
6.	Algorithmica Journal, Springer
7.	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, Sound like yourself Publishing, September 27, 2017
2.	Tim Roughgarden, Algorithms Illuminated: Part 2: Graph Algorithms and Data Structures, Sound like yourself Publishing, First Edition, 2018.
3.	Tim Roughgarden, 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

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** III **Session** 2022-2023 **Month from** Jan 2023- Jun 2023	
Course Name	Probability and Random Processes			
Credits	4	**Contact Hours**	3-1-0	
Faculty (Names)	**Coordinator(s)**	Prof. B. P. Chamola, Dr. Aradhana Narang, Dr. Neha Ahlawat		
	Teacher(s) (Alphabetically)	Prof. B. P. Chamola, Dr. Pato Kumari, Dr. Yogesh Gupta, Dr. Manish Kumar Bansal, Dr. Nisha Shukla, Dr. Aradhana Narang, Dr. Amit Srivastava, Dr. Lakhveer Kaur, Dr. Neha Ahlawat		

COURSE OUTCOMES:		**COGNITIVE LEVELS**
After pursuing the above mentioned course, the students will be able to:		
C201.1	explain the basic concepts of probability, conditional probability and Bayes' theorem	Understanding Level (C2)
C201.2	identify and explain one and two dimensional random variables along with their distributions and statistical averages	Applying Level (C3)
C201.3	apply some probability distributions to various discrete and continuous problems.	Applying Level (C3)
C201.4	solve the problems related to the component and system reliabilities.	Applying Level (C3)
C201.5	identify the random processes and compute their averages.	Applying Level (C3)
C201.6	solve the problems on Ergodic process, Poisson process and Markov chain.	Applying Level (C3)

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.	8

		Bivariate random variable, joint, marginal and conditional distributions, covariance and correlation.	
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 3-4 will apply the concepts probability distributions to various discrete and continuous problems 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.

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	3	2	2	1								2		
C201.2	3	3	1	1								3		
C201.3	3	3	2	1								3		
C201.4	3	3	3	2								2		
C201.5	3	3	2	1								2		
C201.6	3	3	2	1								2		
Avg	3	3	2	1								2		

Detailed Syllabus
Lab Session-wise Breakup

Subject Code	15B17CI471	**Semester Even** **(specify ~~Odd~~/Even)**	**Semester** IV **Session** 2022-2023 **Month from:** Jan **to** June 2023
Subject Name	Algorithms and Problem Solving Lab		
Credits	**1**	**Contact Hours**	**2**

Faculty (Names)	**Coordinator(s)**	Tribhuwan Kumar Tewari(62), Dr. Nitin Shukla(128)
	Teacher(s) (Alphabetically)	**J62:** Anita Sahu, Ankita Wadhwa, Bharat Gupta, Dhanalekshmi G, Dipti Singh, Himanshu Patnaik, Kirti Jain, Purti Kohli, Pratistha Verma, Sherry Garg, Suma Dawn, Taj Alam , Tribhuwan K Tewari, Vikash **J128:** Akanksha Mehndiratta, Himani Bansal, Pulkit Mehndiratta, Raju Pal, Shikha Mehta, Surendra Kumar

COURSE OUTCOMES		**COGNITIVE LEVELS**
C274.1	Choose and define appropriate data structure to a given problem	Remember Level (Level 1)
C274.2	Understand various data structures and algorithm design techniques with the help of examples.	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	Analyze the algorithm by their complexity using asymptotic analysis.	Analyze Level (Level 4)
C274.5	Evaluate the correctness and complexity of the algorithm for a given problem.	Evaluation Level (Level 5)
C274.6	Formulate, elaborate and design an efficient solution to a given problem using appropriate data structure and algorithm design technique	Evaluation Level (Level 5)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
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	CO1, CO2, CO3, CO4
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.	CO3, CO5
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 Hamming coding and Shannon-Fano coding, etc.	CO3, CO5
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	CO3, CO5
5.	Dynamic Programming	Fundamentals of Dynamic programming based solution approach; 0/1 Knapsack ; Shortest path using Floyd Warshall; Coinage problem; Matrix Chain Multiplication; Longest	CO3, CO5

		common subsequence; Longest increasing sequence, String editing	
6.	String Algorithms	Naïve String Matching, Finite Automata Matcher, Rabin Karp matching algorithm, Knuth Morris Pratt, Tries; Suffix Tree; and Suffix Array	CO3, CO5
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*)	CO3, CO5
8.	Case-study / Assignment / Mini-Project	Designing an efficient solution to a given problem using appropriate data structure and algorithm design technique	CO5, CO6

Evaluation Criteria

Components	**Maximum Marks**
Lab Test 1	**20**
Lab Test 2	**20**
Evaluation 1	**10**
Evaluation 2	**10**
PBL/Mini Project	**25**
Attendance	**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. **(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; 3 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

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 ,Soundlikeyourself 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

Detailed Syllabus
Lecture-wise Breakup

Course Code	**15B1NHS431**	**Semester: EVEN**	**Semester IV** Session **2022-2023** **Month: January 2023 to June 2023**
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 (Assignment, Project and class description)
Total	**100**

Project Based Learning:

The students take up a project in a group of 4-5. The Project consists of 2 components: A Digital Poster & a Report. The students pick a text (Novel /Play) of their choice which has not been covered in the syllabus. The analysis of the text is to be submitted in the form of a Narrative Digital Poster. The analysis should include: Introduction, Objectives/Research Questions, Background Study / literature review, Method/ Discussion(Themes, Narrative Structure, Plot in the context of Conflicts, Freitag's model and any 3 Major Literary Devices used by the writer and application of Psychoanalysis) & Analysis. The students should identify the themes in context of the following: a)Different spectrum of life as explored in the text b) Human behavior as exhibited in the text c) Cultural aspects as portrayed in the text d) Moral consciousness of an individual and the society as analysed in the text. The project includes a brief 2-3 pages report which should highlight the following: a) The Names of the team members along with individual contribution in the whole. b) The channels undertaken for team coordination and for remote collaboration.c) Challenges faced and Lessons learnt in virtual coordination/communication. d) Rationale for choosing the particular text. e) Abstract of the entire poster in 250 words, highlighting introduction, objectives, methodology adopted, discussion, analysis and conclusion. f) Learning of the team from the poster based project work done. g) Relevance of the findings/ study for the society and future h) Limitations of the study done.

Recommended Reading material:	
1	John E. Eck, '*Writing with Sweet Clarity'* 1st Edition. Routledge. 2022 https://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	Wolfgang Clemen, '*Shakespeare's Soliloquies'*, First Edition, Routledge, London, 1987.

Detailed syllabus
Lecture-wise Breakup

Subject Code	**15B1NHS432**	**Semester: Even**	**Semester IV Session 2022-2023** **Months: from Jan. to June 2022**
Subject Name	**INTRODUCTION TO PSYCHOLOGY**		
Credits	**3**	**Contact Hours**	**(2-1-0)**
Faculty (Names)	**Coordinator(s)**	Dr. Badri Bajaj Dr. Shweta Verma	
	Teacher(s) (Alphabetically)	Dr. Badri Bajaj Dr. Shweta Verma	

COURSE OUTCOMES		**COGNITIVE LEVELS**
C206-6.1	Demonstrate a basic understanding of different perspectives and concepts of psychology	Understanding (Level 2)
C206-6.2	Apply the concepts of psychology in day to day life	Applying (Level 3)
C206-6.3	Examine the different theoretical perspectives and models of psychology	Analyzing (Level 4)
C206-6.4	Develop solutions for problems related to psychology using appropriate tools/models	Creating (Level 6)

Module No.	**Subtitle of the Module**	**Topics in the module**	**No. of Lectures for the module**
1.	**Introduction to Psychology**	Definition, Nature, and Scope of Psychology; Approaches: Biological, Psychodynamic, Behaviorist, and Cognitive. Methods: Experimental, Observation and Case study; Fields of application.	**3**
2.	**Basic Concepts**	Person, Consciousness, Behavior and Experience, Perception and learning	**5**
3.	**Memory**	Process of Memory: Encoding, Storage, Retrieval; Stages of Memory: Sensory, Short term and Long term	**3**
4.	**Motivation**	Motives: Intrinsic and Extrinsic Frame Work, Theories of Motivation; Techniques of Assessment of Motivations; Frustration and Conflict.	**3**
5.	**Emotions**	Concept, Development, Expression, Theories of Emotions.	**2**
6.	**Intelligence**	Nature, Theories, Measurement and Approaches - Genetic and Environmental	**3**
7.	**Personality**	Nature, Approaches, Determinants and Theories; Techniques of Assessment: Psychometric and Projective Techniques.	**5**

8.	**Psychology of Adjustment**	Psychological Disorders: Anxiety, Stress, Depression; Psychotherapies.	**4**
		Total:	**28**

Evaluation Criteria

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

Project based learning: Students in a group will choose a research topic from the syllabi of psychology. Students will cover the following points to prepare project reports: Understanding of concept, related theories and perspectives; describe the relevance of the chosen concept for personal growth; discuss the application of chosen topic for their professional life; elaborate the relevance of the topic at group level and societal level. Discussions on these practical aspects will enhance students' understanding & application of concepts of psychology in day to day life.

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.	R.A. Baron and G. Misra, Psychology, 5th Ed., Pearson, 2015
2.	S. Nolen-Hoeksema, B. L. Fredrickson, G. R. Loftus, and C. Luts, Introduction to Psychology, 16th Ed., Cengage Learning, 2014.
3.	S. K. Ciccarelli and G. E. Meyer, Psychology, Pearson, 5th Ed., 2017.
4.	Clifford Morgan, Richard King, John Weisz, John Schopler, Introduction to Psychology, 7th Ed., McGraw Hill Education, 2017.
5.	S. Pandit, Introduction to Psychology, 1st Ed., SAGE Publications; 2022
6.	Gregory Feist and Erika Rosenberg, Psychology: Perspectives and Connections, 5th Ed., McGraw-Hill Education, 2021

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** 2022 -2023 **Month from** Jan 2023 to June 2023
Course Name	Principles of Management		
Credits	**3**	**Contact Hours**	2-1-0

Faculty (Names)	**Coordinator(s)**	Dr. Shirin Alavi
	Teacher(s) (Alphabetically)	Dr. Shirin Alavi

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**:2022-23 **Month from**: Jan-June 2023
Course Name	Financial Accounting		
Credits	3	Contact Hours	3 (2-1-0)

Faculty (Names)	**Coordinator(s)**	Dr. Mukta Mani (Sec-62), Dr. Sakshi Varshney (Sec-128)
	Teacher(s) (Alphabetically)	Dr. Mukta Mani, 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** 2022-23 **Month from** Jan-June
Course Name	DIGITAL SYSTEMS		
Credits	4	**Contact Hours**	3+1

Faculty (Names)	**Coordinator(s)**	Atul Kumar, Monika
	Teacher(s) (Alphabetically)	Abhishek Kashyap, Gaurav Khanna, Jasmine Saini, Mandeep, Reema Budhiraja, Ruby Beniwal and Shradha Saxena

COURSE OUTCOMES		**COGNITIVE LEVELS**
C207.1	Familiarize with the fundamentals of number system, Boolean algebra and Boolean function minimization techniques.	Applying Level (C3)
C207.2	Analyze and design combinational circuits using logic gates.	Analyzing Level (C4)
C207.3	Analyze state diagram and design sequential logic circuits using flip flops.	Analyzing Level (C4)
C207.4	Understand the classification of signals & systems and learn basic signal operations & Fourier analysis.	Analyzing Level (C4)
C207.5	Understand various steps involved in digitization and transmission of a signal.	Understanding Level (C2)

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: 2022-2023
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 (C2)
C206-9.2	Assess the different political ideologies.	Evaluate (C5)
C206-9.3	Assess the concept of state and different theories of state.	Evaluate (C5)
C206-9.4	Demonstrate an understanding of democracy and models of democracy.	Understand (C2)

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? • Importance of Studying Political Science	6
2.	Ideologies	• Liberalism & Conservativism • Socialism & Anarchism • Nationalism & Fascism • Feminism & Multiculturalism	8
3.	State	• What is State • Theories of State • Role of State	8

4.	Democracy	• Defining Democracy • Models of Democracy • 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 and issues around it. This will enhance the research skills of the students in regard to Indian politics and political system.

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.