

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

|                    |                                       |                      |   |
|--------------------|---------------------------------------|----------------------|---|
| <b>Course Code</b> | 15B11CI111                            | <b>Semester:</b> ODD | <b>Semester:</b> I <b>Session:</b> 2022-23<br><b>Month from</b> Sept-22 to Jan-23 |
| <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>                  | Mr. Prantik Biswas (J62), Dr. Himanshu Mittal (J128)   |
|                        | <b>Teacher(s)<br/>(Alphabetically)</b> | <b>J62:</b> Dr. Alka Singhal, Dr. K Vimal Kumar, Dr. Kapil Madan, Dr. Manish Thakur, Dr. Mradula Sharma, Dr. Naveen Kumar Gupta, Mr. Prantik Biswas<br><br><b>J128:</b> Dr. Chetna Gupta, Dr. Nitin Shukla, Dr. Pulkit Mehndiratta, Dr. Shruti Jaiswal, Dr. Vartika Puri |

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

| <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>   |           |
| <p><b>Project Based learning:</b> In this subject, students work in the team of 3-4 people, to implement a small application/mini-project based on the learned concepts. The students will be able apply various concepts of SDLC lifecycle, C pointers, functions, arrays, structures, union and file handling for developing a real life application. This will aid in their employability in software industry.</p> |  |  |           |
| <p><b>Recommended Reading material:</b> Author(s), Title, Edition, Publisher, Year of Publication etc. ( Text books, Reference Books, Journals, Reports, Websites etc)</p>   |  |  |           |
| <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: I Session: 2022-23</b><br><b>Month from Sept-22 to Jan-23</b> |
| <b>Course Name</b> | Software Development Fundamentals Lab-1 |                      |  |
| <b>Credits</b>     | 1                                       | <b>Contact Hours</b> | 0-0-4  |

|                        |                                    |  |
|------------------------|------------------------------------|--|
| <b>Faculty (Names)</b> | <b>Coordinator(s)</b>              | Ms. Kirti Aggarwal (J62), Dr. Shruti Jaiswal (J128)  |
|                        | <b>Teacher(s) (Alphabetically)</b> | Adwitiya Sinha, Amanpreet Kaur, Ambalika Sarkar, Amit Mishra, Anita Sahoo, Anuja Arora, Arti Jain, Ashish Sharma, Bansidhar Joshi, Himashu Aggarwal, Himanshu Mittal, K Vimal Kumar, K Rajalakshmi, Kavita Pandey, Kirti Aggarwal, Kritika Rani, Manish Kumar Thakur, Naveen Kumar, Naveen K. Gupta, Nishtha, Nitin Shukla, Parul Agarwal, Potukuchi Raghu Vamsi, Prantik Biswas, Pulkit Mehndiratta, Sandeep Kumar Singh, Sangeeta Mittal, Satish Chandra, Shruti Jaiswal, Somya Jain, Vartika Puri |

| <b>COURSE OUTCOMES</b> |   | <b>COGNITIVE LEVELS</b> |
|------------------------|---|-------------------------|
| C172.1                 | Develop programs/logic for data types, expressions and conditional structure. | Apply (level 3)         |
| C172.2                 | Perform programs for array and functions.                                     | Apply (level 3)         |
| C172.3                 | Implement programs for structure and union.                                   | Apply (level 3)         |
| C172.4                 | Perform programs of pointers and recursive functions.                         | Apply (level 3)         |
| C172.5                 | Implement menu driven programs to perform basic file operations.              | Apply (level 3)         |

| <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                 | Flow chart and Logic Building                 | 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 Weeks |

|                              |          |
|------------------------------|----------|
| <b>Total Number of Weeks</b> | 14 Weeks |
|------------------------------|----------|

#### Evaluation Criteria

| Components   | Maximum Marks |
|--------------|---------------|
| Lab Test -1  | 20            |
| Lab Test -2  | 20            |
| Day to Day   | 60            |
| Evaluation 1 | 15            |
| Evaluation 2 | 15            |
| Project      | 15            |
| Attendance   | 15            |
| <b>Total</b> | <b>100</b>    |

**Project Based learning:** In this subject, students work in the team of 3-4 people, to implement a small application/mini-project based on the learned concepts. The students will be able apply various concepts of SDLC lifecycle, C pointers, functions, arrays, structures, union and file handling for developing a real life application. This will aid in their employability in software industry.

**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 | 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. |
| <b>9</b> | Avi Silberschatz, Henry F. Korth, and S. Sudarshan, "Database System Concepts", 6 <sup>th</sup> edition, McGraw-Hill, 2010.                           |

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

|                        |  |   |  |
|------------------------|--|---|--|
| <b>Course Code</b>     | 15B11HS112                             | <b>Semester: Odd</b>  | <b>Semester: I Session: 2022-23</b><br><b>Month from Sept-22 to Jan-23</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>                  |   |  |
|                        | <b>Teacher(s)<br/>(Alphabetically)</b> | Dr Ankita Das, Dr Anshu Banwari, Dr. Ekta Singh, Dr Ekta Srivastava, Dr. Debjani Sarkar, Dr Monali Bhattacharya, Dr Nilu Choudhary. |  |

| <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;<br/>Tense, Aspect, Mood and Voice<br/>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.<br/>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> |

| <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>● Listening for the Main Idea; Listening for Detail: 5 Ws and H questions; Listening in sequence: for order following Through Ted Talks</li> <li>● Listening with vocabulary through Bingo</li> <li>● Listening for understanding personal &amp; social connotations through News Brief, Interviews.</li> <li>● Listening for non-verbal connotations through Audio-Videos and Movie Clips</li> <li>● Listening for Functional Language: understanding choice of words for same situation.</li> </ul> | 5 Hrs                         |

|   |       |
|---|-------|
| <b>Practice Listening through software of Sky IELTS Listening Exercises or Podcasts</b> | 2 Hrs |
|---|-------|

| <b>Syllabus for Speaking Modules</b>   | <b>No. of Hours in Lab: 7</b> |
|--|-------------------------------|
| <b>Activities based on Usage of Grammar Concepts in Communication:</b> <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                         |
| <b>Activities for Vocabulary Enrichment:</b> <ul style="list-style-type: none"> <li>Cue Cards based Activities: Practice: Learning new words and usage through various connotations and denotations;</li> <li>Practice through News Briefs &amp; Peer Learning</li> </ul>  | 2 Hrs                         |
| <b>Activities for learning Public Speaking:</b> <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                         |

| <b>Syllabus for Writing Modules</b>  | <b>No. of Hours in Lab: 7</b> |
|--|-------------------------------|
| <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>                                  |

**PBL Component:** The students will be assigned a group project on Creative Writing in the form of a poem, prose piece (short story) or one act play accompanied with a detailed report on rhetorical devices and the contribution of each group member.

| <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.   | <b>C.L.Bovee, J.V.Thill, M.Chaturvedi</b> , <i>Business Communication Today</i> , 9 <sup>th</sup> Ed, Pearson Education, Pvt Ltd, 2021   |
| 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> , “Where the Mind is without Fear” <a href="https://allpoetry.com/where-the-mind-is-without-fear">https://allpoetry.com/where-the-mind-is-without-fear</a>            |
| 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</i> . Advanced. 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> , “Too Bad”, 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> , “The Refund”, <a href="https://egyankosh.ac.in/bitstream/123456789/27478/1/Unit-4.pdf">https://egyankosh.ac.in/bitstream/123456789/27478/1/Unit-4.pdf</a>                |
| 14   | <b>Swami Vivekananda &amp; Sankar Srinivasan</b> , “Sisters & Brothers of America: Speech at World Parliament of Religions, Chicago, 1893”, Creative Space Independent Publishing Platform, 2015 |

**Detailed Syllabus  
Lecture-wise Breakup**

|  |  |   |   |
|--|--|---|---|
| <b>Course Code</b>   | 15B11MA111   | <b>Semester</b> Odd   | <b>Semester: I    Session: 2022-23<br/>Month from Sept-22 to Jan-23</b> |
| <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. Himanshu Agarwal, Dr. Pinkey Chauhan, Dr. Manish Bansal, Dr. Mohd. Sarfaraz   |   |
|  | <b>Teacher(s) (Alphabetically)</b>   | Prof. Alka Tripathi, Prof. A.K. Agarwal, Dr. Amita Bhagat, Dr. Anuj Bhardwaj, Dr. Dinesh C. S. Bisht, Dr. Himanshu Agarwal, Prof. Lokendra Kumar, Dr. Manish Bansal, Dr. Mohd. Sarfaraz, Dr. Neha Ahlawat, Dr. Neha Singhal, Dr. Nisha Shukla, Dr. Pankaj Kumar Srivastava, Dr. Pinkey Chauhan, Prof. R. C. Mittal, Dr. Shruti Goel, 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> <table> <thead> <tr> <th>Components</th> <th>Maximum Marks</th> </tr> </thead> <tbody> <tr> <td>T1</td> <td>20</td> </tr> <tr> <td>T2</td> <td>20</td> </tr> <tr> <td>End Semester Examination</td> <td>35</td> </tr> <tr> <td>TA</td> <td>25 (Quiz, Assignments, Tutorials, PBL)</td> </tr> <tr> <td><b>Total</b></td> <td><b>100</b></td> </tr> </tbody> </table> |  |   |                                       | Components | Maximum Marks | T1 | 20 | T2 | 20 | End Semester Examination | 35 | TA | 25 (Quiz, Assignments, Tutorials, PBL) | <b>Total</b> | <b>100</b> |
| Components  | Maximum Marks  |   |                                       |            |               |    |    |    |    |                          |    |    |  |              |            |
| T1  | 20   |   |                                       |            |               |    |    |    |    |                          |    |    |  |              |            |
| T2  | 20   |   |                                       |            |               |    |    |    |    |                          |    |    |  |              |            |
| End Semester Examination  | 35   |   |                                       |            |               |    |    |    |    |                          |    |    |  |              |            |
| TA  | 25 (Quiz, Assignments, Tutorials, PBL)   |   |                                       |            |               |    |    |    |    |                          |    |    |  |              |            |
| <b>Total</b>  | <b>100</b>   |   |                                       |            |               |    |    |    |    |                          |    |    |  |              |            |
| <p><b>Project based learning:</b> Each student in a group of 4-5 will apply the concepts of Differential Equations and Laplace Transform to solve practical problems.</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.  | <p><b>Jain, R. K. &amp;Iyenger, S. R. K.,</b> Advanced Engineering Mathematics, 4<sup>th</sup> Ed., Alpha Science International, 2013.</p> |   |                                       |            |               |    |    |    |    |                          |    |    |  |              |            |

|    |  |
|----|--|
| 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> | 15B11PH111 | <b>Semester: ODD</b> | <b>Semester: 1<sup>st</sup> Session: 2022 -2023</b><br><b>Month from: September to December</b> |
| <b>Course Name</b> | PHYSICS-1  |                      |   |
| <b>Credits</b>     | 4          | <b>Contact Hours</b> | 3+1   |

|                        |  |                            |
|------------------------|--|----------------------------|
| <b>Faculty (Names)</b> | <b>Coordinator(s)</b>                  | Manoj Kumar and Anuj Kumar |
|                        | <b>Teacher(s)<br/>(Alphabetically)</b> |                            |

| <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 (7 M), Two quizzes (7 M), Assignments in PBL mode (6 M), and Internal assessment (5 M)] |           |
| <b>Total</b>  | <b>100</b>   |           |
| <p><b>Project Based Learning (PBL):</b> 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.</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>  | A. K. Ghatak, <i>Optics</i> , Tata McGraw Hill.                                       |
| <b>2.</b>  | E. Hecht, <i>Optics</i> , Pearson Education.  |
| <b>3.</b>  | F. A. Jenkins and H. E. White, <i>Fundamentals of optics</i> , Tata McGraw Hill.      |
| <b>4.</b>  | R. S. Sirohi, <i>Wave Optics</i> , Orient and Longman.                                |
| <b>5.</b>  | Reshnick, <i>Relativity</i> , New Age.  |
| <b>6.</b>  | A. Beiser, <i>Concepts of Modern Physics</i> , Mc Graw Hill International.            |
| <b>7.</b>  | Introduction to Quantum Mechanics by David J. Griffiths, Second Edition, Pearson.     |
| <b>8.</b>  | Quantum Mechanics by Ghatak and Lokanathan, 5 <sup>th</sup> Edition, Macmillan India. |

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

|                    |               |                      |  |
|--------------------|---------------|----------------------|--|
| <b>Course Code</b> | 15B17PH171    | <b>Semester: ODD</b> | <b>Semester: I Session: 2022-23</b><br><b>Month from Sept-22 to Jan-23</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>                  | Alok Pratap Singh Chauhan and S K Awasthi   |
|                        | <b>Teacher(s)<br/>(Alphabetically)</b> | Anibaran Pathak, Anuraj Panwar, Ashish Bhatnagar, Amit Verma, Anuj Kumar, Anshu D Varshney, B C Joshi, Dinesh Kumar, Manoj Tripathi, Manoj Kumar, Navendu Goswami, Papia Chowdhury, Prashant Chauhan, R. K. Dwivedi, Ravi Gupta, 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>           |

**Project based learning:** The project based on various concepts like Interference, Diffraction, Polarization, Modern Physics and basics of electricity and magnetism will be developed by every student of the group comprises of two or three students. Additionally by doing this each member of the group would able to learn the concept and its application to address the challenges associated with the project in the meaning full way.

**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, *Practical Physics*, Kalyani Publication.

2. Experiment hand-outs.



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

|                    |            |                      |  |
|--------------------|------------|----------------------|--|
| <b>Course Code</b> | 18B15GE112 | <b>Semester: ODD</b> | <b>Semester: I Session: 2022-23</b><br><b>Month from Sept-22 to Jan-23</b> |
| <b>Course Name</b> | Workshop   |                      |  |
| <b>Credits</b>     | 1.5        | <b>Contact Hours</b> | 03   |

|                        |  |  |
|------------------------|--|--|
| <b>Faculty (Names)</b> | <b>Coordinator(s)</b>                  | Prabhakar Jha, Nitesh Kumar  |
|                        | <b>Teacher(s)<br/>(Alphabetically)</b> | Chandan Kumar, Madhu Jhariya, Nitesh Kumar. Prabhakar Jha, and Rahul Kumar |

| <b>COURSE OUTCOMES</b> |   | <b>COGNITIVE LEVELS</b> |
|------------------------|---|-------------------------|
| <b>C179.1</b>          | Tell the basic of manufacturing environment and various safety measures associated with it.   | Remembering Level (C1)  |
| <b>C179.2</b>          | Apply the appropriate tools to fabricate joints utilizing work-bench tools.   | Applying Level (C3)     |
| <b>C179.3</b>          | Create various prototypes in the carpentry trade, fitting trade, and welding trade  | Creating Level (C6)     |
| <b>C179.4</b>          | Demonstrate the working principle of lathe, shaper and milling machines and able to fabricate the prototypes of desired shape and accuracies. | Understanding Level(C2) |

| <b>Module No.</b> | <b>Title of the Module</b> | <b>List of Experiments</b>   | <b>CO</b>   |
|-------------------|----------------------------|--|---|
| 1.                | Carpentry                  | Preparation of T joint as per the given specification.<br>Preparation of dovetail joint/ cross lap joint as per given specification.                                     | <b>C179.2,</b><br><b>C179.3</b>                   |
| 2.                | Welding Shop               | To study Gas welding and Arc welding equipment and various safety measures associated with it.<br>To make butt joint and lap joint.                                      | <b>C179.1,</b><br><b>C179.2,</b><br><b>C179.3</b> |
| 3.                | Sheet Metal Shop           | To prepare a square tray using GI sheet.<br>To prepare a funnel using GI sheet.  | <b>C179.2,</b><br><b>C179.3</b>                   |
| 4.                | Fitting Shop               | To prepare V- groove fit as per given specifications.<br>To prepare square fit as per given specifications.  | <b>C179.2,</b><br><b>C179.3</b>                   |
| 5.                | Machine Shop               | To perform turning, facing and grooving operation on Lathe.<br>To perform slotting operation on Shaper Machine.<br>To perform face milling operation on Milling Machine. | <b>C179.4</b>                                     |

**Evaluation Criteria**

**Components**

Viva 1

20

Viva 2

20

Report file, Attendance, and D2D

60 [File Work (20) + Attendance (10)+(Experimental Work (30))]

**Total**

**100**

**Project based learning:** Here students are divided in groups and learn about the applying of appropriate tools to fabricate joints utilizing work-bench tools which helps them in creating various prototypes in the field of

engineering and technology. In the present workshop laboratory with the application of the course outcomes, students prepare their projects like robotic car, cutting of electronic board made of wood, etc. where application of carpentry shop, sheet metal shop and fitting shop is required.

**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. | Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., “Elements of Workshop Technology”, Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai |
| 2. | Kalpakjian S. And Steven S. Schmid, “Manufacturing Engineering and Technology”, 4 <sup>th</sup> edition, Pearson Education India Edition, 2002.  |
| 3. | Rao P.N., “Manufacturing Technology”, Vol. I and Vol. II, Tata Mc GrawHill House, 2017.  |
| 4. | John K.C., Mechanical Workshop Practice, 2nd Edition, PHI, 2010  |
| 5. | Roy A. Lindberg, “Processes and Materials of Manufacture”, 4th edition, Prentice Hall India, 1998  |
| 6. | Gowri P.Hariharan and A. Suresh Babu,” Manufacturing Technology – I” Pearson Education, 2008   |
| 7. | Raghuwanshi B.S., Workshop Technology Vol. I & II, Dhanpath Rai & Sons.  |