

MICRO
LESSON PLAN

Subject : MATHEMATICS-1		
Year : I B-Tech	Semester : I	Branch :EEE
Faculty : S.P.V.N.D SUMALATHA	Reg : R19	Academic Year : 2019-20

COURSE OBJECTIVES:

In this course the students are introduced to some basic tools in Mathematics which are useful in modelling and analyzing physical phenomena involving continuous changes of variables or parameters. The differential and integral calculus of functions of one or more variables and functions of several variables taught in this course have applications across all branches of engineering. This course will also provide basic training in plotting and visualizing graphs of functions and intuitively understanding their properties.

COURSE OUTCOMES:

1	Factual	Ability to understand and explain concepts of convergence and mean value theorems
2	Conceptual	Student's gain knowledge on solving differential equations and its applications to various Engineering fields.
3	Procedural	Ability to apply the basic knowledge of differential equations. Ability to apply the basic knowledge of Linear differential equations in electrical systems
4	Applied	Ability to apply Euler's theorem for multivariable function and to find extreme values. Students are introduced finding areas and volumes using integrals.

TEXT BOOKS/ REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
T	B. S. Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
T	B. V. Ramana, Higher Engineering Mathematics, 2007 Edition, Tata Mc. Graw Hill Education.
R	Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India.
R	Joel Hass, Christopher Heil and Maurice D. Weir, Thomas calculus, 14th Edition, Pearson.
R	Lawrence Turyn, Advanced Engineering Mathematics, CRC Press, 2013.
R	Srimantha Pal, S C Bhunia, Engineering Mathematics, Oxford University Press.

WEB SOURCE REFERENCES: (Detailed Topic link)

W1	www.imperial.ac.uk/workspace/mathematics/Public/pwp/
W2	http://people.sju.edu/~rhall/DiffEq/
W3	www.math.uic.edu/~cslin/m220w07

UNIT – 1: Sequences, Series and Mean value theorems:**[Total Classes : 16]****Activity:**

1	Factual	Reading Prerequisite concepts- Sequence, series and Basic definitions, Videos of Sequence and Series, Referring the content on the Internet
2	Conceptual	Video Lectures related to sequence and series, Mean value theorems. NPTEL Videos Links from the Internet
3	Procedural	Refer to text book content and syntax Other Implementation of Sequence and series with examples(simple to complex)
4	Applied	Solving Exercises, Implementing practice for problem solving Assignments Quiz etc...

Activity / Schedule of UNIT-1 :

Pre-Class : Videos, E-books, Web links etc...

In-Class : Explanation on concept, discussion, Poll, doubts clarification, Demo etc..

Post-Class : Discussion Forum, Review on topic, Assessment, Quiz, Notes etc....

CLASS SL NO	CONCEPT	OBJECTIVES	PRE-CLASS	IN-CLASS	POST-CLASS
1.	Introduction to Sequence and series (revise)	To introduce Basic concepts of Sequence and series	Video Link : https://www.youtube.com/watch?v=cr8pmBLmL8 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
2.	Limit of a sequence	To Understand the concept of Limit of a sequence	Video Link : https://youtu.be/LBSnmanUU2Q Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
3.	Types of sequences – definitions	To Understand the concept of various sequences	Video Link : https://youtu.be/rOmeNK6NqF0 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
4.	Geometric series test – problems	To Understand the concept of	Video Link : https://youtu.be/m7ATbosllvs Text Book : Pdf (e-	Discussion on pre-requisites (5 Min) PPT presentation	Discussion Forum on the topic in the group

		Convergence of geometric series test	book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	(30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Review on the topic Share material on the topic
5.	P-series Test – problems	To Understand the concept of P-series Test	Video Link : https://youtu.be/m7ATbosllvs Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
6.	Comparison Test – problems	To Understand the concept of limit Comparison Test	Video Link : https://youtu.be/YYZmWBYTuhU Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic Exercises to solve
7.	Cauchy's integral test – problems	To Understand the concept of Integral Test	Video Link : https://youtu.be/vxwIEzfweMs Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic Exercises to solve

8.	D-Alembert's ratio test – problems	Able to solve Examples on Alembert's Ratio Test	Video Link : https://youtu.be/LyUj4dk9AoU Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic Exercises to solve
9.	Leibnitz test – problems	To Understand the concept of Leibnitz test	Video Link : https://youtu.be/oG6YoERagXM Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic Quiz
10.	Absolute convergence – problems	To Understand the concept of Absolute convergence	Video Link : https://youtu.be/3_WBVrnO2w8 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
11.	Conditional convergence – problems	To Understand the concept of Conditional convergence	Video Link : https://youtu.be/3J3NBe5kiV0 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic Quiz

12.	Rolle's theorem - problems	To understand the concept of Mean Value Theorem	Video Link : https://youtu.be/_qv5x_O9CaQ https://nptel.ac.in/courses/111/105/111105121/ Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic Assignment - 1
13	Lagranges theorem – problems	To understand the concept of Lagranges theorem	Video Link : https://youtu.be/GvfjkRSUbg https://nptel.ac.in/courses/111/105/111105121/ Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
14	Cauchy's mean value theorem – problems	To understand the concept of Cauchy's mean value theorem	Video Link : https://youtu.be/EfkECElpU1s https://nptel.ac.in/courses/111/105/111105121/ Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic

15	Taylor's series with Remainder terms – problems	To understand the concept of Taylor's series with Remainder terms	Video Link : https://youtu.be/jiEaKY10ATY https://youtu.be/qcUfPb0Fgzg Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/122/104/122104017/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
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16	McLaren's series with Remainder terms – problems	To understand the concept of McLaren's series with Remainder terms	Refer the previous Links of all the concepts in unit-1	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion or Poll activity (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic Assignment-1
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UNIT – 2 : Differential equations of first order and first degree

[Total Classes : 13]

Activity:

1	Factual	Reading Prerequisite concepts- Ordinary Differential Equations and Basic definitions, Videos related to Ordinary Differential Equations, Referring the content on the Internet
2	Conceptual	Video Lectures related to Ordinary Differential Equations NPTEL Videos Links from the Internet
3	Procedural	Refer to text book content and Understanding the Ordinary Differential Equations with examples(simple to complex)
4	Applied	Problems Solving and Applications solving by practice sessions and Assignments Quiz etc...

Activity / Schedule of UNIT-2 :

Pre-Class: Videos, E-books, Web links etc...

In-Class: Explanation on concept, discussion, Poll, doubts clarification, Demo etc..

Post-Class: Discussion Forum, Review on topic, Assessment, Quiz, Notes etc....

CLASS SL NO	CONCEPT	OBJECTIVES	PRE-CLASS	IN-CLASS	POST-CLASS
1.	Introduction on Ordinary differential equations	To introduce The concept of Ordinary differential equations	Video Link : https://youtu.be/ClvFwUpj3ZA Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/108/111108081/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
2.	Introduction to Linear differential equations – problems	To enhance the understanding of The concept of Linear differential equations	Video Link : https://www.youtube.com/watch?v=QC3z-NUkOcE&list=PLociSetSILauNfkJkU0PzbFyBHohCI0rT&index=9 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/108/111108081/	Revise previous class – (5 Mins) Asking Questions on previous class randomly (5 Mins) PPT presentation/class (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
3.	Bernoulli's differential equations – problems	To understand the concept of Bernoulli's differential equations	Video Link : https://www.youtube.com/watch?v=QC3z-NUkOcE&list=PLociSetSILauNfkJkU0PzbFyBHohCI0rT&index=9 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/108/111108081/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation/class (30 min) Doubts clarification	Discussion Forum on the topic in the group Review on the topic Share material on the topic

				(10 min)	
4.	Exact differential equations – problems	To understand the concept of Exact differential equations	Video Link : https://www.youtube.com/watch?v=0CNoNmMdBuE&list=PLociSetSILauNfkJkU0PzbFyBHohCI0rT&index=4 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/108/111108081/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation/class (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
5.	Non-Exact Differential equations Type-I,II	To understand the concept of Non-Exact Differential equations Type-I,II	Video Link : https://www.youtube.com/watch?v=dtbLHto_h_M0&list=PLociSetSILauNfkJkU0PzbFyBHohCI0rT&index=6 https://www.youtube.com/watch?v=Bk9sT1BStlo&list=PLociSetSILauNfkJkU0PzbFyBHohCI0rT&index=8 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/108/111108081/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation/class (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic

6.	Non-Exact Differential equations Type-III,IV,V	To understand the concept of Non-Exact Differential equations Type-III,IV,V	Video Link : https://www.youtube.com/watch?v=SxYI7EzLVDA&list=PLociSetSILauNfkJkU0PzbFyBHohCI0rT&index=7 https://www.youtube.com/watch?v=Bk9sT1BStlo&list=PLociSetSILauNfkJkU0PzbFyBHohCI0rT&index=8 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/108/11110808	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation/class (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
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7.	Newton's law of cooling - problems	To understand the concept of Newton's law of cooling	Video Link : https://www.youtube.com/watch?v=DqFdy6Ad5mg Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/108/111108081/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation/class (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
8.	Natural law of growth – problems	To understand the concept of Natural law of growth	Video Link : https://www.youtube.com/watch?v=tj993BDRAhU Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/108/111108081/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation/class (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
9.	Natural law of decay – problems	To understand the concept of Natural law of decay	Video Link : https://www.youtube.com/watch?v=tj993BDRAhU Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/108/111108081/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation/class (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic

10.	RL & RC circuits - problems	To understand the concept of RL & RC circuits	Video Link : https://www.youtube.com/watch?v=5AFJsTYPVo0 Text Book : Pdf (e-book) CANVAS	Revise previous class – (5 mins) Asking Questions on previous class	Discussion Forum on the topic in the group Review on the
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			INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/108/111108081/	randomely (5 Mins) PPT presentation & demo of cluster configuration (30 min) Doubts clarification (10 min)	topic Share material on the topic configure.
11.	Orthogonal Trajectories – Cartesian form – problems	To understand the concept of Orthogonal Trajectories – Cartesian form	Video Link : https://www.youtube.com/watch?v=NV9nX1a0qoU Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/108/111108081/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation/class (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
12.	Polar form, self orthogonal – problems	To understand the concept of Polar form, self orthogonals	Video Link : https://www.youtube.com/watch?v=YfnIRG4HAKE Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/108/111108081/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic Assignment-2 Quiz - 2

Activity:

1	Factual	Reading Prerequisite concepts- Linear differential equations of higher order Videos Referring the content on the Internet
2	Conceptual	Video Lectures On Linear differential equations of higher order NPTEL Videos Links from the Internet Solved Examples from Internet
3	Procedural	Refer to text book content of Linear differential equations of higher order Understanding the concept with examples(simple to complex)
4	Applied	Problems Solving and Applications solving by practice sessions and Assignments Quiz etc...

Activity / Schedule of UNIT-3:

Pre-Class: Videos, E-books, Web links etc...

In-Class: Explanation on concept, discussion, doubts clarification etc..

Post-Class: Discussion Forum, Review on topic, Assessment, Quiz, Notes etc....

CLASS SL NO	CONCEPT	OBJECTIVES	PRE-CLASS	IN-CLASS	POST-CLASS
1.	Introduction on Higher order linear differential equations	To introduce The concept of Higher order linear differential equations	Video Link : https://www.youtube.com/watch?v=L7Yy0IMshbE Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107098/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
2.	Solution of homogeneous	To introduce The concept	Video Link : https://www.youtube.com/watch?v=A1KyaR	Revise previous class – (5 mins)	Discussion Forum on the topic in the

	linear differential equation	of Solution of homogeneous linear differential equation	jfmnk https://www.youtube.com/watch?v=W4GISFNm2N4 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Pdf : https://hci.stanford.edu/courses/cs448g/a2/files/map_reduce_tutorial.pdf Web Link : https://nptel.ac.in/courses/111/107/111107098/	Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	group Review on the topic Share material on the topic
3.	When $Q(x) = e^{ax}$ or e^{-ax} – problems	To introduce The concept of When $Q(x) = e^{ax}$ or e^{-ax}	Video Link : https://www.youtube.com/watch?v=q2OVz0z6xa4 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Pdf : https://hci.stanford.edu/courses/cs448g/a2/files/map_reduce_tutorial.pdf Web Link : https://nptel.ac.in/courses/111/107/111107098/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
4.	When $Q(x) = \sin(ax + b)$ or $\cos(ax + b)$ – problems	To introduce the concept of When $Q(x) = \sin(ax + b)$ or $\cos(ax + b)$	Video Link : https://www.youtube.com/watch?v=eQ40pAW3z-0 https://www.youtube.com/watch?v=SiJFc1IuWus Text Book : Pdf (e-book) CANVAS INSTRUCTURE Pdf : https://hci.stanford.edu/courses/cs448g/a2/files/map_reduce_tutorial.pdf Web Link : https://nptel.ac.in/courses/111/107/111107098/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic

5.	When $Q(x) = x^n + c -$	To introduce the concept	Video Link : https://www.youtube.com/watch?v=R0qXI6d11Zo	Revise previous class – (5 mins)	Discussion Forum on the topic in the
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	problems	of When $Q(x) = x^n + c$	Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107098/	Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	group Review on the topic Share material on the topic
6.	When $Q(x) = e^{ax} \cdot v(x)$ – problems	To demonstrate Basic When $Q(x) = e^{ax} \cdot v(x)$	Video Link : https://www.youtube.com/watch?v=3LQAaAh4wM8 https://www.youtube.com/watch?v=jRFIrkdnoMQ&list=PLhSp9OSVmeyLTuT8bf-DZlffkRLmXmLzN&index=9 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107098/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
7.	When $Q(x) = x \cdot v(x)$ – problems	To demonstrate Basic When $Q(x) = x \cdot v(x)$	Video Link : https://www.youtube.com/watch?v=NFxs1qqOHuQ https://www.youtube.com/watch?v=jRFIrkdnoMQ&list=PLhSp9OSVmeyLTuT8bf-DZlffkRLmXmLzN&index=9 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107098/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic

8.	When $Q(x) = x^n \cdot v(x)$ – problems	To demonstrate When $Q(x) = x^n \cdot v(x)$	Video Link : https://www.youtube.com/watch?v=NFxs1qqOHsQ https://www.youtube.com/watch?v=jRFIrkdnqMQ&list=PLhSp9QoS_VmeyLTuT8bf-	Revise previous class – (5 mins) Asking Questions on previous class randomly (5	Discussion Forum on the topic in the group Review on the topic
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			DZlffkRLmXmLzN&index=9 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107098/	Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Share material on the topic
9.	Method of variation of parameters – problems	To demonstrate Method of variation of parameters	Video Link : https://www.youtube.com/watch?v=45S-4tR6zCk https://www.youtube.com/watch?v=jiQ2sX5wGwM Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107098/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
10.	LCR-Circuits – problems	<i>To Introduce the concept of LCR-Circuits</i>	Video Link : https://www.youtube.com/watch?v=MfMiqMOu254 https://www.youtube.com/watch?v=MPAk-R16fLY Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107098/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
11.	Simple Harmonic motion - problems	To Introduce the concept of Simple Harmonic motion	Video Link : https://www.youtube.com/watch?v=V9bl02Ffo_o https://www.youtube.com/watch?v=4Jezsfam3w4 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107098/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic

12.	Revision of all the concepts in Unit-3	Revising all the concepts	Refer above Links for data	Revising the concepts discussed so far Any topic to Repeat asked by students.	Assignment-3 Quiz-3

UNIT – 4: Partial differentiation

[Total Classes: 10]

Activity:

1	Factual	Reading Prerequisite concepts- partial differentiation Videos Referring the content on the Internet
2	Conceptual	Video Lectures On partial differentiation NPTEL Videos Links from the Internet Solved Examples from Internet
3	Procedural	Refer to text book content and Examples, Understanding the partial differentiation with examples(simple to complex)
4	Applied	Problems Solving and Applications solving by practice sessions and Assignments Quiz etc...

Activity / Schedule of UNIT-4 :

Pre-Class: Videos, E-books, Web links etc...

In-Class: Explanation on concept, discussion, Poll, doubts clarification etc..

Post-Class: Discussion Forum, Review on topic, Assessment, Quiz, Notes etc....

CLASS SL NO	CONCEPT	OBJECTIVES	PRE-CLASS	IN-CLASS	POST-CLASS
1.	Introduction to partial differentiation	To introduce The concept of the partial differentiation	Video Link : https://www.youtube.com/watch?v=OK88BFOKqQA https://www.youtube.com/watch?v=eTp5wqcSXY Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://www.sanfoundry.com/engineering-mathematics-questions-answers-partial-differentiation-1/ https://nptel.ac.in/courses/111/107/111107108/	Discussion on pre-requisites (5 Min) PPT presentation (30 Min) Discussion (5 min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
2.	Taylor's theorem – problems	To Introduce the concept of Taylor's theorem for functions of several variables	Video Link : https://www.youtube.com/watch?v=oqjgn2XN3Dc Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107108/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic

3.	Mc Lauren's theorem - problems	To Introduce the concept of Mc Lauren's theorem	Video Link : https://www.youtube.com/watch?v=pjv0HtkhifQ Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107108/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
4.	Jacobian, functional dependent and independent	To Introduce the concept of Jacobian, functional dependent and independent	Video Link : https://www.youtube.com/watch?v=xv8WKIrv5WU Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107108/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
5.	Functional relation – problems	To Introduce the concept of Functional relation	Video Link : https://www.youtube.com/watch?v=oP7RgplQ2Fw Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107108/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic

6.	Chain – rule problems	To Introduce the concept of Chain – rule problems	Video Link : https://www.youtube.com/watch?v=Fbsm7Y-lav8 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107108/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
7.	Maxima and Minima (without constraint) - problems	To Introduce the concept of Maxima and Minima (without constraint)	Video Link : https://www.youtube.com/watch?v=N_CyeSqqYs4 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107108/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
8.	Maxima and Minima (with constraint) – problems	To Introduce the concept of Maxima and Minima (with constraint)	Video Link : https://www.youtube.com/watch?v=2bKosTC_YQU Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/107/111107108/	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic

9.	Lagrange method of Undetermined multipliers-problems	To Introduce the concept of Lagrange method of Undetermined multipliers-problems	Video Link : https://www.youtube.com/watch?v=N_CyeSqqYs4 https://www.youtube.com/watch?v=7f7q2jdFbcU Text Book : Pdf (e-book) CANVAS	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
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			INSTRUCTURE Web Link : https://app.writable.com/explore/writable?type=Collection&grades=Elementary&genres=-	Doubts clarification (10 min)	
10.	Euler's Theorem - problems	To Introduce the concept of Euler's Theorem - problems	Video Link : https://www.youtube.com/results?search_query=Euler%E2%80%99s+Theorem+-+problems+engineering+mathematics https://www.youtube.com/watch?v=BzYrhvmIP34 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://app.writable.com/explore/writable?type=Collection&grades=Elementary&genres=-	Revise previous class – (5 mins) Asking Questions on previous class randomly (5 Mins) PPT presentation & demo (30 min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic Assignment-4 Quiz – 4

Activity:

1	Factual	Reading Prerequisite concepts- line integral, Double integral Videos Referring the content on the Internet
2	Conceptual	Video Lectures On line integral, Double integral, Triple integral Videos and NPTEL Videos Links from the Internet Solved Problems, Examples from Internet
3	Procedural	Refer to text book content and Examples, Understanding the multiple integrals with examples(simple to complex)
4	Applied	Problems Solving and Applications solving by practice sessions and Assignments Quiz etc...

Activity / Schedule of UNIT- 5:

Pre-Class: Videos, E-books, Web links etc...

In-Class: Explanation on concept, discussion, Poll, doubts clarification etc..

Post-Class: Discussion Forum, Review on topic, Assessment, Quiz, Notes etc....

CLASS SL NO	CONCEPT	OBJECTIVES	PRE-CLASS	IN-CLASS	POST-CLASS
1.	Introduction to line,surface,volume integrals	To introduce The concept of line,surface, volume integrals	Video Link : https://www.youtube.com/watch?v=NyG0vRn5EfU https://www.youtube.com/watch?v=JiQW1TQ5MMs https://www.youtube.com/watch?v=hG7h2g36jrQ Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/104/111104085/	Discussion on pre-requisites (10 Min) PPT presentation/Classes/demo (35 Min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
2.	Evaluation of Double integrals – problems	To introduce The concept of Double integrals	Video Link : https://www.youtube.com/watch?v=XX5-ZgFC85E https://www.youtube.com/watch?v=aqu6v4vdfd4 Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/104/111104085/	Discussion on pre-requisites (10 Min) PPT presentation/Classes/demo (35 Min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
3.	Change the order of integration – problems	To introduce The concept of Change the order of integration	Video Link : https://www.youtube.com/watch?v=ObkiHZfGdZU https://www.youtube.com/channel/UCFp0mDTHxb4kmzYEI7idxQQ Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link :	Discussion on pre-requisites (10 Min) PPT presentation/Classes/demo (35 Min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic

			https://nptel.ac.in/cour		
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			ses/111/104/111104085/		
4.	Changing in to polar co-ordinates – problems	To introduce The concept of Changing in to polar co-ordinates	Video Link : https://www.youtube.com/watch?v=oPLMH4q3kNk https://www.youtube.com/watch?v=TKM3ME2m7vU Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/104/111104085/	Discussion on pre-requisites (10 Min) PPT presentation/Class/demo (35 Min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
5.	Changing of variables – problems	To introduce The concept of Changing of variables	Video Link : https://www.youtube.com/watch?v=1Molt6vC0gU https://www.youtube.com/watch?v=3hyciaX4cSQ Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/104/111104085/	Discussion on pre-requisites (10 Min) PPT presentation/Class/demo (35 Min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic

6.	Volume integrals – Evaluation	To introduce The concept of Evaluating Volume integrals	Video Link : https://www.youtube.com/watch?v=hG7h2g36jrQ https://www.youtube.com/watch?v=g89jZhB1X3s Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/104/111104085/	Discussion on pre-requisites (10 Min) PPT presentation/Class/demo (35 Min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
7.	Mass of triple integrals – problems	To introduce The concept of Evaluating Mass of triple integrals	Video Link : https://www.youtube.com/watch?v=yqstdcWdHDs https://www.youtube.com/watch?v=Fm63pdzB1lo Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/104/111104085/	Discussion on pre-requisites (10 Min) PPT presentation/Class/demo (35 Min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
8.	Mass of triple integrals – problems	To introduce The concept of Checking out the Pig Script Interfaces	Video Link : https://www.youtube.com/watch?v=yqstdcWdHDs https://www.youtube.com/watch?v=Fm63pdzB1lo Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/104/111104085/	Discussion on pre-requisites (10 Min) PPT presentation/Class/demo (35 Min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic

9.	Volume of cylindrical co-ordinates – problems	To introduce The concept of Volume of cylindrical co-ordinates	Video Link : https://www.youtube.com/watch?v=cghy5cEoCNg https://www.youtube.com/watch?v=vjYPfdKPJJM Text Book : Pdf (e-book) CANVAS INSTRUCTURE Web Link : https://nptel.ac.in/courses/111/104/111104085/	Discussion on pre-requisites (10 Min) PPT presentation/Classes/demo (35 Min) Summary (5min) Doubts clarification (10 min)	Discussion Forum on the topic in the group Review on the topic Share material on the topic
10.	Revision of all the concepts in Unit-5	Revising all the concepts	Refer above Links for data	Revising the concepts discussed so far Any topic to Repeat asked by students.	Assignment-5 Quiz-5

TOTAL CLASSES: 60

**Prepared by
Faculty Signature**

**Approved by
HOD**

(B.RAVI SHANKAR)