

Detailed Syllabus

Lecture-wise Breakup

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|---------------------|--------------------------------|--|--|
| Subject Code | 15B11CI411 | Semester Even (specify Odd/Even) | Semester IV Session 2019 -2020 Month from: Jan to June 2020 |
| Subject Name | Algorithms and Problem Solving | | |
| Credits | 3 | Contact Hours | 3 |

| | | |
|------------------------|------------------------------------|--|
| Faculty (Names) | Coordinator(s) | Sherry Garg (J62), Varsha Garg (J128) |
| | Teacher(s) (Alphabetically) | J62 – Ankita Wadhwa, Kashav Ajmera, Dr. Manish K Thakur, Dr. Sangeeta Mittal, Sherry Garg J128 – Payal K Batra, Pulkit Mehendiratta, Rashmi Kushwaha, Varsha Garg |

| COURSE OUTCOMES | | COGNITIVE LEVELS |
|------------------------|--|-------------------------|
| C214.1 | Analyze 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 | 6 |
| 2. | Search Trees and | Search Trees: Segment tree, Interval Tree, and RB Tree; | 6 |

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|--------------------------|--|---|----|
| | Priority Queue | Priority queue using Binomial and Fibonacci Heap | |
| 3. | 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. | 2 |
| 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; 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-Fano coding, etc. | 6 |
| 5. | 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 | 4 |
| 6. | 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 | 6 |
| 7. | String Algorithms | Naïve String Matching, Finite Automata Matcher, Rabin Karp matching algorithm, Knuth Morris Pratt, Tries; Suffix Tree; and Suffix Array | 6 |
| 8. | 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*) | 4 |
| 9. | Tractable and Non-Tractable Problems | Efficiency and Tractability, P, NP, NP-Complete, NP- Hard problems | 2 |
| Total number of Lectures | | | 42 |
| Evaluation Criteria | | | |
| Components | | Maximum Marks | |
| T1 | | 20 | |
| T2 | | 20 | |
| End Semester Examination | | 35 | |
| TA | | 25 (Attendance (7), Online Test on CP Portal (7), Mini-project (6), Assignments(5)) | |
| Total | | 100 | |

| 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

Lab Session-wise Breakup

| | | | |
|---------------------|------------------------------------|--|--|
| Subject Code | 15B17CI471 | Semester Even (specify Odd/Even) | Semester IV Session 2019 -2020 Month from: Jan to June 2020 |
| Subject Name | Algorithms and Problem Solving Lab | | |
| Credits | 1 | Contact Hours | 2 |

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|------------------------|------------------------------------|--|
| Faculty (Names) | Coordinator(s) | Manish Kumar Thakur / Ankita Wadhwa (J62) and Rashmi Kushwah (J128) |
| | Teacher(s) (Alphabetically) | J128: Avinash Pandey , Neeraj Jain, Payal Khurana Batra, Pulkit Mehndiratta, Swati Gupta, Rashmi Kushwah, Varsha Garg |

| 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. | | Evaluate Level (Level 5) |
| C274.6 | Formulate, elaborate and design an efficient solution to a given problem using appropriate data structure and algorithm design technique | | Create Level (Level 6) |
| 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 | C274.1, C274.4 |
| 2. | Search Trees and | Search Trees: Segment tree, Interval Tree, and RB Tree; | C274.1, |

| | | | |
|--------------------------------|--|--|-------------------|
| | Priority Queue | Priority queue using Binomial and Fibonacci Heap | C274.2 |
| 3. | 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. | C274.3, C274.5 |
| 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; 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. | C274.3, C274.5 |
| 5. | 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 | C274.3, C274.5 |
| 6. | 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 | C274.3, C274.5 |
| 7. | String Algorithms | Naïve String Matching, Finite Automata Matcher, Rabin Karp matching algorithm, Knuth Morris Pratt, Tries; Suffix Tree; and Suffix Array | C274.3, C274.5 |
| 8. | 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*) | C274.3, C274.5 |
| 9. | Project Evaluation | Designing an efficient solution to a given problem using appropriate data structure and algorithm design technique | C274.6 |
| Evaluation Criteria | | | |
| Components | | Maximum Marks | |
| Lab Test 1 | | 20 | |
| Lab Test 2 | | 20 | |
| Evaluations (2 numbers) | | 10 (each evaluation of 5 marks, i.e. 5*2 = 10 Marks) | |
| Quiz (2 numbers) | | 20 (each quiz of 10 marks, i.e. 10*2 = 20 Marks) | |
| Mini Project | | 15 | |
| Attendance | | 15 | |
| 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. | 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, 1978 |
| 5. | Sedgewick, Algorithms in C, 3rd edition. Addison Wesley, 2002 |
| 6. | Weiss, Data Structures and Algorithm Analysis in C, Benjamin and Cummings Pub., 1994 |
| 7. | 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

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|--------------------|-----------------------------------|------------------------|---|
| Course Code | 15B1NHS431 | Semester : EVEN | Semester IV Session 2019-2020 Month: January 2020 to June 2020 |
| Course Name | Introduction to Literature | | |
| Credits | 3 | Contact Hours | 3 (2-1-0) |

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|------------------------|--|--|
| 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 | 5 |

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|--------------------------|-----------------------|--|----|
| | | Literary Devices Learning Communication Skills through Literature | |
| 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, Seminar/Presentation , Oral Questions) | |
| Total | | 100 | |

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| Recommended Reading material: | |
| 1 | M.H. Abrams, ‘A Glossary of Literary Terms’, 7 th Edition, Hienle & Hienle: Thomson Learning, USA, 1999 |

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|---|---|
| 2 | Mark William Roche, ' <i>Why Literature matters in the 21st Century</i> ', First Edition, Yale University Press, 2004. |
| 3 | E.R. Braithwaite, ' <i>To Sir With Love</i> ', First Edition, Bodley Head, UK, 1959. Susie Thomas(Ed), "E. R. Braithwaite: 'To Sir, with Love' – 1959", Available at http://www.londonfictions.com |
| 4 | Khalid Hasan (Translator), ' <i>Saadat Hasan Maanto : Toba Tek Singh</i> ' Reprint, Penguin Books, India, 2008. |
| 5 | G.B Shaw, ' <i>Arms & The Man</i> ', Paperback, 2013 https://onemorelibrary.com/index.php/en/?option=com_djclassifieds&format=raw&view=download&task=download&fid=10428 |
| 6 | Anon, (n.d.). <i>The Spectator Club. Sir Richard Steele. 1909-14. English....</i> [online] Available at: http://www.bartleby.com/27/7.html [Accessed 2018]. |
| 7 | <i>All poems online:</i> http://www.poetryfoundation.org |
| 8 | Wolfgang Clemen, ' <i>Shakespeare's Soliloquies</i> ', First Edition, Routledge, London, 1987. |

Detailed Syllabus
Lecture-wise Breakup

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|--------------------|--|---|---|
| Course Code | 16B1NHS332 | Semester : ODD (specify Odd/Even) | Semester : IV Session 2019 -2020 Month from: July-December |
| Course Name | Quantitative Methods for Social Sciences | | |
| Credits | 03 | Contact Hours | 2-1-0 |

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|------------------------|---------------------------------------|---------------------|
| Faculty (Names) | Coordinator(s) | Manas Ranjan Behera |
| | Teacher(s) (Alphabetically) | Manas Ranjan Behera |

| COURSE OUTCOMES | | COGNITIVE LEVELS |
|--|---|---------------------------|
| After pursuing the above mentioned course, the students will be able to: | | |
| C206-3.1 | <i>Demonstrate</i> the key concepts of different quantitative methods used in social sciences. | Understanding Level- (C2) |
| C206-3.2 | <i>Classify and summarize the</i> data to be used for analysis. | Understanding Level- (C2) |
| C206-3.3 | <i>Apply</i> the theoretical concept to perform basic data analysis in social sciences. | Apply Level –(C3) |
| C206-3.4 | <i>Examine</i> different statistical methods and be able to discuss the merits and limitations of a particular method | Analyze Level –(C4) |
| C206-3.5 | <i>Recommend</i> appropriate conclusions following empirical analysis | Evaluation Level- (C5) |

| Module No. | Title of the Module | Topics in the Module | No. of Lectures for the module |
|-------------------|----------------------------|--|---------------------------------------|
| 1. | Introduction | Introduction to Quantitative Methods, Classification & Presentation of Data: Tabulation-Types of Table, Diagrammatical and Graphical presentation. | 3 |
| 2. | Mathematical | Mathematical basis of Managerial Decision-Concepts, | 3 |

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|---------------------------------|-----------------------|---|-----------|
| | Concepts | Frequency Distribution and their Analysis | |
| 3. | Statistical Concepts | Measures of Central Tendency, Measures of Dispersion, Measures of Association, Sampling and sample size estimation, Point estimation, Statistical Intervals based on Single sample. | 4 |
| 4. | Hypothesis Testing | Hypothesis Testing based on single sample, Inferences based on Two samples, t, Z and chi- square and F tests | 8 |
| 5. | Regression Analysis | Simple Linear Regression and Correlation, Multiple Regression Model | 3 |
| 6. | Time Series Analysis | Trend Projection, Moving averages and Exponential smoothing Techniques, Index Numbers | 3 |
| 7. | Multivariate Analysis | ANOVA, MANOVA, Factor Analysis, Discriminant Analysis | 4 |
| Total number of Lectures | | | 28 |
| Evaluation Criteria | | | |
| Components | | Maximum Marks | |
| T1 | | 20 | |
| T2 | | 20 | |
| End Semester Examination | | 35 | |
| TA | | 25 (Quiz+ Assignment+Viva-voce) | |
| Total | | 100 | |

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|---|--|
| 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. | Sirkin, RM. Statistics for the Social sciences. 3rd ed. Thousand Oaks, Calif: Sage Publications; 2006. |
| 2. | Montgomery, DC. , George C. Runger. Applied statistics and probability for engineers. 3rd ed. Hoboken, NJ: Wiley.,2007 |
| 3. | Healey, JF. Statistics: A Tool for Social Research. 9th ed. Calif: Wadsworth Cengage Learning; 2012. |

Detailed Syllabus
Lecture-wise Breakup

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|--------------------|---------------------------|--|--|
| Course Code | 16B1NHS431 | Semester Even (specify Odd/Even) | Semester IV Session 2019-20 Month from Jan-June |
| Course Name | HUMAN RESOURCE MANAGEMENT | | |
| Credits | 3(LTP: 2-1-0) | Contact Hours | 3 |

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|------------------------|---------------------------------------|--------------------------|
| Faculty (Names) | Coordinator(s) | Dr. Praveen Kumar Sharma |
| | Teacher(s) (Alphabetically) | Dr. Praveen Kumar Sharma |

| COURSE OUTCOMES | | COGNITIVE LEVELS |
|------------------------|---|-------------------------|
| CO1 | Demonstrate a basic understanding of different functions of human resource management: Employer Selection, Training and Learning, Performance Appraisal and Remuneration, Human Relations and Industrial Relations. | Understand Level (C2) |
| CO2 | Apply various tools and techniques in making sound human resource decisions. | Apply level (C3) |
| CO3 | Analyze the key issues related to administering the human resource management activities such as recruitment, selection, training, development, performance appraisal, compensation and industrial relation. | Analyze Level (C4) |
| CO4 | Critically assess and evaluate different human resource & industrial relation practices and techniques and recommend solutions to be followed by the organization | Evaluate Level (C5) |

| Module No. | Title of the Module | Topics in the Module | No. of Lectures for the module |
|-------------------|----------------------------|---|---------------------------------------|
| 1. | Introduction | Introduction to Human Resource Management and its definition, HRM functions and its relation to other managerial functions, Nature, Scope and Importance of Human Resource Management in Industry, Role & position of Personnel function in the organization. Human Resource Planning | 3 |
| 2. | Employer Selection | Recruitment Process; Selection Process - Job and Worker Analyses, Matching Job with the Person; Selection Methods - Application Blank, Biographical Inventories, References and Recommendation Letters, Interviews | 8 |
| 3. | Training and Learning | Need Identification; Psychological Factors in Learning; Training Methods in the Workplace; Effective Training Programme | 6 |

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|--------------------------|---|---|----|
| 4. | Performance Appraisal and Remuneration | Different methods of Performance Appraisal, Basic concepts in wage administration, company's wage policy, Job Evaluation, Issues in wage administration, Bonus & Incentives | 6 |
| 5. | Human Relations and Industrial Relations, Trends in Human Resource Management | Factors influencing industrial relations - State Interventions and Legal Framework - Role of Trade unions - Collective Bargaining - Workers' participation in management. Trends in Human Resource Management: Analytics, Artificial Intelligence | 5 |
| Total number of Lectures | | | 28 |
| Evaluation Criteria | | | |
| Components | | Maximum Marks | |
| T1 | | 20 | |
| T2 | | 20 | |
| End Semester Examination | | 35 | |
| TA | | 25(Project, Quiz) | |
| Total | | 100 | |

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|--|--|
| 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. | VSP Rao, Human Resource Management: Text and Cases, Excel Books, 2002, 2nd Edition |
| 2. | K. Aswathappa, Human Resource Management: Text and Cases, 8th Edition, Published by Mc Graw-Hill |
| 3. | Dessler, Gary and Varkkey, Biju., Human Resource Management, 14th Edition published by Pearson Education Ltd. 2017 |

Detailed Syllabus

Lecture-wise Breakup

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|--------------------|----------------------|--|--|
| Course Code | 15B1NHS435 | Semester Odd (specify Odd/Even) | Semester Session 2019 - 2020 Month from Jan-June 2020 |
| Course Name | Financial Accounting | | |
| Credits | 3 | Contact Hours | 3 (2,1,0) |

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|------------------------|--|--|
| 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 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 | 3 |

| | | | |
|--------------------------|-----------------------------------|--|----|
| 2. | Understanding Accounting Elements | Elements of Financial Statements- Assets, Current assets, Liabilities, Current liabilities, Equity, Income, Expenses, Accounting Equation | 4 |
| 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) | 4 |
| 4. | Journal Transactions | Journal, Rules of Debit and Credit, Compound Journal entry, Opening entry | 5 |
| 5. | Ledger Posting and Trial Balance | Ledger, Posting, relationship between Journal and Ledger, Rules regarding Posting, Trial balance | 5 |
| 6. | Rectification of Errors | Different types of errors, their effect on trial balance, rectification and preparation of suspense account | 3 |
| 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 | 2 |
| Total number of Lectures | | | 28 |
| Evaluation Criteria | | | |
| Components | | Maximum Marks | |
| T1 | | 20 | |
| T2 | | 20 | |
| End Semester Examination | | 35 | |
| TA | | 25 (Quiz + Class test +Class Participation) | |
| 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. | Text Books: Maheshwari S. N., Financial and Management Accounting, 5th Ed., S. Chand & Sons |

| | |
|-----------|---|
| | Publication, 2014. ISBN No.: 978-81-8054-529-0 |
| 2. | Reference Book: Ghosh, T.P., Financial Accounting for Managers, 4th Ed., Taxmann Publications, 2009 |

Detailed Syllabus

Lecture-wise Breakup

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|------------------------|------------------------------------|---|--|
| Subject Code | 15B11HS111 | Semester: EVEN | Semester 1 Session 2019-2020 Month from Jan to June |
| Subject Name | LIFE SKILLS | | |
| Credits | 2(1-1-0) | Contact Hours | 2 |
| Faculty (Names) | Coordinator(s) | Dr. Santosh Dev and Dr. Praveen Sharma | |
| | Teacher(s) (Alphabetically) | Dr.Akarsh Aroro,Dr. Amandeep, Dr. Kanupriya, Dr Praveen Sharma, Ms. Puneet Pannu, Dr. Santosh Dev | |

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| COURSE OUTCOMES: The students will be able to: | | COGNITIVE LEVELS |
| C209.1 | Understand Life Skill required to manage self and one's environment | Understand (C2) |
| C209.2 | Apply comprehensive set of skills for life success for self and others | Apply (C3) |
| C209.3 | Analyze group dynamics for its effective functioning | Analysing (C4) |
| C209.4 | Evaluate the role of women leadership and gender issues | Evaluate (C5) |
| | | |

| Module No. | Subtitle of the Module | Topics in the module | No. of Lectures for the module |
|------------------------------|------------------------|---|--------------------------------|
| 1. | Introduction | Introduction to Life Skills; basic Concepts and Relevance for Engineers | 1 |
| 2. | Individual-1 | Emotional Intelligence, Stress Management, Goal Setting | 4 |
| 3. | Individual-II | Personality, Values and Attitudes, Assertiveness, Well being, | 3 |
| 4. | Group Dynamics | Group, Group types, Group Relationship, Social Loafing, Social Facilitation | 3 |
| 5. | Women Leadership | Gender Sensitization, Women Leadership. | 3 |
| Total number of Hours | | | 14 |

Evaluation Criteria

| Components | Maximum Marks |
|--------------------------|---|
| T1 | 20 |
| T2 | 20 |
| End Semester Examination | 35 |
| TA | 25 (Assignment, Presentatons and class participation) |
| 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. | Stephen P. Robbins, Organizational Behaviour, 9 th Edition, Prentice-Hall India 2001 |
| 2. | Smith, E., Hoeksema, S., Fredrickson, B., & Loftus, G. Introduction to Psychology. Thompsons and Wadsworth Co, 2003 |
| 3. | Daniel Goleman, Working With Emotional Intelligence, Bantom Books 1998 |
| 4. | Sue Bishop, Assertiveness Skills Training, Viva Books, New Delhi, 2004 |
| 5. | Adele B. Lynn 50 Activities for Developing Emotional Intelligence, Ane Books, 2003 |
| 6. | Sivasailam Thiagarajan, Glenn M. Parker; Teamwork and Teamplay, Games and Activities for |

| | |
|-----------|---|
| | Building and Training Teams., Jossey-Bass, 1999 |
| 7. | Kaul A.& Singh M., <i>"New Paradigms for Gender Inclusivity"</i> , PHI Pvt Ltd (2012) |

Detailed syllabus

Lecture-wise Breakup

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|------------------------|------------------------------------|--------------------------------------|---|
| Subject Code | 15B1NHS432 | Semester: Even | Semester IV Session 2019-2020 Months: from Jan to June |
| Subject Name | INTRODUCTION TO PSYCHOLOGY | | |
| Credits | 3 | Contact Hours | (2-1-0) |
| Faculty (Names) | Coordinator(s) | Dr. Badri Bajaj and Dr. Ruchi Gautam | |
| | Teacher(s) (Alphabetically) | Dr. Badri Bajaj Dr. Ruchi Gautam | |

| COURSE OUTCOMES | | COGNITIVE LEVELS |
|------------------------|--|----------------------------|
| CO1 | Demonstrate a basic understanding of different perspectives and concepts of psychology | Understanding (Level 2) |
| CO2 | Apply the concepts of psychology in day to day life | Applying (Level 3) |
| CO3 | Examine the different theoretical perspectives and models of psychology | Analyzing (Level 4) |
| CO4 | 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, | 3 |

| | | | |
|--------------------------|---------------------------------------|---|----|
| | | Observation and Case study; Fields of application. | |
| 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 (Assignment, Quiz, Oral Questions) | | |
| 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. | 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, 5 th Ed., 2017. |

Detailed Syllabus

Lecture-wise Breakup

| | | | |
|--------------------|--------------------------|-----------------------|--|
| Course Code | 15B1NHS434 | Semester: Even | Semester IV Session 2019 -2020 Month from Jan 2020 to June 2020 |
| 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 | 7 |

| | | | |
|---------------------------------|-------------|---|-----------|
| | | 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 . | |
| 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 | 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, Managerial Effectiveness. | 7 |
| 4. | Directing | Scope, Human Factors, Creativity and Innovation, Harmonizing Objectives, Leadership, Types of Leadership Motivation, Hierarchy of Needs, Motivation theories, Motivational Techniques, Job Enrichment, Communication, Process of Communication, Barriers and Breakdown, Effective Communication, Electronic media in Communication. | 4 |
| 5. | Controlling | System and process of Controlling, Requirements for effective control, The Budget as Control Technique, Information Technology in Controlling, Productivity, Problems and Management, Control of Overall Performance, Direct and Preventive Control, Reporting, The Global Environment, Globalization and Liberalization, International Management and Global theory of Management. | 5 |
| Total number of Lectures | | | 28 |
| Evaluation Criteria | | | |
| Components | | Maximum Marks | |
| T1 | | 20 | |
| T2 | | 20 | |

| | |
|--------------------------|--------------------------------------|
| End Semester Examination | 35 |
| TA | 25 (Project, Class Test, 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. | Koontz H, Weihrich H. Essentials of management: an international, innovation, and leadership perspective. McGraw-Hill Education; 10 th Edition 2018. |
| 2. | Tripathi PC. Principles of management. Tata McGraw-Hill Education; 6 th Edition 2017. |
| 3. | Principles of Management Text and Cases, Pravin Durai , Pearson ,2015 |
| 4. | Robbins, S.P. & Decenzo, David A. Fundamentals of Management,7 th ed., Pearson, 2010 |
| 5. | Robbins, S.P. & Coulter, Mary Management; 14 ed.,Pearson , 2009 |

Detailed Syllabus

Lecture-wise Breakup

| | | | |
|--|---|---|---|
| Course Code | 15B11MA301 | Semester Even | Semester IV Session 2019-2020 Month from Jan 2020- June 2020 |
| Course Name | Probability and Random Processes | | |
| Credits | 4 | Contact Hours | 3-1-0 |
| Faculty (Names) | Coordinator(s) | | |
| | Teacher(s) (Alphabetically) | | |
| 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. 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 | |
| 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, 3 rd 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. | | |

Detailed Syllabus

Lecture-wise Breakup

| | | | |
|--------------------|------------------------|---|---|
| Course Code | 18B11EC213 | Semester Even (specify Odd/Even) | Semester 4th Session 2019 -2020 Month from Jan-June |
| Course Name | Digital Systems | | |
| Credits | 4 | Contact Hours | 3+1 |

| | | |
|------------------------|--|---|
| Faculty (Names) | Coordinator(s) | Garima Kapur, Atul Kumar |
| | Teacher(s) (Alphabetically) | Amit Kumar Goyal, Ankur Bhardwaj, Vishal Saxena |

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

| Module No. | Title of the Module | Topics in the Module | No. of Lectures for the module |
|-------------------|--|---|---------------------------------------|
| 1. | Boolean Function Minimization Techniques and Combinational | Number systems, Karnaugh Map, Quine-McCluskey method, Prime Implicants, Essential Prime implicants, Adder, Subtractor, Multiplexer, Demultiplexer, Encoder, Decoder, Comparator and Code Converters | 9 |

| | | | |
|----------------------------|---|--|-----------|
| | Circuits | | |
| 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 of Counters 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 and discrete time, Even and odd, periodic and non-periodic, Energy and Power signals, Basic signals: unit impulse, unit step and unit ramp. Basic operations of signals: time scaling, time- shifting, etc. Systems and classification of systems: 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. Discrete Fourier Transform (DFT), Properties and DFT, standard signal pairs. | 5 |
| 6. | Sampling and Pulse code modulation | Sampling theorem, Proof of sampling theorem, Nyquist rate and Nyquist interval. Quantization (Mid rise and Mid tread), Quantization error, PCM (modulator and demodulator), Transmission bandwidth in PCM, Signal to quantization noise ratio of PCM. | 6 |
| 7. | Digital modulation techniques and Line coding | BASK, BFSK and BPSK modulation techniques with modulator and demodulator. Linear DM and basics of ADM. Line coding formats- UNRZ, URZ, BNRZ, BRZ, AMINRZ, AMI-RZ and Manchester. | 5 |
| | | 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 |

| 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. | Salivahanan, S., 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-Hall Englewood 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 Higher Education. 3 edition (September 2007) |

Detailed Syllabus

Lecture-wise Breakup

| | | | |
|--------------------|---------------------|---|--|
| Course Code | 18B15EC213 | Semester -: Even (specify Odd/Even) | Semester-: IV, Session 2019 -2020 Month- : January - May |
| Course Name | Digital Systems Lab | | |
| Credits | 2 | Contact Hours | 2 |

| | | |
|------------------------|-----------------------|---|
| Faculty (Names) | Coordinator(s) | Satyendra Kumar & Ankur Bhardwaj |
| | Teacher(s) | Abhay Kumar, Abhishek Kashyap, Atul Kumar, Bhawana Gupta, Garima Kapoor, Kapil Dev Tyagi, Parul Arora, Raghvendra Singh, Varun Goel, Vinay Anand Tikkiwal, Vishal Narain Saxena |

| COURSE OUTCOMES | | COGNITIVE LEVELS |
|------------------------|--|-------------------------|
| C208.1 | Develop the MATLAB programs based on the concept of combinational digital circuits. | Applying (C3) |
| C208.2 | Develop the MATLAB programs to apply the theory of sequential digital circuits. | Applying (C3) |
| C208.3 | Experiment with MATLAB to apply the theory of signals & systems and digital signal processing. | Applying (C3) |
| C208.4 | Experiment with MATLAB to apply the concept of digital communication. | Applying (C3) |

| Module No. | Title of the Module | List of Experiments | COs |
|-------------------|-----------------------------------|---|------------|
| 1. | Introduction to basic logic gates | Write Matlab programs for the verification of truth tables of basic logic gates and their realization | C208.1 |

| | | | |
|----|--|---|--------|
| | | using universal logic gates. | |
| 2. | Basics of adder and subtractor circuits | Write Matlab programs for half adder, half subtractor, full adder, and full subtractor. | C208.1 |
| 3. | Decoder logic circuits | Write Matlab programs for the design of 2-to-4 decoder and 3-to-8 decoder. | C208.1 |
| 4. | Multiplexer logic circuits | Write Matlab programs for the design of 2-to-1, 4-to-1, and 8-to-1 multiplexers. | C208.1 |
| 5. | Introduction to sequential circuit: SR-Latch | Realization of SR Latch using MATLAB-Simulink. | C208.2 |
| 6. | Introduction to sequential circuit: D-Flip-flop | Realization of D Flip-Flop using MATLAB-Simulink. | C208.2 |
| 7. | Introduction to sequential circuit: JK-Flip-flop | Realization of JK Flip-Flop using MATLAB-Simulink. | C208.2 |
| 8. | Continuous time and discrete time signals | Write Matlab programs for the generation of elementary continuous time signals and discrete time signals. | C208.3 |
| 9. | Sampling and reconstruction | Write Matlab program to study the sampling and reconstruction process. | C208.3 |

| | | | |
|----------------------------------|--|---|----------------|
| | process | | |
| 10. | Quantization process of the signals. | Write Matlab program to study the quantization process of sinusoid signals. | C208.3 |
| 11. | Digital Modulation Techniques | Write Matlab programs to study the binary phase shift keying and frequency shift keying modulation process. | C208.4 |
| 12. | Introduction to Discrete Fourier Transform (DFT) and Inverse Discrete Fourier Transform (IDFT) | Write Matlab programs to compute Discrete Fourier Transform (DFT) and Inverse Discrete Fourier Transform (IDFT) for the spectral analysis of signals. | C208.3 |
| 13. | Encoder logic circuits | Write Matlab code for 8:3 encoder and priority encoder. | C208.1 |
| 14. | Code Converters | Write Matlab code for Binary to Gray and Gray to Binary Code Converter. | C208.1 |
| Evaluation Criteria | | | |
| Components | | | Maximum |
| Marks | | | |
| Mid Term Viva | | | 20 |
| End Term Viva | | | 20 |
| Report file, Attendance, and D2D | | | 60 |
| 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. | Salivahanan, S., and S. Arivazhagan. <i>Digital circuits and design</i> . Vikas publishing house PVT Limited. Fifth edition (March 2018) |
| 2. | Oppenheim, Alan V., Alan S. Willsky, and Syed Hamid Nawab. "Signals and Systems," <i>Prentice-Hall Englewood Cliffs 2 edition (2015)</i> |
| 3. | S. Haykin <i>Digital Communications Systems</i> John Wiley & Sons, 1 edition,2013 |
| 4. | H. Taub & D. L. Schilling, <i>Principles of Communication Systems</i> , 2nd edition, McGraw-Hill Higher Education. 3 edition (September 2007) |

Detailed Syllabus

Lecture-wise Breakup

| | | | |
|---------------------|------------------------------|----------------------|--|
| Subject Code | 19B13BT211 | Semester: ODD | Semester: IV Session: 2019-2020 Month from: JAN to JUNE |
| Subject Name | Environmental Studies | | |
| Credits | 0 | Contact Hours | 3 |

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|------------------------|---|--|
| Faculty (Names) | Coordinator(s) | 1. Dr. Krishna Sundari S |
| | Teacher(s) (Alphabetically) | 1. Dr. Krishna Sundari S 2. Manisha Singh 3. Dr. Rachana 4. Ms. Ekta Bhat |
| COURSE OUTCOMES | | COGNITIVE LEVELS |
| CO205.1 | Explain diversity of environment, ecosystem resources and conservation. | Understand Level (C2) |
| CO205.2 | Identify hazards related to environmental pollution and safe management practices | Apply Level(C3) |
| CO205.3 | Apply modern techniques for sustainable Urban planning and Disaster management | Apply Level(C3) |
| CO205.4 | Recall Government regulations, Environmental Policies, Laws & ethics | Understand Level (C2) |
| CO205.5 | Survey ground situation on specific environmental aspects, examine risks involved, make a field report and present the findings | Analyzing Level(C4) |

| | | | |
|-------------------|---------------------------------|---|---------------------------------------|
| Module No. | Subtitle of the Module | Topics in the module | No. of Lectures for the module |
| 1. | The Multidisciplinary nature of | Definition, scope and importance, Need for public awareness, Types of Ecosystems, World Biomes, | 6 |

| | | | |
|---------------------------------|--|--|-----------|
| | environment, Biodiversity | Ecosystem functioning, Diversity of flora and fauna, species and wild life diversity, Biodiversity hotspots, threats to biodiversity, Case studies. | |
| 2. | Natural resources, Energy consumption & conservation | Water, Land, Energy (Renewable, non-renewable, wind, solar, hydro, Biomass), Mineral, Forest, & Food resources, Global Conventions on Energy, Kyoto protocol, Case studies. | 10 |
| 3. | Pollution, hazardous waste management | Air, Water & Land, chemical, noise pollution, sources & causes, effects, Electronic waste, nuclear hazards, Case studies. | 8 |
| 4. | Urban planning, human communities, Disaster management | Sustainable building, Disaster Management and Contingency Planning, human population, resettlement, rehabilitation environmental movements, environmental ethics, Critical issues concerning Global environment Urbanization, population growth, global warming, climate change, acid rain, ozone depletion etc Case studies. | 8 |
| 5. | Environmental Policies, Laws, Regulations & ethics | Regulation of technology and innovation, Policy and laws, Different Acts such as: Environmental Protection Act, Air and Water Acts, Wildlife and Forest Acts), US-EPA, National Environmental Policy; Function of pollution control boards (SPCB and CPCB), their roles and responsibilities, Case studies. | 4 |
| 6 | Field Work/ | Explore the current environment related occurrences at national and international level, Study of successful sustainable measures, a know-how of industries in local region and their possible effects, measure of water, air and land quality, Visit to a local polluted site-Urban/Rural /Industrial / Agricultural, Study of simple ecosystems. | 6 |
| Total number of Lectures | | | 42 |

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. | Benny Joseph, Environmental Studies Simplified, 3 rd Edition, McGraw Hill Education, India, Published 2 nd August, 2017 |
| 2. | Erach Bharucha, Textbook of Environmental Studies for UG Courses, 3 rd Edition, Orient Black Swan, Published 1 st Jan 2013 |
| 3. | Issues of the Journal: Down to Earth, Published by Centre for Science and Environment (CSE), Delhi |