Appreciate the importance of physics of materials for various engineering applications.

EVALUATION METHOD TO BE USED:

SI. no	Category of Courses	Continuous Assessment	Mid – Semester Assessment	End Semester
1.	Theory Integrated with Practical	15(T) + 25 (P)	20	40

MA6151	MATHEMATICS		Т	Р	EL	CREDITS
-		3	1	0	3	5

OBJECTIVES:

- To gain proficiency in calculus computations.
- To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems.
- To familiarize the student with functions of several variables.
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage.

MODULE I	SINGLE VARIABLE FUNCTIONS	L	Т	Р	EL
		3	1	0	3

Representation of functions - New functions from old functions - Limit of a function - Limits at infinity -Continuity.

SUGGESTED ACTIVITIES:

Problem solving sessions

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE II	DIFFERENTIALCALCULUS	L	T	Р	EL
		3	1	0	3

Derivatives - Differentiation rules - intermediate theorem - Rolle's theorem- Maxima and Minima of functions of one variable.

SUGGESTED ACTIVITIES:

- Problem solving sessions
- Applications in real life problems

SUGGESTED EVALUATION METHODS:

Tutorial problems

- Assignment problems
- Quizzes

MODULE III FUNCTIONS OFSEVERALVARIABLES	L	Т	Р	EL
	3	1	0	3

Partial derivatives – Homogeneous functions and Euler's theorem – Total derivative – Differentiation of implicit functions – Change of variables – Jacobians

SUGGESTED ACTIVITIES:

- Problem solving sessions
- Applications in real life problems

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE IV CALCULUS	MULTI VARIABLE DIFFERENTIAL	L	Т	Р	EL
		3	1	0	3

Partial differentiation of implicit functions – Taylor's series for functions of two variables – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

SUGGESTED ACTIVITIES:

- Problem solving sessions
- Flipped Class room

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE V	INTEGRALCALCULUS	L	Т	Р	EL	
		3	1	0	3	

Definite and Indefinite integrals - Substitution rule - Techniques of Integration - Integration by parts

SUGGESTED ACTIVITIES:

Problem solving sessions

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE VI	MORE ON INTEGRAL CALCULUS	L	Т	Р	EL			
		3	1	0	3			
Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction,								

Integration of irrational functions - Improper integrals

SUGGESTED ACTIVITIES:

Problem solving sessions

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE VII	MULTIPLEINTEGRALS	L	Т	Р	EL
		3	1	0	3

Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves

SUGGESTED ACTIVITIES:

- Problem solving sessions
- Flipped Class room

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE VIII	VOLUME INTEGRALS	L	Т	Р	EL
		3	1	0	3

Triple integrals – Volume of solids – Change of variables in double and triple integrals.

SUGGESTED ACTIVITIES:

Problem solving sessions

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE IX	L	Т	Р	EL
	3	1	0	3

Methods of variation of parameters - Method of undetermined coefficients -

SUGGESTED ACTIVITIES:

Problem solving sessions

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE X:	L	T	Р	EL
	3	1	0	3

Homogenous Equation of Euler's And Legendre's Type – System of Simultaneous Linear Differential Equations with Constant Coefficients.

SUGGESTED ACTIVITIES:

Problem solving sessions

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

OUTCOMES:

Upon completion of the course, the students will be able to:

- Use both the limit definition and rules of differentiation to differentiate functions.
- Apply differentiation to solve maxima and minima problems.
- Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
- Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
- Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.
- Determine convergence/divergence of improper integrals and evaluate convergent improper integrals.
- Apply various techniques in solving differential equations.

TEXTBOOKS:

- 1. James Stewart, "Calculus with Early Transcendental Functions", Cengage Learning, New Delhi, 2008.
- 2. Narayanan S. and Manicavachagom Pillai T. K., "Calculus" Volume I and II,S. Viswanathan Publishers Pvt. Ltd., Chennai, 2007.
- 3. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi,43 Edition, 2014.

REFERENCES:

- 1. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co. Ltd., New Delhi, 11thReprint,2010.
- 2. Erwin Kreyszig, "Advanced Engineering Mathematics", John Wiley and Sons, 9thEdition, New Delhi,2014.
- 3. Jain R.K. and Iyengar S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi. 3rd Edition.2007.
- 4. Bali N., Goyal M. and Watkins C., "Advanced Engineering Mathematics", Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.,), New Delhi, 7thEdition,2009.
- 5. Greenberg M.D., "Advanced Engineering Mathematics", Pearson Education, New Delhi, 2nd Edition, 5th Reprint, 2009.
- 6. Peter V.O'Neil, "Advanced Engineering Mathematics", Cengage Learning India Pvt., Ltd, New Delhi,2007.

EVALUATION METHOD TO BE USED:

SI. no	Category of Courses	Continuous Assessment	Mid – Semester Assessment	End Semester
1.	Theory	40	20	40

CS6101	PROGRAMMING WITH C	L	Т	Р	EL	CREDITS	
		2	1	4	3	6	

Prerequisites for the course: None

OBJECTIVES:

- To learn programming using a structured programming language.
- To implement programs using basic features of C.
- To learn to use C pointers and dynamically allocated memory techniques.
- To learn advanced features of the C programming language
- To be able to use file operations in C

MODULE I:		Т	Р	EL	
	2	1	4	3	

Notion of memory, addresses, variables, instructions, execution of instructions. Operating system commands, file editing, compiling, linking, executing a program.

SUGGESTED ACTIVITIES:

Practical - Use of operating system commands and file editing operations.

SUGGESTED EVALUATION METHODS:

• Exercises on the use of operating system commands and file editing operations.

MODULE II:	L	T	Р	EL
	2	1	4	3

Data types - constants, variables - arithmetic operators - expressions - basic input/output. Relational, logical, increment, decrement operators. Bitwise, assignment, conditional operators.

SUGGESTED ACTIVITIES:

- EL Programs using integer type, arithmetic operators and basic input/output.
- EL Programs using other data types and operators.
- Practical Demonstration of programs using integer type, arithmetic operators and basic input/output.
- Practical Demonstration of programs using other data types and operators.

SUGGESTED EVALUATION METHODS:

• Programs on integer type, arithmetic operators, basic input output.

MODULE III:	L	Т	Р	EL
	2	1	4	3

Statements and blocks - Selection - if-else construct - iteration - while - for constructs. The constructs else-if, switch, do-while, break, continue, enum. Pseudocode, Programming style.