

**Detailed Syllabus**  
**Lab-wise Breakup**

|                    |                                |   |   |
|--------------------|--------------------------------|---|---|
| <b>Course Code</b> | 18B15GE111                     | <b>Semester : Odd</b><br>(specify Odd/Even) | <b>Semester: I ; Session</b> 2021-2022<br><b>Month from:</b> September - December |
| <b>Course Name</b> | Engineering Drawing and Design |   |   |
| <b>Credits</b>     | 1.5                            | <b>Contact Hours</b>                        | 3   |

|                        |                                       |   |
|------------------------|---------------------------------------|---|
| <b>Faculty (Names)</b> | <b>Coordinator(s)</b>                 | Mr. Chandan Kumar, Mr. Deepak Kumar   |
|                        | <b>Teacher(s)</b><br>(Alphabetically) | Mrs. Madhu Jhariya, Mr. Nitesh Kumar, Dr. Prabhakar Jha, Mr. Rahul Kumar, Mr. Vimal Saini |

| <b>COURSE OUTCOMES</b> |   | <b>COGNITIVE LEVELS</b>  |
|------------------------|---|--------------------------|
| <b>C178.1</b>          | Recall the use of different instruments used in Engineering Drawing and Importance of BIS and ISO codes.      | Remembering Level (C1)   |
| <b>C178.2</b>          | Illustrate various types of mathematical curves and scale.  | Understanding Level (C2) |
| <b>C178.3</b>          | Classify different types of projection and Construct Orthographic projection of Point, Line, Plane and Solid. | Applying Level (C3)      |
| <b>C178.4</b>          | Construct Isometric Projection and Conversion of Orthographic view to Isometric view and vice-versa.          | Applying Level (C3)      |
| <b>C178.5</b>          | Construct Engineering model in Drawing software (AutoCAD) and Compare it with conventional drawing.           | Analyzing Level (C4)     |

| <b>Module No.</b> | <b>Title of the Module</b>                           | <b>List of Experiments</b>   | <b>CO</b> |
|-------------------|--|--|-----------|
| 1.                | Introduction to Engineering Drawing                  | <ul style="list-style-type: none"> <li>Principles of engineering graphics and their significance, usage of drawing instruments.</li> <li>Technical vertical capital letters which includes English alphabets and numeric.</li> </ul>   | C178.1    |
| 2.                | Engineering Curves                                   | <ul style="list-style-type: none"> <li>Constructing a pentagon and hexagon; engineering curves: Parabola, Ellipse, Hyperbola, Cycloids and Involutives.</li> </ul>   | C178.2    |
| 3.                | Orthographic Projections                             | <ul style="list-style-type: none"> <li><b>Projection of points:</b> Point on VP, HP, in space.</li> <li><b>Projection of straight lines:</b> Lines inclined or parallel to any one of the planes; lines inclined to both HP and VP with traces.</li> <li><b>Projection of planes:</b> Plane on VP, HP, inclined to any one of the planes; plane inclined to both HP and VP.</li> </ul> | C178.3    |
| 4.                | Projections of Regular Solids                        | <ul style="list-style-type: none"> <li>Projections of solids in simple position inclined to one/both the planes.</li> </ul>  | C178.3    |
| 5.                | Sections and Sectional Views of Right Angular Solids | <ul style="list-style-type: none"> <li><b>Sections of solids:</b> Section of standard solids and true shape section of standard machine elements for the section planes perpendicular to one plane and parallel or inclined to other plane.</li> </ul>   | C178.3    |

|                                      |   |   |        |
|--------------------------------------|---|---|--------|
| 6.                                   | Isometric Projections                         | <ul style="list-style-type: none"> <li>Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa.</li> </ul>  | C178.4 |
| 7.                                   | Overview of Computer Graphics                 | <ul style="list-style-type: none"> <li>Demonstrating knowledge of the theory of CAD software; Dialog boxes and windows; Shortcut menus; the Command Line; the Status Bar; Isometric Views of lines, Planes, Simple and compound Solids.</li> </ul>                | C178.5 |
| 8.                                   | Customization & CAD Drawing                   | <ul style="list-style-type: none"> <li>CAD Drawing along with customization tools, Annotations, layering &amp; other functions. Orthographic Projections; Model Viewing; Co-ordinate Systems; Multi-view Projection; Surface Modeling; Solid Modeling.</li> </ul> | C178.5 |
| 9.                                   | Demonstration of a simple team design project | <ul style="list-style-type: none"> <li>Technical 2D/3D orthographic and Isometric projections; Demonstration of a simple team design project.</li> </ul>  | C178.5 |
| <b>Evaluation CriteriaComponents</b> |   | <b>Maximum Marks</b>  |        |
| Mid Viva                             |   | 20  |        |
| End Viva                             |   | 20  |        |
| TA                                   |   | 60  |        |
| <b>Total</b>                         |   | <b>100</b>  |        |

**Project based learning:** Auto-CAD is a computer-aided software used for creating 2D/3D models of different machine & structures along with all their components to visualize and analyze the feasibility of the same well before the actual manufacturing/construction. The laboratory mainly focused on engaging the students by replicating 2D and 3D models of common engineering equipment and instrumentation diagrams that enhances student's perception of their graphic expression skills.

|  |  |
|--|--|
| <b>Recommended Reading material:</b> Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format) |  |
| 1.   | Bhatt N.D., Panchal V.M. & Ingle P.R., Engineering Drawing, Charotar Publishing House, 2014. |
| 2.   | Shah, M.B. & Rana B.C., Engineering Drawing and Computer Graphics, Pearson Education, 2008.  |
| 3.   | George Omura, Mastering AutoCAD 2021 and AutoCAD LT 2021, Sybex, 2020.                       |
| 4.   | Alan J. Kalameja, AutoCAD 2010 Tutor for Engineering Graphics, Autodesk Press, 2009.         |

**Detailed Syllabus**  
**Lecture-wise Breakup**

|                        |  |   |   |
|------------------------|--|---|---|
| <b>Course Code</b>     | 15B11CI111                                   | <b>Semester ODD</b><br>(specify Odd/Even)   | <b>Semester I Session-2021-22</b><br><b>Month from:</b> August-21 to Dec-21 |
| <b>Course Name</b>     | Software Development Fundamentals – I        |   |   |
| <b>Credits</b>         | 4  | <b>Contact Hours</b>  | 3-1-0   |
| <b>Faculty (Names)</b> | <b>Coordinator(s)</b>                        | Dr. Ankita Verma(J62), Mr. Prantik Biswas (J62), Ms. Akanksha Mehndiratta(J128), , Dr. Himani Bansal(J128)  |   |
|                        | <b>Teacher(s)</b><br><b>(Alphabetically)</b> | <b>J62:</b> Dr. Amanpreet Kaur, Dr. Amarjeet, Dr. Ankita Verma, Dr. Archana Purwar, Dr. Arpita Jadhav Bhatt, Dr. Jyoti, Ms. Mradula Sharma, Dr. Niyati Aggarwal, Mr. Prantik Biswas, Ms. Purtee Kohli, Dr. Shardha Porwal, Ms. Somya Jain<br><br><b>J128:</b> Dr. Chetna Gupta, Nitin Shukla, Dr. Himanshu Mittal, Dr. Shilpa Budhkar, Surendra Kumar, Ashish Kumar |   |

| <b>COURSE OUTCOMES</b> |   | <b>COGNITIVE LEVELS</b>  |
|------------------------|---|--------------------------|
| <b>C109.1</b>          | Explain various phases of software development life cycle and   | Understanding level (C2) |
| <b>C109.2</b>          | Explain various data types, memory allocation schemes. precedence of arithmetical and logical operations, and need of array, and structures | Understanding level (C2) |
| <b>C109.3</b>          | Design the flow chart and write the high level code for different problems  | Understanding level (C2) |
| <b>C109.4</b>          | Apply and implement functions with or without pointers for different Problems   | Applying level (C3)      |
| <b>C109.5</b>          | Demonstrate and implement various operations like traverse, insertion, deletion, <i>etc.</i> on files                                       | Applying level (C3)      |

| <b>Module No.</b> | <b>Subtitle of the Module</b>           | <b>Topics in the Module</b>   | <b>No. of Lectures for the module</b> |
|-------------------|---|---|---------------------------------------|
| 1.                | Introduction                            | Introduction to Software Development Life Cycle, Step by step solution to simple problems, developing logic/flow-chart/pseudo code to solve problems like 2D screen saver, simple/logical games, puzzles                            | 9                                     |
| 2.                | Data types, operators, and Control Flow | Data, variables and constants, data types, operators – binary, unary, ternary, operator precedence, operations using different operators, if, if-else, while, do-while, for, switch-case in C Programming                           | 9                                     |
| 3.                | Array                                   | Fundamentals of Array, Implementation of 1D/2D Array and related operations like insertion, traversal, updation, etc. in C programming using different problems   | 6                                     |
| 4.                | Functions                               | Introduction to Functions and its implementation in C programming language, Functions using Pass by value, recursive functions  | 4                                     |
| 5.                | Structures and Union                    | Introduction and implementation of Structures and Union in C programming, Array of Structures and related operations like insertion, traversal, updation, etc. in C programming using different problems, Structures using function | 4                                     |
| 6.                | Pointers                                | Pointers in C, Dynamic memory allocation for 1D/2D array and structures, Arithmetical operations on pointers, functions using pass by reference   | 6                                     |

|   |  |  |           |
|---|--|--|-----------|
| 7.  | File Handling  | Introduction to File, creation of files in C programming language, Modes of File Handling like read, write, update; different types of files like binary file and text file and respective operations like, opening, closing, reading, writing, end of file, traversing the file, for structured and unstructured data | 4         |
| <b>Total number of Lectures</b>   |  |  | <b>42</b> |
| <b>Evaluation Criteria</b>  |  |  |           |
| <b>Components</b>   |  | <b>Maximum Marks</b>   |           |
| T1  |  | 20   |           |
| T2  |  | 20   |           |
| End Semester Examination  |  | 35   |           |
| TA  |  | 25 (Attendance = 10, Class Test, Quizzes, etc = 05, Internal assessment = 05, Assignments in PBL mode = 05)  |           |
| <b>Total</b>  |  | <b>100</b>   |           |
| <b>Recommended Reading material:</b> Author(s), Title, Edition, Publisher, Year of Publication etc. ( Text books, Reference Books, Journals, Reports, Websites etc) |  |  |           |
| <b>Text Books</b>   |  |  |           |
| 1   | Ashok N. Kamthane , “Programming with ANSI and Turbo C”, Pearson Education, Delhi, 2003  |  |           |
| 2   | Griffiths, David, and Dawn Griffiths, “Head First C: A Brain-Friendly Guide”, O’Reilly Media, Inc., 2012.                                |  |           |
| 3   | H. Cooper and H. Mullish, Jaico Publishing House. “Spirit of C”, 4th Edition, Jaico Publishing House, 2006                               |  |           |
| 4   | Greg Perry, Dean Miller, “C Programming Absolute Beginner’s Guide Paperback”, QUE; 3 edition, 2013                                       |  |           |
| <b>Reference Books</b>  |  |  |           |
| 1   | Herbert Schildt. “The Complete Reference C ”, 4th Edition, TMH, 200  |  |           |
| 2   | Brian W. Kernighan and Dennis M. Ritchie ,“The C Programming Language”, 2nd Edition, Prentice-Hall India, New Delhi, 2002                |  |           |
| 3   | B. A. Forouzan, R. F. Gilberg “Computer Science: A Structured Programming Approach Using C”, 2nd Edition, Thomson Press, New Delhi, 2006 |  |           |

## Detailed Syllabus

### Lab-wise Breakup

|                    |   |                      |   |
|--------------------|---|----------------------|---|
| <b>Course Code</b> | <b>15B17CI171</b>                       | <b>Semester ODD</b>  | <b>Semester: 1st Session: 2021 -2022</b><br><b>Month from: Sep –Dec</b> |
| <b>Course Name</b> | Software Development Fundamentals Lab-1 |                      |   |
| <b>Credits</b>     | 1                                       | <b>Contact Hours</b> | 4   |

|                        |                                    |   |
|------------------------|------------------------------------|---|
| <b>Faculty (Names)</b> | <b>Coordinator(s)</b>              | Mradula Sharma & Apeksha Aggarwal (J62),<br>Himanshu Mittal & Swati Gupta (J128)  |
|                        | <b>Teacher(s) (Alphabetically)</b> | J62:<br>Amanpreet Kaur (APR), Amarjeet (AJP), Anita Sahoo (ASA), Ankita Verma (AV), Apeksha (APA), Archana Purwar (ARP), Arpita Jadhav Bhatt (APJ), Naveen Kr Gupta (NKG), Bharat Gupta (BG), Hema N (HN), K.Rajalakshmi (KRL), Kavita Pandey (KP), Megha Rathi (MGR), Mradula Sharma (MSH), Neetu Sardana (NSA), Niyati Aggrawal (NIY), Potukuchi Raghu Vamsi (PRV), Purtee Kohli (PRK), Sakshi Agarwal (SAA), Shulabh (SHB), Suma Dawn (SUD), Vikas Hassija (VH), Nistha (NIS), Pratishtha (PRT), Jaspal Kaur (JP)<br>J128:<br>Akanksha Bhardwaj, Arti Jain, Bansidhar Joshi, Himani Bansal, Mukesh Saraswat, Mukta Goyal, Nitin Shukla, Payal Khurana BAtra, Pulkit Mehndiratta, Raju Pal, Rashmi Kushwa, Shariq Murtuza, Shilpa Budhkar, Swati Gupta, Varsha Garg, Surendra Kumar |

| <b>COURSE OUTCOMES</b> |   | <b>COGNITIVE LEVELS</b> |
|------------------------|---|-------------------------|
| C172.1                 | Develop programs/logic for data types, expressions and conditional structure. | Applying Level (C3)     |
| C172.2                 | Perform programs for array and functions.                                     | Applying Level (C3)     |
| C172.3                 | Implement programs for structure and union.                                   | Applying Level (C3)     |

|        |  |                     |
|--------|--|---------------------|
| C172.4 | Perform programs of pointers and recursive functions.            | Applying Level (C3) |
| C172.5 | Implement menu driven programs to perform basic file operations. | Applying Level (C3) |

| <b>Module No.</b> | <b>Title of the Module</b>                    | <b>Topics in the Module</b>   | <b>No. of Weeks (2 Labs/Week)</b> |
|-------------------|---|---|-----------------------------------|
| 1                 | Logic Building, Puzzles                       | Developing logic/flow-chart/pseudo code to solve problems, simple/logical games, puzzles  | 2 Weeks                           |
| 2                 | Data Type, Statements, Expressions, Operators | Data, variables and constants, data types, operators – binary, unary, ternary, operator precedence, associativity   | 1 Week                            |
| 3                 | Control Flow                                  | Develop C programs using conditional structure (if, if-else, nested if), and iterative control structure (do-while, while, for).<br>Implement switch case statement.  | 2 Weeks                           |
| 4                 | Array and String                              | Array initialization, reading and writing operations with array, one dimensional, two-dimensional array, strings, and related operations like addition, multiplication, traversal, transpose etc.   | 2 Weeks                           |
| 5                 | Functions                                     | User defined functions and inbuilt functions, Functions definition, declaration, calling, Pass by value, functions with array   | 1 Week                            |
| 6                 | Structures and Union                          | Struct keyword, Structure and Union, Structure variable, dot operator, arrow operator, Array of Structures, structure using functions.  | 2 Weeks                           |
| 7                 | Pointers                                      | Pointers in C, Dynamic memory allocation for 1D/2D array and structures, Arithmetical operations on pointers, functions using pass by reference, recursive functions like palindrome, factorial, fibonacci series, number system etc                              | 2 Weeks                           |
| 8                 | File Handling                                 | File creation, Modes of File Handling like read, write, update; different types of files like binary file and text file and respective operations like, opening, closing, reading, writing, end of file, traversing the file for structured and unstructured data | 2 Week                            |

|   |                      |
|---|----------------------|
| <b>Total Number of Labs</b>   | 14 Weeks             |
| <b>Evaluation Criteria</b>  |                      |
| <b>Components</b>   | <b>Maximum Marks</b> |
| Lab Test -1   | 20                   |
| Lab Test -2   | 20                   |
| Day to Day  | 60                   |
| Evaluation 1  | 15                   |
| Evaluation 2  | 15                   |
| Mini Project  | 15                   |
| Attendance  | 15                   |
| <b>Total</b>  | <b>100</b>           |
| <p>Project based learning: Each student in a group of 3-4 will develop a mini project with the help of various concepts of software development fundamental. In a team they will learn how to apply the concepts for problem solving in a meaningful way.</p> |                      |

|  |   |
|--|---|
| <b>Recommended Reading material:</b> Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format) |   |
| <b>1</b>   | H. Cooper and H. Mullish, Jaico Publishing House. “Spirit of C”, 4 <sup>th</sup> Edition, Jaico Publishing House, 2006                                |
| <b>2</b>   | Herbert Schildt. “The Complete Reference C ”, 4 <sup>th</sup> Edition, TMH, 2000  |
| <b>3</b>   | Brian W. Kernighan and Dennis M. Ritchie ,“The C Programming Language”, 2 <sup>nd</sup> Edition, Prentice-Hall India, New Delhi, 2002                 |
| <b>4</b>   | Peter Norton, “Introduction to Computers”, 5 <sup>th</sup> edition, Tata McGraw-Hill, Delhi., 2005.   |
| <b>5</b>   | Balaguruswamy, Programming in ANCI C”, 2 <sup>nd</sup> Edition, TMH, 2001.  |
| <b>6</b>   | Ashok N. Kamthane , “Programming with ANSI and Turbo C”, Pearson Education, Delhi, 2003   |
| <b>7</b>   | Rajaraman V., “Fundamentals of Computer”, 3 <sup>rd</sup> Edition, Prentice-Hall India, New Delhi, 2005.  |
| <b>8</b>   | B. A. Forouzan, R. F. Gilberg “Computer Science: A Structured Programming Approach Using C”, 2 <sup>nd</sup> Edition, Thomson Press, New Delhi, 2006. |

**Detailed Syllabus**  
**Lecture-wise Breakup**

|                    |            |                      |   |
|--------------------|------------|----------------------|---|
| <b>Course Code</b> | 15B11PH111 | <b>Semester: ODD</b> | <b>Semester: 1<sup>st</sup>, Session: 2021 -2022</b><br><b>Month from: July 21 to December 21</b> |
| <b>Course Name</b> | PHYSICS-1  |                      |   |
| <b>Credits</b>     | 4          | <b>Contact Hours</b> | 4   |

|                        |                                    |   |
|------------------------|------------------------------------|---|
| <b>Faculty (Names)</b> | <b>Coordinator(s)</b>              | Dr Amit Verma and Dr Dinesh Tripathi  |
|                        | <b>Teacher(s) (Alphabetically)</b> | Alok Pratap Singh Chauhan, Anirban Pathak, Anuj Kumar, Anuraj Panwar, Anshu D. Varshney, Ashish Bhatnagar, D.K.Rai, Manoj Tripathi, Navendu Goswami, Navneet K Sharma, Prashant Chauhan, Papia Chowdhury, R.K. Dwivedi, S. C. Katyayal, S.P.Purohit, Suneet K Awasthi, Vikas Malik. |

| <b>COURSE OUTCOMES</b> |  | <b>COGNITIVE LEVELS</b> |
|------------------------|--|-------------------------|
| <b>C101.1</b>          | Recall the basic principles of physics related to optics, relativity, quantum mechanics, atomic physics.                               | Remembering (C1)        |
| <b>C101.2</b>          | Illustrate the various physical phenomena with interpretation based on the mathematical expressions involved.                          | Understanding (C2)      |
| <b>C101.3</b>          | Apply the concepts/principles to solve the problems related to wave nature of light, relativity, quantum mechanics and atomic physics. | Applying (C3)           |
| <b>C101.4</b>          | Analyze and examine the solution of the problems using physical and mathematical concepts involved.                                    | Analyzing (C4)          |

| <b>Module No.</b>               | <b>Title of the Module</b> | <b>Topics in the Module</b>   | <b>No. of Lectures for the module</b> |
|---------------------------------|----------------------------|---|---------------------------------------|
| 1.                              | Physical Optics            | Analytical treatment of interference, Intensity distribution of fringe system, Fresnel's Bi-prism, Newton's rings, Michelson interferometer, Diffraction (limited to Fraunhofer class) from Single slit, double slit and Diffraction grating, Polarization, Phenomenological understanding of Birefringence, Principles of use of uni-axial crystals in practical polarizers, compensators and wave plates, Production and analysis of completely polarized light. Retardation Plate, Optical activity, Polarimeter. Resolving Power of Microscope. | 17                                    |
| 2.                              | Relativity                 | Frame of references, Galilean Transformations, Michelson-Morley experiment, Lorentz transformations, Addition of velocities, Mass variation with velocity, Mass-energy relation.  | 5                                     |
| 3.                              | Atomic Structure           | Origin of spectral lines, spin and orbital angular momentum, Quantum numbers, Designation of States, Atoms in magnetic field, Zeeman effect.  | 4                                     |
| 4.                              | Radiation                  | Black body radiation, Wein's law, Rayleigh Jeans law, Implications of Bose-Einstein statistics, Planck's law of radiation, Wein's Displacement Law.   | 4                                     |
| 5.                              | Quantum Mechanics          | Wave-particle duality, Compton scattering, Matter waves, Heisenberg's uncertainty principle, Schrödinger wave equation and its applications to the free particle in a box (1D+3D), potential barrier and tunnel diode as its application  | 10                                    |
| <b>Total number of Lectures</b> |                            |   | <b>40</b>                             |



| <b>Evaluation Criteria</b> |  |
|----------------------------|--|
| <b>Components</b>          | <b>Maximum Marks</b>   |
| T1                         | 20   |
| T2                         | 20   |
| End Semester Examination   | 35   |
| TA                         | 25 [Attendance (07M), Class Test, Quizzes, etc (07 M), Assignments in PBL mode (06 M), and Internal assessment (05 M)] |
| <b>Total</b>               | <b>100</b>   |

| <b>Recommended Reading material:</b> Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format) |   |
|--|---|
| 1.   | A. K. Ghatak, <i>Optics</i> , Tata McGraw Hill.                                       |
| 2.   | E. Hecht, <i>Optics</i> , Pearson Education.  |
| 3.   | F. A. Jenkins and H. E. White, <i>Fundamentals of optics</i> , Tata McGraw Hill.      |
| 4.   | R. S. Sirohi, <i>Wave Optics</i> , Orient and Longman.                                |
| 5.   | Reshnick, <i>Relativity</i> , New Age.  |
| 6.   | A. Beiser, <i>Concepts of Modern Physics</i> , Mc Graw Hill International.            |
| 7.   | Introduction to Quantum Mechanics by David J. Griffiths, Second Edition, Pearson.     |
| 8.   | Quantum Mechanics by Ghatak and Lokanathan, 5 <sup>th</sup> Edition, Macmillan India. |

**Project Based Learning (PBL):** The students will be given small projects (in groups) on various topics like Interference, diffraction, polarization, relativity, radiations, Quantum mechanics, to explore their applications in engineering, and technology to understand the role of physics. This will help the students to connect the concept studied in the class with their application in engineering and technology and will enhance their analytical skills.

**Detailed Syllabus**  
**Lab-wise Breakup**

|                    |               |                      |  |
|--------------------|---------------|----------------------|--|
| <b>Course Code</b> | 15B17PH171    | <b>Semester: ODD</b> | <b>Semester: 1<sup>st</sup> Session: 2020 -2021</b><br><b>Month from June 21 to July 21</b><br><b>(deferred)</b> |
| <b>Course Name</b> | Physics Lab-1 |                      |  |
| <b>Credits</b>     | 01            | <b>Contact Hours</b> | 02   |

|                        |  |  |
|------------------------|--|--|
| <b>Faculty (Names)</b> | <b>Coordinator(s)</b>                        | Anuraj Panwar and S K Awasthi  |
|                        | <b>Teacher(s)</b><br><b>(Alphabetically)</b> | Alok Pratap Singh Chauhan, Amit Verma, Anuj Kumar, Ashish Bhatnagar, Manoj Tripathi, N. K. Sharma, Papia Chowdhury, Prashant Chauhan, R. K. Dwivedi, S. P. Purohit, Sandeep Chhoker, Vikas Malik |

| <b>COURSE OUTCOMES</b> |  | <b>COGNITIVE LEVELS</b> |
|------------------------|--|-------------------------|
| <b>C170.1</b>          | Recall optics and modern physics principles behind the experiments.                          | Remembering (C1)        |
| <b>C170.2</b>          | Explain the experimental setup and the principles involved behind the experiments performed. | Understanding (C2)      |
| <b>C170.3</b>          | Plan the experiment and set the apparatus and take measurements.                             | Applying (C3)           |
| <b>C170.4</b>          | Analyze the data obtained and calculate the error.   | Analyzing (C4)          |
| <b>C170.5</b>          | Interpret and justify the results.   | Evaluating (C5)         |

| <b>Module No.</b> | <b>Title of the Module</b> | <b>List of Experiments</b>   | <b>CO</b> |
|-------------------|----------------------------|--|-----------|
| 1.                | Optics                     | <ol style="list-style-type: none"> <li>1. To determine the wavelength of sodium light with the help of Newton's rings setup</li> <li>2. To determine the wavelength of sodium light with the help of Fresnel's Bi-prism</li> <li>3. To find the specific rotation of cane- sugar solution by a polarimeter at room temperature, using half-shade / Bi-quartz device.</li> <li>4. To determine the dispersive power of the material of a prism with the help of a spectrometer.</li> <li>5. To determine the wavelength of prominent spectral lines of mercury light by a plane transmission grating using normal incidence method</li> </ol> | 1-5       |
| 2.                | Modern Physics             | <ol style="list-style-type: none"> <li>6. To study the Photoelectric effect and determine the value of Planck's constant.</li> <li>7. Determination of Planck's constant by measuring radiation in a fixed spectral range.</li> </ol>  | 1-5       |
| 3.                | Electricity and Magnetism  | <ol style="list-style-type: none"> <li>8. To verify Stefan's law by electrical method.</li> <li>9. To determine the resistance per unit length of Carey Foster's bridge wire and specific resistance of the material of the given wire using Carey Foster's bridge.</li> <li>10. To study the variation of magnetic field with distance, along the axis of Helmholtz galvanometer, and to estimate the radius of the coil.</li> </ol>  | 1-5       |

**Evaluation Criteria**

| <b>Components</b>  | <b>Maximum Marks</b> |
|--------------------|----------------------|
| Mid Term Viva (V1) | 20                   |
| End Term Viva (V2) | 20                   |
| D2D                | 60                   |
| <b>Total</b>       | <b>100</b>           |

**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. | Dey and Dutta, <i>Practical Physics</i> , Kalyani Publication. |
| 2. | Experiment hand-outs.  |

### Course Description

|  |  |   |   |
|--|--|---|---|
| <b>Course Code</b>   | 15B11MA111   | <b>Semester</b> Odd   | <b>Semester I Session</b> 2021-22<br><b>Month from</b> Aug 2021- Jan 2022 |
| <b>Course Name</b>   | Mathematics-1  |   |   |
| <b>Credits</b>   | 4  | <b>Contact Hours</b>  | 3-1-0   |
| <b>Faculty (Names)</b>   | <b>Coordinator(s)</b>  | Dr. Dinesh C. S. Bisht, Dr. Vipin Chandra Dubey   |   |
|  | <b>Teacher(s) (Alphabetically)</b>   | Dr.Amita Bhagat, Dr. Anuj Bhardwaj, Dr. Dinesh C. S. Bisht, , Dr. Mohd. Sarfaraz, Dr. Neha Singhal, Dr. Nisha Shukla, Dr. Pankaj Kumar Srivastava, Dr. Richa Sharma, Dr. Shikha Pandey, Dr. Vipin Chandra Dubey |   |
| <b>COURSE OUTCOMES</b>   |  |   | <b>COGNITIVE LEVELS</b>   |
| After pursuing the above mentioned course, the students will be able to: |  |   |   |
| <b>C105.1</b>  | Explain the concepts of limits, continuity and differentiability of functions of several variables.  |   | Understanding Level (C2)  |
| <b>C105.2</b>  | Explain the Taylor's series expansion of functions of several variables and apply it in finding maxima and minima of functions.            |   | Applying Level (C3)   |
| <b>C105.3</b>  | Make use of double and triple integrals to find area and volume of curves and surfaces.  |   | Applying Level (C3)   |
| <b>C105.4</b>  | Explain the concepts of vector calculus and apply Green's, Stoke's and Gauss divergence theorems in engineering problems.                  |   | Applying Level (C3)   |
| <b>C105.5</b>  | Solve the ordinary differential equations and explain the concepts of Laplace transform for solving engineering problems.                  |   | Applying Level (C3)   |
| <b>C105.6</b>  | Utilize matrix algebra for solving a system of linear equations and explain eigenvalues, eigenvectors, diagonalization and quadratic form. |   | Applying Level (C3)   |

| <b>Module No.</b> | <b>Title of the Module</b> | <b>Topics in the Module</b>  | <b>No. of Lectures for the module</b> |
|-------------------|----------------------------|--|---------------------------------------|
| 1.                | Partial differentiation    | Chain rule, change of variables, Taylor's series for function of two or more variables, maxima and minima of function of two variables, Jacobians. | 7                                     |

|  |  |   |           |
|--|--|---|-----------|
| 2.   | Double integrals   | Change of order and change of variables, Gamma and Beta functions, Applications to areas and volumes, Equations to curves and surfaces, Plots of some well known curves and surfaces.   | 7         |
| 3.   | Vector Differentiation   | Gradient, divergence and curl, Normal and tangent to a plane surface.   | 3         |
| 4.   | Vector Integration   | Line integrals, Green's Theorem in a plane, surface integrals, Gauss and Stokes theorems.   | 7         |
| 5.   | Differential Equations   | Differential Equations with constant coefficients, Cauchy-Euler equations, Equations of the form $y''=f(y)$ , simple applications.  | 6         |
| 6.   | Laplace Transform  | Laplace Transform, inverse Laplace transform, Dirac delta and unit step function, Solution of IVPs.   | 6         |
| 7.   | Matrices   | Linear dependence and independence of rows, row echelon form, Rank, Gauss elimination method, Eigen values and vectors, symmetric matrices, Reduction to diagonal form Quadratic forms. | 6         |
| <b>Total number of lectures</b>  |  |   | <b>42</b> |
| <p><b>Evaluation Criteria</b></p> <p><b>Components Maximum Marks</b></p> <p>T1 20</p> <p>T2 20</p> <p>End Semester Examination 35</p> <p>TA 25 (Quiz, Assignments, Tutorials, PBL)</p> <p><b>Total 100</b></p> |  |   |           |
| <p><b>Project based learning: Each student in a group of 4-5 will apply the concepts of Differential Equations and Laplace Transform to solve practical problems.</b></p>                                      |  |   |           |
| <p><b>Recommended Reading material:</b> Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)</p>                  |  |   |           |
| 1.   | <b>Jain, R. K. &amp;Iyenger, S. R. K.</b> , Advanced Engineering Mathematics, 4 <sup>th</sup> Ed., Alpha Science International, 2013.        |   |           |
| 2.   | <b>Prasad, C.</b> , (a) Mathematics for Engineers (b) Advanced Mathematics for Engineers, Prasad Mudranalaya, 1982.                          |   |           |
| 3.   | <b>Lipschutz, S., Lipsom, M.</b> , Linear Algebra, 3 <sup>rd</sup> Ed, Schaum Outline Series, 2001.  |   |           |
| 4.   | <b>Thomas, G. B and Finney, R. L.</b> , Calculus and Analytical Geometry, 9th Ed., Pearson Education Asia (Adisson Wesley), New Delhi, 2000. |   |           |

**Detailed Syllabus**  
**Lecture-wise Breakup**

|                        |  |   |   |
|------------------------|--|---|---|
| <b>Course Code</b>     | 15B11HS112                                   | <b>Semester: Odd</b>  | <b>Semester: I Session 2021-22</b><br><b>Month: July-December</b> |
| <b>Course Name</b>     | English                                      |   |   |
| <b>Credits</b>         | 3  | <b>Contact Hours</b>  | 2-0-2   |
| <b>Faculty (Names)</b> | <b>Coordinator(s)</b>                        | Dr Monali Bhattacharya & Dr Ekta Srivastava   |   |
|                        | <b>Teacher(s)</b><br><b>(Alphabetically)</b> | Dr Ankita Das, Dr Anshu Banwari, Dr Ekta Srivastava, Dr Monali Bhattacharya, Dr Nilu Chaudhary, Ms Puneet Pannu , |   |

| <b>COURSE OUTCOMES</b> |   | <b>COGNITIVE LEVELS</b> |
|------------------------|---|-------------------------|
| <b>C114.1</b>          | Develop an understanding and appreciate the basic aspects of English as a communication tool.         | Understand (C2)         |
| <b>C114.2</b>          | Apply grammar concepts and vocabulary skills in presentation and in spoken and written communication. | Apply (C3)              |
| <b>C114.3</b>          | Demonstrate an understanding of different forms of literature and rhetorical devices                  | Understand (C2)         |
| <b>C114.4</b>          | Examine literature as reflection of individual and society  | Analyse (C4)            |
| <b>C114.5</b>          | Compose different forms of professional writing   | Create (C6)             |
| <b>C114.6</b>          | Apply Phonetics through theory and practice for better pronunciation                                  | Apply (C3)              |

| <b>Module No.</b> | <b>Title of the Module</b>      | <b>Topics in the Module</b>  | <b>No. of Lectures for the module</b> |
|-------------------|---------------------------------|--|---------------------------------------|
| <b>1.</b>         | English as a Communication Tool | Basic aspects of English: LSRW: Listening, Speaking, Reading, Writing<br>Non-Verbal Communication: Body Language, Voice Modulation, Posture;<br>Presentation Techniques: Self-Presentation Strategies; Types of Strategic Presentation; PPT Presentations;<br>Using Gambits to refine Group Discussions and Interview Skills<br>Phonetics: Pronunciation, Stress, Rhythm, Intonation   | 9                                     |
| <b>2.</b>         | Grammar & Vocabulary            | <i>Parts of Speech and Agreement of Noun-Verb; Noun-Pronoun;</i><br><i>Tense, Aspect, Mood and Voice</i><br><i>Vocabulary Enrichment techniques: The concept of Word Formation; Root words from foreign languages and their use in English; Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives; Synonyms, Antonyms, Homonyms, Homophones, Collocation.</i><br><i>Error Analysis</i> | 6                                     |

|                                 |                                  |   |           |
|---------------------------------|----------------------------------|---|-----------|
| 3                               | Language through Literature      | <b>Forms of Literature &amp; Rhetorical Devices</b><br><b>Short Story</b><br>· Too Bad by Isaac Asimov<br><b>Poem</b><br>· Where the mind is without fear by Rabindra Nath Tagore<br><b>One act Play</b><br>Refund by Fritz Karinthy<br><b>Famous Speech</b><br>Swami Vivekanand's Chicago Speech | 5         |
| 3.                              | Professional Application/Writing | Textual Organization<br>· Letter Writing, Email Etiquettes, Feedbacks and Review Writing<br>· Notice, Agenda and Minutes<br>· Format of Report Writing<br>· CV and Resume   | 8         |
| <b>Total number of Lectures</b> |                                  |   | <b>28</b> |

### Practical Modules

|   |                               |
|---|-------------------------------|
| <b>Syllabus for Reading Modules</b>   | <b>No. of Hours in Lab: 7</b> |
| <b>Practical for Learning Comprehension Strategies of Reading through Activities:</b> <ul style="list-style-type: none"> <li>• Summarizing</li> <li>• Sequencing</li> <li>• Inferencing</li> <li>• Comparing and contrasting; Drawing conclusions</li> <li>• Self-questioning</li> <li>• Problem-solving;</li> <li>• Newspaper reading and comprehension</li> <li>• Relating background knowledge</li> <li>• Distinguishing between fact and opinion</li> <li>• Finding the main idea, important facts, and supporting details</li> </ul>   | 5 Hrs                         |
| <b>Practice Quick Reading through SKY Read up-Speed Up Software or SAT/CAT/IELTS exercises.</b>   | 2 Hrs                         |
| <b>Syllabus for Listening Modules</b>   | <b>No. of Hours in Lab: 7</b> |
| <b>Practical for Mastering the Skill of Listening through Activities:</b> <ul style="list-style-type: none"> <li>• <b>Listening for the Main Idea; Listening for Detail: 5 Ws and H questions; Listening in sequence: for order following Through Ted Talks</b></li> <li>• <b>Listening with vocabulary through Bingo</b></li> <li>• <b>Listening for understanding personal &amp; social connotations through News Brief, Interviews.</b></li> <li>• <b>Listening for non-verbal connotations through Audio-Videos and Movie Clips</b></li> <li>• <b>Listening for Functional Language: understanding choice of words for same situation.</b></li> </ul> | 5 Hrs                         |

|  |       |
|--|-------|
| Practice Listening through software of Sky IELTS Listening Exercises or Podcasts | 2 Hrs |
|--|-------|

| Syllabus for Speaking Modules   | No. of Hours in Lab: 7 |
|---|------------------------|
| Activities based on Usage of Grammar Concepts in Communication: <ul style="list-style-type: none"> <li>Spoken vs. Written language- Formal and Informal English (Bingo);</li> <li>Practice through JAM Session- Situational Dialogues – Greetings – Taking; Leave – Introducing Oneself and Others. Making Requests and Seeking Permissions - Telephone Etiquette.</li> </ul>                             | 2 Hrs                  |
| Activities for Vocabulary Enrichment: <ul style="list-style-type: none"> <li>Cue Cards based Activities: Practice: Learning new words and and usage through various connotations and denotations;</li> <li>Practice through News Briefs &amp; Peer Learning</li> </ul>  | 2 Hrs                  |
| Activities for learning Public Speaking: <ul style="list-style-type: none"> <li>Exposure to Structured Talks - Non-verbal Communication: Practice: Situational Dialogues –Navigating Memory Lanes and Re-creating through Role-Play- Expressions in Various Situations;</li> <li>Practice of Phonetics, Stress and Intonation while Making a Short Speech, Extempore and Making a Presentation</li> </ul> | 3 Hrs                  |

| Syllabus for Writing Modules   | No. of Hours in Lab: 7 |
|--|------------------------|
| <b>Grammar Practice &amp; Exercises:</b> <ul style="list-style-type: none"> <li>Jumbled Paragraphs for grammar learning</li> <li>Picking the Out of Context sentence in a Jumbled Paragraph for proper communication.</li> <li>Application of right grammar concepts</li> </ul>  | 2 Hrs                  |
| <b>Practical on Different forms of writing, like persuasive writing, expository, narrative, descriptive</b>  | 1 Hr                   |
| <b>Cohesion in Writing: Application of Discourse Markers:</b> <ul style="list-style-type: none"> <li>Enriched vocabulary patterns in sentence structuring</li> <li>Fill in the missing vocabulary items in sentences</li> <li>Fill in the missing structural items in sentences</li> <li>Finish the text (Cloze Writing)</li> <li>Bring cohesion in writing with proper tense usage</li> </ul> | 2 Hrs                  |
| <b>Picture composition &amp; Precis Writing:</b> <ul style="list-style-type: none"> <li>Using Action Words</li> <li>Activity writing</li> <li>Information Transfer</li> <li>Experience Sharing</li> </ul>  | 2 Hrs                  |



| <b>Evaluation Criteria</b>   |  |
|--|--|
| <b>Components</b>  | <b>Maximum Marks</b>   |
| T1   | 20   |
| T2: LAB Exam   | 20   |
| End Semester Examination   | 35   |
| TA   | 25 (Project, Lab Test, Lab File Assessment)  |
| <b>Total</b>   | <b>100</b>   |
| <p><b>PBL Component:</b> The creative writing project is to be done in a group of 3-4 students. Students will be asked to choose one specific word that impacts all six dimensions of their life-mental, physical, emotional, relational, spiritual and financial. The simplicity of choosing one word makes it a catalyst for life change. The word chosen should serve as the underlying theme for the creative activity. (Examples of some words could be Power, Passion, Gratitude, Compassion, Integrity, Humility to name a few). Students will Craft/Create/Compose either a poem, prose piece (short story) or one act play on the above highlighting the choice of the word, justifying their choice and the use of literary devices to make their piece of art appealing and effective. The creative write-up should be attempted in 1-2 pages, using Times New Roman 12 font with single spacing. The students will also attach a page to enumerate the following:</p> <ol style="list-style-type: none"> <li>1. Identify the devices used.</li> <li>2. Highlight the contribution of each group member against his/her name in complete work.</li> </ol> |  |
| <p><b>Recommended Reading material:</b> Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)</p>  |  |
| 1.   | <b>C.L.Bovee, J.V.Thill, M.Chaturvedi</b> , <i>Business Communication Today</i> , 9 <sup>th</sup> Ed, Pearson Education, copyright@ Dorling Kinderslay (India) Pvt Ltd, 2009                                 |
| 2.   | <b>Kelly M. Quintanilla and S.T.Wahl</b> , <i>Business and Professional Communication</i> , Sage Publications Pvt India Ltd, 2011  |
| 3.   | <b>S. Kumar and Pushp Lata</b> , <i>Communication Skills</i> , Oxford University Press, 1 <sup>st</sup> , Ed. 2011   |
| 4.   | <b>R.K Bansal, and J.B Harrison</b> , <i>Spoken English for India</i> , Orient Longman, 2018   |
| 5  | <b>M A Yadugiri</b> , <i>The Pronunciation of English: Principles and Practice</i> , Viva Books Pvt. Ltd, India, 2015  |
| 6  | <b>Rabindranath Tagore</b> , <i>“Where the Mind is without Fear”</i> , BK Classics   |
| 7  | <b>A. R. Rizvi</b> , ‘Effective Technical Communication’ 2nd edition, McGraw Hill Education Private Limited, Chennai, 2018.  |
| 8  | <b>Raymond Murphy</b> , <i>English Grammar in Use</i> , 5 <sup>th</sup> edition, Cambridge University Press, 2019.   |
| 9  | <b>Hewings, M.</b> <i>English Pronunciation in Use. Advanced.</i> Cambridge: CUP, 2009   |
| 10   | <b>Krishna Mohan and N. P. Singh</b> , <i>Speaking English Effectively</i> 2nd Edition. Macmillan Publishers India Ltd. Delhi. 2011  |
| 11   | <b>Isaac Asimov</b> , <i>“Too Bad”</i> , Robot Visions, ROC Books, New York, NY, USA, 1991   |
| 12   | <b>Suresh Kumar, E. &amp; Sreehari, P.</b> <i>A Handbook for English Language Laboratories.</i> New Delhi: Foundation, 2009.   |
| 13   | <b>Fritz Karinthy</b> , <i>“The Refund”</i> , A Play in One Act adapted by Percival Wilde, French’s Acting Edition, London, 1958   |
| 14   | <b>Swami Vivekananda &amp; Sankar Srinivasan</b> , <i>“Sisters &amp; Brothers of America: Speech at World Parliament of Religions, Chicago, 1893”</i> , Creative Space Independent Publishing Platform, 2015 |