Detailed Syllabus
Lecture-wise Breakup

Course Code	15B11CI111	**Semester** ODD **(specify Odd/Even)**	**Semester** I **Session:** 2023-24 **Month from:** August-23 to Dec-23
Course Name	Software Development Fundamentals – I		
Credits	4	**Contact Hours**	3-1-0

Faculty (Names)	**Coordinator(s)**	Dr. Anil Kumar Mahto (J62), Dr. Arti Jain (J128)
	Teacher(s) (Alphabetically)	**J62:** Amitesh, Dr. Anil Kumar Mahto, Dr. Ashish Mishra, Dr. Himansu S Pattanayak, Dr. K Rajalakshmi, Kirti Jain, Mradula Sharma, Prantik Biswas, Pushp, Dr. Suma Dawn **J128:** Dr. Arti Jain, Prof. Chetna Gupta, Dr. Himani Bansal, Dr. Laxmi Chaudhary, Dr. Rashmi Kushwah, Dr. Shruti Gupta, Dr. Shruti Jaiswal

COURSE OUTCOMES		**COGNITIVE LEVELS**
C109.1	Explain the logic for solving problems considering various phases of software development life cycle and depicting them using algorithms and flowcharts	Understand (Level 2)
C109.2	Explain basics of C programming concepts to make decision for solving problems	Understand (Level 2)
C109.3	Demonstrate and contrast different methods for writing modular programs in C	Understand (Level 2)
C109.4	Use various C programming constructs to implement iteration, and recursion	Apply (Level 3)
C109.5	Apply and implement arrays, pointers, structures and file handling for solving real-world problems	Apply (Level 3)

1. CO-PO and CO-PSO Mapping:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C109.1	**1**	**2**	**2**				**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**
	Slightly mapped to the knowledge of mathematics (puzzles) and engineering fundamentals (C programming)	Moderately mapped to analysis of problems related to engineering sciences (expression and conditional structure in C)	Moderately mapped to design and development of solutions using expression and conditional structure in C				Slightly mapped to sustainable solution using using expression and conditional structure in C	Slightly mapped to professional ethics and responsibilities	Slightly mapped to the individual and team work using assignment	Slightly mapped to the communication using PBL	Slightly mapped to project management using PBL through expression and conditional structure in C	Slightly mapped to the lifelong learning as similarities are presented between different programming skills	Slightly mapped to identification of suitable step by step solution (algorithm) of a problem	Moderately mapped to programming
C109.2	**2**	**1**	**1**				**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**
	Moderately mapped to the knowledge of	Slightly mapped to analysis of	Slightly mapped to design and develop				Slightly mapped to sustainable	Slightly mapped to profession	Slightly mapped to the individual and	Slightly mapped to the communication using	Slightly mapped to project management	Slightly mapped to the lifelong learning as	Slightly mapped to identification of suitable	Moderately mapped to programming

	mathematics (pointer arithmetic) and engineering fundamentals (C programming)	problems related to engineering sciences (arrays, string and pointer in C)	ment of solutions using arrays, string and pointer in C				solution using arrays, string and pointer in C	al ethics and responsibilities	team work using assignment	PBL	using PBL through array, string and pointers	similarities in arrays syntax are present across different programming skills	step by step solution (algorithm) of a problem based on array, string and pointers	based on the concept of array, string and pointers
C109.3	**2**	**2**	**1**				**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**
	Moderately mapped to the knowledge of mathematics (functions and recursive functions) and engineering fundamentals (C programming)	Moderately mapped to analysis of problems related to engineering sciences (function and recursive functions C)	Slightly mapped to design and development of solutions using function and recursive functions in C				Slightly mapped to sustainable solution using function and recursive functions in C	Slightly mapped to professional ethics and responsibilities	Slightly mapped to the individual and team work using assignment	Slightly mapped to the communication using PBL	Slightly mapped to project management using PBL through function and recursive functions.	Slightly mapped to the lifelong learning as similarities are present across different programming skills	Slightly mapped to identification of suitable step by step solution (algorithm) of a problem based on function and recursive functions	Moderately mapped to programmings based on the concept of function and recursive functions
C109.4	**2**	**1**	**2**				**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**
	Moderately mapped to the knowledge of mathematics and engineering fundamentals (structure and union)	Slightly mapped to analysis of problems related to engineering sciences (structure and union C)	Moderately mapped to design and development of solutions using structure and union in C				Slightly mapped to sustainable solution using structure and union in C	Slightly mapped to professional ethics and responsibilities	Slightly mapped to the individual and team work using assignment	Slightly mapped to the communication using PBL	Slightly mapped to project management using PBL through structure and union	Slightly mapped to the lifelong learning as similarities are present across different programming skills	Slightly mapped to identification of suitable step by step solution (algorithm) of a problem based on structure and union	Moderately mapped to programming based on the concept of structure and union
C109.5	**2**	**1**	**2**				**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**
	Moderately mapped to the knowledge of mathematics and engineering fundamentals (basic file operation such as fopen, fclose, etc)	Slightly mapped to analysis of problems related to engineering sciences (basic file operations)	Moderately mapped to design and development of solutions using basic file operations in C				Slightly mapped to sustainable solution using basic file operations in C	Slightly mapped to professional ethics and responsibilities	Slightly mapped to the individual and team work using assignment	Slightly mapped to the communication using PBL	Slightly mapped to project management using PBL through basic file operations	Slightly mapped to the lifelong learning as similarities are present across different programming skills	Slightly mapped to identification of suitable step by step solution (algorithm) of a problem based on basic file operations such as fopen, fclose, etc.	Moderately mapped to programming based on the concept of basic file operation such as fopen, fclose, etc
NBA Code:	**2**	**2**	**2**				**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**

C109														

Module No.	Subtitle of the Module	Topics in the Module	No. of Lectures for the module	CO Mapping
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	6	C109.1
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	8	C109.1, C109.2, C109.4
3.	Array	Fundamentals of Array, Implementation of 1D/2D Array and related operations like insertion, traversal, updation, etc. in C programming using different problems	7	C109.3, C109.5
4.	Pointers	Pointers in C, Dynamic memory allocation for 1D/2D array, Arithmetical operations on pointers	5	C109.5
5.	Functions	Introduction to Functions and its implementation in C programming language, Functions using Pass by value, functions using pass by reference, recursive functions	5	C109.3, C109.4, C109.5
6.	Structures and Union	Introduction and implementation of Structures and Union in C programming, Array of Structures, Pointer to Structures and related operations like insertion, traversal, updation, etc. in C programming using different problems, Structures using function	5	C109.3, C109.5
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	6	C109.5
		Total number of Lectures	**42**	

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25

(Attendance = 10, Class Test, Quiz = 05, Internal Assessment = 05, Assignments in PBL mode = 05)

Total	**100**

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 life-cycle, 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)

Text Books:

1.	Paul Deitel and Harvey Deitel, "C How to Program", 9th Edition, Pearson Education, 2023, ISBN: 978-0-13-739839-3
2.	E Balagurusamy, "Computing Fundamentals and C Programming", 2nd Edition, McGraw Hill Eduction, 2017, ISBN: 978-9352604166
3.	Greg Perry and Dean Miller, "C Programming Absolute Beginner's Guide Paperback", 3rd Edition, Que Publishing, 2013, ISBN: 978-0789751980
4.	Griffiths, David and Dawn Griffiths, "Head First C: A Brain-Friendly Guide", O'Reilly Media, Inc., 2012, ISBN: 978-9350236925
Reference Books:	
1.	Herbert Schildt, "The Complete Reference C", 4th Edition, McGraw Hill Education, 2017, ISBN: 978-0070411838
2.	Brian W. Kernighan and Dennis Ritchie, "The C Programming Language", 2nd Edition, Pearson Education India, 2015, ISBN: 978-9332549449
3.	Behrouz A. Forouzan, Richard F. Gilberg, B. G. Geetha and G. Singaravel,"Computer Science: A Structured Programming Approach Using C", 3rd Edition, Cengage Learning, 2009, ISBN: 978-8131507629

Detailed Syllabus

Lecture-wise Breakup

Course Code	15B11HS112	**Semester**: Odd	**Semester**: I **Session** 2023-24 **Month:** July-December	
Course Name	English			
Credits	2	**Contact Hours**	1-0-2	
Faculty (Names)	**Coordinator(s)**	Dr Ekta Singh, Dr Anshu Banwari		
	Teacher(s) (Alphabetically)	Dr Anshu Banwari, Dr Danish Siddiqui, Dr Deepak Verma, Dr Ekta Singh, Dr Ekta Srivastava, Dr Harleen Kaur, Dr Monali Bhattacharya, DrNilu Choudhary.		

COURSE OUTCOMES		**COGNITIVE LEVELS**
C114.1	Demonstrate an understanding of the basic aspects of English as a communication tool.	Understand (C2)
C114.2	Apply grammar concepts, vocabulary skills and phonetics for effective communication.	Apply (C3)
C114.3	Develop effective professional writing skills.	Apply (C3)
C114.4	Analyze rhetorical devices and literature for enhancing communication skills.	Analyze (C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	English as a Communication Tool	Basic aspects of English: LSRW: Listening, Speaking, Reading, Writing Non-Verbal Communication: Body Language, Voice Modulation, Posture Presentation Skills Phonetics: Transcription, Pronunciation	6
2.	Grammar & Vocabulary	Tense, Aspect, Mood and Voice Vocabulary Enrichment strategies	1
3	Language through Literature	Forms of Literature & Rhetorical Devices One act Play Refund by Fritz Karinthy Famous Speech Swami Vivekanand's Chicago Speech	3
4.	Professional Application/Writing	Textual Organization ·Notice, Agenda and Minutes ·Format of Report Writing	4
		Total number of Lectures	**14**

Evaluation Criteria	
Components	**Maximum Marks**
Mid Term	30
End Semester Examination	40
TA	30
Total	**100**

PBL Component: Students are required to submit a project report on the allotted topic. The project report should include literary and rhetorical devices to express their views effectively.

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.	**C.L.Bovee, J.V.Thill, M.Chaturvedi**, *Business Communication Today*,9th Ed, Pearson Education, Pvt Ltd,2021
2.	**Kelly M. Quintanilla and S.T.Wahl**, *Business and Professional Communication*, Sage Publications Pvt India Ltd,2011
3.	**S. Kumar and Pushp Lata,** *Communication Skills*, Oxford University Press,1st, Ed. 2011
4.	**R.K Bansal, and J.B Harrison**, *Spoken English for India*, Orient Longman, 2018
5	**M A Yadugiri,** The Pronunciation of English: Principles and Practice, Viva Books Pvt. Ltd, India, 2015
6	**A. R. Rizvi,** 'Effective Technical Communication' 2nd edition, McGraw Hill Education Private Limited, Chennai, 2018.
7	**Raymond Murphy,** English Grammar in Use, 5th edition, Cambridge University Press, 2019.
8	**Hewings, M**. *English Pronunciation in Use*. Advanced. Cambridge: CUP, 2009
9	**Krishna Mohan and N. P. Singh**, *Speaking English Effectively* 2nd Edition. Macmillan Publishers India Ltd. Delhi. 2011
10	**Suresh Kumar, E. &Sreehari, P**. *A Handbook for English Language Laboratories*. New Delhi: Foundation, 2009.
11	**Fritz Karinthy,** "*The Refund*",https://egyankosh.ac.in/bitstream/123456789/27478/1/Unit-4.pdf
12	**Swami Vivekananda &Sankar Srinivasan, "Sisters**& Brothers of America: Speech at World Parliament of Religions, Chicago, 1893", Creative Space Independent Publishing Platform, 2015

Detailed Syllabus
Lab-wise Breakup

Course Code	15B17PH171	**Semester: ODD**	**Semester: 1st Session:**2023 -2024 **Month from July 23 to December 24**
Course Name	Physics Lab-1		
Credits	01	**Contact Hours**	02

Faculty (Names)	**Coordinator(s)**	Alok P S Chauhan and S K Awasthi
	Teacher(s) (Alphabetically)	

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

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Optics	**1.**To determine the wavelength of sodium light with the help of Newton's rings setup **2.**To determine the wavelength of sodium light with the help of Fresnel's Bi-prism **3.** To find the specific rotation of cane- sugar solution by a polarimeter at room temperature, using half-shade / Bi-quartz device. **4.** To determine the dispersive power of the material of a prism with the help of a spectrometer. **5.** To determine the wavelength of prominent spectral lines of mercury light by a plane transmission grating using normal incidence method	1-5
2.	Modern Physics	**6.** To study the Photoelectric effect and determine the value of Planck's constant. **7.** Determination of Planck's constant by measuring radiation in a fixed spectral range.	1-5
3.	Electricity and Magnetism	**8.** To verify Stefan's law by electrical method. **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. **10.** To study the variation of magnetic field with distance, along the axis of Helmholtz galvanometer, and to estimate the radius of the coil.	1-5

Evaluation Criteria

Components	**Maximum Marks**
Mid Term Viva (V1)	20
End Term Viva (V2)	20

D2D	60
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Dey and Dutta, *Practical Physics*, Kalyani Publication.
2.	Experiment hand-outs.

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.

Detailed Syllabus
Lab-wise Breakup

Course Code	15B17PH171	**Semester: ODD**	**Semester: 1st Session:**2023 -2024 **Month from July 23 to December 24**
Course Name	Physics Lab-1		
Credits	01	**Contact Hours**	02

Faculty (Names)	**Coordinator(s)**	Alok P S Chauhan and S K Awasthi
	Teacher(s) (Alphabetically)	

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

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Optics	**1.**To determine the wavelength of sodium light with the help of Newton's rings setup **2.**To determine the wavelength of sodium light with the help of Fresnel's Bi-prism **3.** To find the specific rotation of cane- sugar solution by a polarimeter at room temperature, using half-shade / Bi-quartz device. **4.** To determine the dispersive power of the material of a prism with the help of a spectrometer. **5.** To determine the wavelength of prominent spectral lines of mercury light by a plane transmission grating using normal incidence method	1-5
2.	Modern Physics	**6.** To study the Photoelectric effect and determine the value of Planck's constant. **7.** Determination of Planck's constant by measuring radiation in a fixed spectral range.	1-5
3.	Electricity and Magnetism	**8.** To verify Stefan's law by electrical method. **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. **10.** To study the variation of magnetic field with distance, along the axis of Helmholtz galvanometer, and to estimate the radius of the coil.	1-5

Evaluation Criteria

Components	**Maximum Marks**
Mid Term Viva (V1)	20
End Term Viva (V2)	20

D2D	60
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Dey and Dutta, *Practical Physics*, Kalyani Publication.
2.	Experiment hand-outs.

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.

Detailed Syllabus
Lab-wise Breakup

Course Code	18B15GE112	**Semester:** ODD	**Semester:** I **Session:** 2023 -24 **Month-:** July-Dec
Course Name	Workshop		
Credits	1.5	**Contact Hours**	0-0-3

Faculty (Names)	**Coordinator(s)**	Nitesh Kumar (J62), Rahul Kumar (J128)
	Teacher(s) (Alphabetically)	J62- Chandan Kumar, Madhu Jhariya, Nitesh Kumar, Satyanarayan Patel and Shwetabh Singh. J128- Niraj Kumar, Prabhakar Jha, Rahul Kumar.

COURSE OUTCOMES		**COGNITIVE LEVELS**
C179.1	Tell the basic Introduction of various shops and safety measures associated with it.	Remembering Level (C1)
C179.2	Understand the working, usage and application of various Tools and Machines in various shops	Understanding Level(C2)
C179.3	Build the appropriate Work Plan for the prototype prepration in the various shops.	Applying Level (C3)
C179.4	Choose the appropriate Tools to fabricate joints utilizing work-bench tools in various shops.	Evaluating Level (C5)
C179.5	Create various prototypes in the carpentry trade, fitting trade, sheet metal and welding trade.	Creating Level (C6)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Carpentry	Preparation of T joint as per the given specification. Preparation of dovetail joint/ cross lap joint as per given specification.	**C179.2, C179.3, C179.4 C179.5**
2.	Welding Shop	To study Gas welding and Arc welding equipment and various safety measures associated with it. To make butt joint and lap joint.	**C179.1, C179.2, C179.3, C179.4, C179.5**
3.	Sheet Metal Shop	To prepare a square tray using GI sheet. To prepare a funnel using GI sheet.	**C179.2, C179.3, C179.4 C179.5**
4.	Fitting Shop	To prepare V- groove fit as per given specifications. To prepare square fit as per given specifications.	**C179.2, C179.3, C179.4, C179.5**

5.	Machine Shop	To perform turning, facing and grooving operation on Lathe. To perform slotting operation on Shaper Machine. To perform face milling operation on Milling Machine. To study G and M Codes for a CNC Machining.	**C179.1, C179.2**

Evaluation Criteria

Components	**Maximum Marks**
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",4th 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.

Mathematics-1 (15B11MA111)

Partial differentiation, Taylor's series, maxima and minima, Jacobians, multiple integrals, gradient, divergence and curl, normal and tangent to a surface, line and surface integrals, Gauss and Stokes theorems, differential equations with constant coefficients, Cauchy-Euler's equation, Laplace transforms, matrices, row echelon form, Gauss elimination method, rank, eigenvalues and eigenvectors, quadratic forms.

Course Description

Course Code	15B11MA111	**Semester** Odd	**Semester** I **Session** 2023-24 **Month from** Aug 2023- Dec 2023	
Course Name	Mathematics-1			
Credits	4	**Contact Hours**	3-1-0	
Faculty (Names)	**Coordinator(s)**	Prof. Lokendra Kumar, Dr. Neha Ahlawat		
	Teacher(s) (Alphabetically)			

COURSE OUTCOMES		**COGNITIVE LEVELS**
After pursuing the above mentioned course, the students will be able to:		
C105.1	Define the basics of matrices and calculus of functions of one or more variables.	Remembering (C1)
C105.2	Explain the concepts of calculus, matrices and Laplace transforms.	Understanding (C2)
C105.3	Make use of the concepts of matrices, calculus, differential equations and Laplace transforms in solving engineering problems	Applying (C3)
C105.4	Simplify and solve various problems of vector calculus, differential equations and Laplace transforms in engineering problems.	Analyzing (C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
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
		Total number of lectures	**42**

Evaluation Criteria

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

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.

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.	**Jain, R. K. &Iyenger, S. R. K.,** Advanced Engineering Mathematics, Alpha Science International.
2.	**Prasad, C.,** (a) Mathematics for Engineers (b) Advanced Mathematics for Engineers, Prasad Mudranalaya.
3.	**Lipschutz, S., Lipsom, M.,** Linear Algebra, Schaum Outline Series.
4.	**Thomas, G. B and Finney, R. L**., Calculus and Analytical Geometry, Pearson Education Asia (Adisson Wesley), New Delhi.

CO-PO and CO-PSO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C105.1	2	2	1	1								2		
C105.2	2	2	2	2								2		
C105.3	3	3	3	2								2		
C105.4	3	3	3	2					1			2		
Avg.	**2.50**	**2.50**	**2.25**	**1.75**					**1**			**2**		

Detailed Syllabus
Lecture-wise
Breakup

Course Code	**15B17CI171**	**Semester** ODD	**Semester: 1st Session: 2023 -2024** **Month from: July –Dec**
Course Name	Software Development Fundamentals Lab-1		
Credits	1	**Contact Hours**	4

Faculty (Names)	**Coordinator(s)**	Amitesh (J62), Dr. Rashmi Kushwah (J128)
	Teacher(s) (Alphabetically)	Aditi Sharma, Akanksha Mehndiratta, Akanksha Bhardwaj, Anil Kumar Mahto, Ankita Verma, Anuradha Gupta, Arpita Jadhav Bhatt, Arti Jain, Asmita Yadav, Gaurav K. Nigam, Himani Bansal, Himanshu Agrawal, K Rajalakshmi, Kavita Pandey, Kirti Aggarwal, Kirti Jain, Laxmi Chaudhary, Megha Rathi, Parul Agarwal, Payal Khurana Batra, Raju Pal, Rashmi Kushwah, Sangeeta Mittal, Shruti Jaiswal, Suma Dawn

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

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Weeks (2 Labs/Week)**	**CO Mapping**
1	Flow chart and Logic Building	Developing logic/flow-chart/pseudo code to solve problems, simple/logical games, puzzles	2 Weeks	C172.1
2	Data Type, Statements, Expressions, Operators	Data, variables and constants, data types, operators – binary, unary, ternary, operator precedence, associativity	1 Week	C172.1
3	Control Flow	Develop C programs using conditional structure (if, if-else, nested if), and iterative control structure (do-while, while, for). Implement switch case statement.	2 Weeks	C172.1

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	C172.2
5	Pointers	Pointers in C, Dynamic memory allocation for 1D/2D array, Arithmetical operations on pointers, recursive functions like palindrome, factorial, fibonacci series, number system etc	2 Weeks	C172.2, C172.3
6	Functions	User defined functions and inbuilt functions, Functions definition, declaration, calling, Pass by value, functions using pass by reference, functions with array	1 Week	C172.2, C172.3
7	Structures and Union	Struct keyword, Structure and Union, Structure variable, dot operator, pointer to structures, arrow operator, Array of Structures, structure using functions.	2 Weeks	C172.4, C172.2
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	C172.5
Total Number of Weeks			14 Weeks	

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.

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
Total	**100**

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

1	Paul Deitel and Harvey Deitel, "C HOW TO PROGRAM", 9th Edition, Pearson Education, 2023, ISBN 978-0-13-739839-3
2	H. Cooper and H. Mullish, Jaico Publishing House. "Spirit of C", 4th Edition, Jaico Publishing House, 2006
3	Herbert Schildt. "The Complete Reference C ", 4th Edition, TMH, 2000
4	Brian W. Kernighan and Dennis M. Ritchie ,"The C Programming Language", 2nd Edition, Prentice-Hall India, New Delhi, 2002
5	Peter Norton, "Introduction to Computers", 5th edition, Tata McGraw-Hill, Delhi., 2005.
6	Balaguruswamy, Programming in ANCI C", 2nd Edition, TMH, 2001.
7	Ashok N. Kamthane , "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2003
8	Rajaraman V., "Fundamentals of Computer", 3rd Edition, Prentice-Hall India, New Delhi, 2005.
9	B. A. Forouzan, R. F. Gilberg "Computer Science: A Structured Programming Approach Using C", 2nd Edition, Thomson Press, New Delhi, 2006.
10	Avi Silberschatz, Henry F. Korth, and S. Sudarshan, "Database System Concepts", 6th edition, McGraw-Hill, 2010.