# Lecture-wise Breakup

Course Code	15B11Cl111	Semester ODD (specify Odd/Even)		Semester I.         Session         2019 - 2020           Month from         July 2019 to Dec 2019		
Course Name	Software Development Fundamentals-I					
Credits	4		Contact H	ours	3 (L) + 1(T)	

Faculty (Names)	Coordinator(s)	Arpita Jadhav Bhatt & Amarjeet Kaur ( J62) + Raju Pal (J128)
	Teacher(s) (Alphabetically)	Akanksha Bhardwaj, Amanpreet Kaur, Amarjeet Kaur, Arpita Jadhav Bhatt, Himanshu Mittal, K Vimal Kumar, Mukesh Saraswat, Mradula Sharma, Neetu Sardana, Niyati Aggrawal, Raju Pal, Sakshi Agarwal, Shailesh Srivastava, Shardha Porwal, Shulabh Tyagi

COURSE O	UTCOMES	COGNITIVE LEVELS
C109.1	Solve puzzles , formulate flowcharts, algorithms and develop HTML	Apply Level
	code for building web pages using lists, tables, hyperlinks, and frames	(Level 3)
C109.2	Show execution of SQL queries using MySQL for database tables and	Understanding Level
	retrieve the data from a single table.	(Level 2)
C109.3	Develop python code using the constructs such as lists, tuples,	Apply Level
	dictionaries, conditions, loops etc. and manipulate the data stored in MySQL database using python script.	(Level 3)
C109.4	Develop C Code for simple computational problems using the control	Apply Level
	structures, arrays, and structure.	(Level 3)
C109.5	Analyze a simple computational problem into functions and develop a	Analyze Level
	complete program.	(Level 4)

C109.6	Interpret	different	data	representation	,	understand	precision,	Understanding Level
	accuracy a	and error						(Level 2)

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Introduction to Scripting Language & Algorithmic Thinking	Introduction to HTML, Tagging v/s Programming, Algorithmic Thinking and Problem Solving, Introductory algorithms and flowcharts	5
2.	Developing simple software applications with scripting and visual languages	Developing simple applications using python; data types (number, string, list), operators, simple input output, operations, control flow (if -else, while)	4
3.	Elementary Database	Introduction to data base system, Single Table applications, basic operations : ADD,DELETE,UPDATE,SELECT, ALTER ,Introduction to primary key	4
4.	C Programming	Syntax and semantics, data types and variables, expressions and assignments, array and struct, simple I/O, conditional and iterative control structures Programs on unit conversion, approximating the square root of a number, finding the greatest common divisor, average, sum, min, max of a list of numbers, common operations on vector, matrix, polynomial, strings, programs for pattern generation	15
5.	Functions in C Programming	Functions and parameter passing (numbers, ,characters, array, structure), recursion, e.g. factorial, Fibonacci, Scope of variable	8
6.	Data base connectivity using MySQL	Creating Web pages with Database connectivity using MySQL	2
7.	Aspects of numerical computing	Data representation , Understanding precision, accuracy, error, Introduction to Scientific Computation	4

		Total number of Lectures	42
Evaluation Criteria			
Components	Maximum Marks		
T1	20		
T2	20		
End Semester Examination	35		
ТА	25		
Total	100		

Reco	mmended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books,
Refe	rence 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
2.	Herbert Schildt. "The Complete Reference C ", 4 <sup>th</sup> Edition, TMH, 2000
3.	Brian W. Kernighan and Dennis M. Ritchie ,"The C Programming Language", 2 <sup>nd</sup> Edition, Prentice-Hall India, New Delhi, 2002
4.	Peter Norton, "Introduction to Computers", 5 <sup>th</sup> edition, Tata McGraw-Hill, Delhi., 2005.
5	Balaguruswamy, Programming in ANCI C", 2 <sup>nd</sup> Edition, TMH, 2001.
6.	Ashok N. Kamthane , "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2003
7.	Rajaraman V., "Fundamentals of Computer", 3 <sup>rd</sup> Edition, Prentice-Hall India, New Delhi, 2005.
8.	B. A. Forouzan, R. F. Gilberg "Computer Science: A Structured Programming Approach Using C", 2 <sup>nd</sup> Edition, Thomson Press, New Delhi, 2006
9.	Avi Silberschatz, Henry F. Korth, and S. Sudarshan, "Database System Concepts", 6 <sup>th</sup> edition, McGraw-Hill, 2010.
10.	

User manuals supplied by department for SQL and Python

# Lab-wise Breakup

Course Code	15B17Cl171	Semester : ODD		Semes	ter 1 <sup>st</sup>	Session	2019 -2020
		(specify Odd/Even)		ven) Month from July to December		mber	
Course Name	Software Development Fundamentals 1 Lab						
Credits	2		Contact	Hours		4	

Faculty	Coordinator(s)	Aditi Sharma & Sonal (62), Payal Khurana Batra
(Names)	Teacher(s) (Alphabetically)	Amarjeet Kaur, Amarjeet Prajapati, Ankit Vidyarthi, Ankita Wadhwa, Ashish Mishra, Bharat Gupta, Dhanlakhsmi, Dharmveer Singh Rajpoot, Kirti Aggrawal, Mradula Sharma, Neetu Sardana, Niyati Aggrawal, Parul Agarwal, Prashant Kaushik, Purtee Kohli, Sakshi Agarwal, Sandeep Singh, Sarishty Gupta, Shardha Porwal, Sherry Garg, Suma Dawn, <b>(62)</b> Akankasha Bhardwaj, Anurag Goel, Avinash Pandey Gaurav Nigam, Himani Bansal, Sudhanshu Kulshrestha, Pulkit Mehndiratta Rashmi Kushwah, Varsha Garg. (128)

COURSE O	UTCOMES	COGNITIVE LEVELS
C172.1	Design HTML code for building web pages using lists, tables, hyperlinks, and frames.	Apply (level 3)
C172.2	Develop python programs for constructs such as lists, tuples, dictionaries, conditions and loops using Python 3.6.	Apply(level 3)
C172.3	Design simple SQL queries using MySQL to create database tables and retrieve the data from a single table.	Apply (level 3)
C172.4	Develop C programs for datatypes, expressions, conditional structure, and iterative control structure and pattern generation using Code Blocks and Virtual Lab.	Apply (level 3)
C172.5	Design C programs for array, structure, and functions using Code Blocks and Virtual Lab.	Apply (level 3)

Module No.	Title of the Module	List of Experiments	CO		
1.	Introduction to HTML	Experiments to create web pages using tags, lists, tables, frames, forms.	C172.1		
2.	Python	Experiments to develop python programs using data types (number, string, list), operators, simple input output operations, control flow (if -else, while)			
3.	MySQL	Experiments to create MySQL queries using operations like ADD, DELETE, UPDATE, SELECT	C172.3		
4.	C Programming (Part-1)	Experiments to develop C programs using datatypes, expressions, conditional structure (if-else), and iterative control structure (do-while, while, for).	C172.4		
5.	C Programming (Part-2)	Experiments to develop C programs using for array, structure, and functions.	C172.5		
Evaluation	Criteria				
<b>Componer</b> Evaluation Lab Test 1 Evaluation Evaluation Lab Test 2 TA	<b>hts</b> 1 2 3	Maximum Marks 15 20 20 15 20 10			
Total		100			

Reco (Tex	<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.	H. Cooper and H. Mullish, Jaico Publishing House. "Spirit of C", 4th Edition, Jaico Publishing House, 2006				
2.	Herbert Schildt. "The Complete Reference C ", 4th Edition, TMH, 2000				
3.	Brian W. Kernighan and Dennis M. Ritchie, "The C Programming Language", 2nd Edition, Prentice-Hall India, New Delhi, 2002				
4.	Peter Norton, "Introduction to Computers", 5th edition, Tata McGraw-Hill, Delhi., 2005.				
5.	Balaguruswamy, Programming in ANCI C", 2nd Edition, TMH, 2001.				

6.	Ashok N. Kamthane, "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2003
7.	B. A. Forouzan, R. F. Gilberg "Computer Science: A Structured Programming Approach Using C", 2nd Edition, Thomson Press, New Delhi, 2006.
8.	https://www.w3schools.com/html/
9.	https://www.w3schools.com/sql/
10.	https://www.w3schools.com/python/
11.	User manuals supplied by department for HTML, SQL and Python

### <u>Detailed Syllabus</u> Lecture-wise Breakup

Course Code	15B11HS112	Semester: Odd		Semester: I Session 2019-2020	
				Month from July 19 to Dec 19	
Course Name	English				
Credits	3		Contact Hours		2-1-0

Faculty (Names) Coordinator(s)		Dr Ekta Srivastava, Ms Puneet Pannu
	Teacher(s) (Alphabetically)	Dr Anshu Banwari, , Dr Ekta Srivastava, Dr Monali Bhattacharya, Dr Nilu Chaudhary, Dr Parineeta Singh, Ms Puneet Pannu , Dr Santosh Dev, Dr. Santoshi Sengupta

COURSE	COGNITIVE LEVELS	
C114.1	Develop an understanding and appreciate the basic aspects of English as a communication tool.	Understand (C2)
C114.2	Apply the acquired skills in delivering effective presentations	Apply (C3)
C114.3	Demonstrate an understanding of different forms of literature and rhetorical devices	Understand (C2)
C114.4	Examine literature as reflection of individual and society	Analyse (C4)
C114.5	Compose different forms of professional writing	Create (C6)
C114.6	Apply Phonetics through theory and practice for better pronunciation	Apply (C3)

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 Gambits Phonetics: Pronunciation Stress Rhythm Intonation	10
		rioneties. rionalientien, suess, Kirytiin, intenation	

2.	Language through	Short Stories	10	
	Literature	·Too Bad by Isaac Asimov		
		·The Castaway by Rabindranath Tagore		
		Poems		
		·The Highwayman by Alfred Noyes		
		·Where the mind is without fear by Rabindranath Tagore		
		·"If" by Rudyard Kipling		
		·Ode to Clothes by Pablo Nerruda		
		One act Play		
		·Refund by Fritz Karinthy		
		Famous Speech		
		·Swami Vivekanand's Chicago Speech		
3.	Professional	Textual Organization	8	
	Application/Writing	·Letter Writing		
		·Circulars		
		·Notices		
		·Agenda		
		·Minutes		
		·Report Writing		
		Total number of Lectures	28	
Evaluation	n Criteria			
Componer	nts N	Maximum Marks		
T1		20		
T2		20		
End Semester Examination		35		
1 A Total		25 (Creative Project, Lab Test, Oral Questions)		
IUIAI		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.	<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.	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	Alfred Noyes, "The Highwayman", Oxford University Press, USA, Sep 1999
6	Rabindranath Tagore, "Where the Mind is without Fear", BK Classics

7	Rudyard Kipling, "If", If Handbook, Creative Editions, 2014
8	Pablo Neruda, "Ode To Clothes" Late & Posthumous Poems, 1968-74
9	Isaac Asimov, "Too Bad", Robot Visions, ROC Books, New York, NY, USA, 1991
10	RabindraNath Tagore, " <i>The Castaway</i> ", Selected Short Stories, Introduction & translated by William Radice", Penguin Classics, 2005
11	Fritz Karinthy, "The Refund", A Play in One Act adapted by Percival Wilde, French's Acting Edition, London, 1958
12	<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

#### Lecture-wise Breakup

Course Code	15B11PH111	Semester: ODD		Semester: 1 <sup>st</sup> Session: 2019 -2020 Month from July 19 to December 19		
Course Name	PHYSICS-1					
Credits	4	Contact Hours 3+1		3+1		

Faculty (Names)	Coordinator(s)	Suneet Kumar Awasthi & Dinesh Tripathi
	Teacher(s) (Alphabetically)	Alok Pratap Singh Chauhan, Anuj Kumar, Anuraj Panwar, Anshu D. Varshney, Ashish Bhatnagar, Bhubesh Chander Joshi, D. K. Rai, Himanshu Pandey, Manoj Kumar, Manoj Tripathi, S. C. Katyal, Sandeep Chhoker, Vikas Malik

COURSE O	UTCOMES	COGNITIVE LEVELS
C101 1	Recall the basic principles of physics related to optics, relativity,	Remembering (C1)
C101.1	quantum mechanics, atomic physics and thermodynamics.	
C101 2	Illustrate the various physical phenomena with interpretation	Understanding (C2)
C101.2	based on the mathematical expressions involved.	
C101 3	Apply the concepts/principles to solve the problems related to	Applying (C3)
C101.5	wave nature of light, relativity, quantum mechanics and atomic physics.	
C101 4	Analyze and examine the solution of the problems using physical	Analyzing (C4)
C101.4	and mathematical concepts involved.	

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Physical Optics	Analytical treatment of interference, Intensity distribution of fringe system, Fresnel's Biprism, Newton's rings, Michelson interferometer, Diffraction (limited to	15

		Fraunhoffer 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. Optical activity, Polarimeter		
2.	Relativity	Michelson-Morley experiment, Lorentz transformations, Addition of velocities, Mass variation with velocity, Mass- energy relation.	5	
3.	Radiation Black body radiation, Wein's law, Rayleigh Jeans law, Planck's law of radiation.			
4.	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, potential barrier and Harmonic oscillator.	9	
5.	Atomic Structure	Origin of spectral lines, spin and orbital angular momentum, Quantum numbers, Atoms in magnetic field, Zeeman effect.	4	
6. Thermodynamics		Review of the basic laws of thermodynamics, Entropy and Clausius-Cleyperon equation.	4	
		Total number of Lectures	40	
Evaluation	Criteria			
Components T1 T2 End Semester Examination TA Total		Maximum Marks 20 20 35 25 [2 Quiz (10 M), Attendance (10 M) and Cass performance 100	(5 M)]	

<b>Reco</b> Refe	Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. ( Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)		
1.	A. K. Ghatak, <i>Optics</i> , Tata McGraw Hill.		
2.	E. Hecht, <i>Optics</i> , Pearson Education.		
3.	F. A. Jenkins and H. E. White, Fundamentals of optics, Tata McGraw Hill.		
4.	R. S. Sirohi, Wave Optics, Orient and Longman.		

5.	Reshnick, <i>Relativity</i> , New Age.
6.	A. Beiser, Concepts of Modern Physics, Mc Graw Hill International.
7.	Mark W. Zemansky, Thermodynamics, Tata McGraw Hill.

#### Lab-wise Breakup

Course Code	15B17PH171	Semester: ODI	D	Semester: 1 <sup>st</sup> Session: 2019 -2020 Month from July 19 to December 19	
Course Name	Physics Lab-1				
Credits 01			Contact H	ours	02

Faculty (Names)	Coordinator(s)	B. C. Joshi and Anshu D. Varshney
	Teacher(s) (Alphabetically)	Alok Pratap Singh Chauhan, Amit Verma, Anuj Kumar, Anirban Pathak, Anuraj Panwar, Ashish Bhatnagar, Dinesh Tripathi, Himanshu Pandey, Manoj Kumar, Manoj Tripathi, N. K. Sharma, Navendu Goswami, Papia Chowdhury, Prashant Chauhan, R. K. Dwivedi, S. C. Katyal, S. K. Awasthi, S. P. Purohit, Sandeep Chhoker, Vikas Malik, Vivek Sajal

COURSE O	UTCOMES	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	со
1.	Optics	<ol> <li>To determine the wavelength of sodium light with the help of Newton's rings setup</li> <li>To determine the wavelength of sodium light with the help of Fresnel's Bi-prism</li> <li>To find the specific rotation of cane- sugar solution by a</li> </ol>	1-5

		polarimeter at room temperature, using half-shade / Bi-			
		quartz device.			
		<ul> <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> </ul>			
2.	Modern Physics	6. To study the Photoelectric effect and determine the	1-5		
		value of Planck's constant.			
		7 Determination of Planck's constant by measuring			
		radiation in a fixed spectral range.			
3.	Electricity and	<b>8.</b> To verify Stefan's law by electrical method.	1-5		
	Magnetism				
		<b>9.</b> 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.			
		<b>10.</b> To study the variation of magnetic field with distance, along the axis of Helmholtz galvanometer, and to estimate the radius of the coil.			
Evaluation	Evaluation Criteria				
Componen	ts N	Iaximum Marks			
Mid Term Viva (V1)		20			
End Term V	viva (V2)	20			
D2D		60			
Total		100			

<b>Reco</b> Refe	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.		

Lab-wise Breakup						
Course Code	18B15GE111	Semester : Odd (specify Odd/Even)		Semeste Month f	Semester:   Session 2019-2020 Month from: July to Dec	
Course Name	Engineering Drawing and Design					
Credits	lits 1.5		Contact H	ours	0-0-3	

Faculty (Names)	Coordinator(s)	Madhu Jhariya, Deepak Kumar
	Teacher(s) (Alphabetically)	Chandan Kumar, Nitesh Kumar, Vimal Saini

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

Module No.	Title of the Module	List of Experiments	со
1.	Introduction to Engineering Drawing	<ul> <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> <li>Constructing a pentagon and hexagon; engineering curves: Parabola, Ellipse, Hyperbola, Cycloids and Involutes.</li> </ul>	C178.2
2.	Orthographic	• <b>Projection of points:</b> Point on VP, HP, in space.	C178.3

	Projections	<ul> <li>Projection of straight lines: Lines inclined or parallel to any one of the planes; lines inclined to both HP and VP with traces.</li> <li>Projection of planes: Plane on VP, HP, inclined to any one of the planes; plane inclined to both HP and VP.</li> </ul>			
3	<b>3.</b> Projections of Regular Solids       • Projections of solids in simple position, inclined to one/both the planes.		C178.3		
4	Sections and Sectional Views of Right Angular Solids	<ul> <li>Sections of solids: 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> <li>Development of surfaces: Development of standard solids and sectioned solids.</li> </ul>	C178.3		
5	. Isometric Projections	• 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.	C178.4		
6	Overview of Computer Graphics	<ul> <li>Prview of</li> <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>			
7	Customization & CAD Drawing	• CAD Drawing along with customization tools, Annotations, layering & other functions. Orthographic Projections; Model Viewing; Co-ordinate Systems; Multi- view Projection; Surface Modeling; Solid Modeling.	C178.5		
8	Demonstration of a simple team design project	• Technical 2D/3D orthographic and Isometric projections; Demonstration of a simple team design project.	C178.5		
Evaluat	ion Criteria Compone	nts Maximum Marks			
Mid-Te End-Te (Attend	erm rm dance + D2D)	20 20 60 (10+50)			
Total		100			
<b>Recom</b> Referer	mended Reading mate	erial: Author(s), Title, Edition, Publisher, Year of Publication etc. eports, Websites etc. in the IEEE format)	(Text book		
1. <sup>B</sup>	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.	Agrawal B. & Agrawal C. M., Engineering Graphics, TMH Publication, 2012.
4.	Narayana, K.L. & P Kannaiah, Text book on Engineering Drawing, Scitech Publishers, 2008

## Lecture-wise Breakup

Course Code		15B11MA111	Odd Semester I Semester I S Month from: J		Session 2019 -2020 July 2019- December 2019	
Course Name		Mathematics I				
Credits		4 Contact Hours 3-1-0		)		
Faculty (Names)		Coordinator(s)	Dr. Pankaj Kumar Srivastava and Dr. Yoge			esh Gupta
		Teacher(s) (Alphabetically)	Dr. Anuj Bhardwaj, Dr. Dinesh Bisht, Dr. Himanshu Aga Lokendra Kumar, Dr. Neha Ahalawat, Dr. Pankaj Kumar Dr. Pato Kumari, Dr. Pinkey Chauhan, Prof. R. C. Mittal, Sheetal Deshwal, Dr. TraptiNeer and Dr. Yogesh Gupta			Himanshu Agarwal, Dr. Pankaj Kumar Srivastava, of. R. C. Mittal, Dr. Yogesh Gupta
COURSE OUTC		OMES			COGNITIVE LEVELS	
After pursuing the		above mentioned course, the students will be able to:				
C105.1	Explai functio	xplain the concepts of limits, continuity and differentiability of understanding Level Understanding Level			Understanding Level (C2)	
C105.2	Explai and ap	Explain the Taylor's series expansion of functions of several variables nd apply it in finding maxima and minima of functions. Applying Level (C3)			Applying Level (C3)	
C105.3	Make use of double and triple integrals to find area and volume of curves and surfaces. Applying Level (C3)			Applying Level (C3)		
C105.4	Explain the concepts of vector calculus and apply Green's, Stoke's and Gauss divergence theorems in engineering problems.Applying Level (C3)					
C105.5	Solve the ordinary differential equations and explain the concepts of Laplace transform for solving engineering problems.Applying Level (C3)				Applying Level (C3)	
C105.6	Utilize matrix algebra for solving a system of linear equations and Apply explain eigenvalues, eigenvectors, diagonalization and quadratic form.			Applying Level (C3)		

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 integra	Is 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 Integrat	tion 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 Transf	form 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
			10
		Total number of Lectures	42
Eval	uation Criteria	Total number of Lectures	42
Eval Com T1 T2 End TA Tota	<b>uation Criteria</b> <b>ponents</b> Semester Examinational	Total number of Lectures Maximum Marks 20 20 on 35 25 (Quiz , Assignments, Tutorials) 100	42
Eval Com T1 T2 End TA Tota Reco Refer	uation Criteria nponents Semester Examination I ommended Reading n rence Books, Journals,	Maximum Marks         20         20         on       35         25 (Quiz , Assignments, Tutorials)         100         naterial: Author(s), Title, Edition, Publisher, Year of Publication etc.         Reports, Websites etc. in the IEEE format)	42 ( Text books,
Eval Com T1 T2 End TA Tota Reco Refer	uation Criteria nponents Semester Examination I ommended Reading n rence Books, Journals, Jain, R. K. &Iyenge New Delhi, 2008.	Maximum Marks         20         20         on       35         25 (Quiz , Assignments, Tutorials)         100         naterial: Author(s), Title, Edition, Publisher, Year of Publication etc.         Reports, Websites etc. in the IEEE format)         er, S. R. K., Advanced Engineering Mathematics, 3 <sup>rd</sup> Ed., Narosa Publication	42 ( Text books, ublishing House,
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