

Dr. BRR. Govt. Degree College, Jadcherla.

Department of Mathematics

5

2022-23

## PERMISSION LETTER

Date: 23/03/2023

Jadcherla.

To

The Principal,

Dr. BRR. Govt. Degree College,

Jadcherla.

Madam,

Sub: Introduction of Add-on

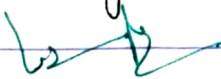
Course on

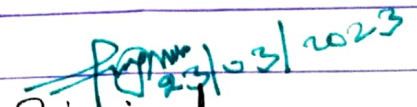
Permission - Reg - Reg.

Adverting to the subject cited above Department of Mathematics is going to launch a Add-on- Course on "Vector Calculus". I request you kindly permit me.

Thanking you madam.

Incharge



  
Principal  
**PRINCIPAL**

Dr. B.R.R. Government Degree College  
Jadcherla

Dr. B.R.R. Govt. Degree College, Jadcherla  
Department of Mathematics

2022-23

## NOTICE

Date: 24/03/2023

It is hereby informed to all B.Sc. (MPC, MPCs & MECS) III year students that the Department of Mathematics is going to organise add-on-course from 28/03/2023 to 1/4/2023 on topic: Vector Calculus.

Interested students can register their names at the Department of Mathematics on or before 27/03/2023

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End

2022-23

Add-on-Course  
on  
VECTOR CALCULUS

INTRODUCTION

Vector Calculus also known as vector analysis, deals with the differentiation and Integration of vector field, especially in the three-dimensional Euclidean space.

The term "vector calculus" is sometimes used as a synonym for the broader subject of multivariable calculus.

Vector calculus deals with two integrals such as line integrals and surface integrals.

In vector calculus, a line integral of a vector field is defined as an integral of some function along a curve.

A surface integral is defined as a generalisation of several integrals to the integrations over surfaces.

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2022-23

Add-on-Course  
on

## AIMS AND OBJECTIVES

vector Calculus plays an important role in differential geometry and in the study of Partial Differential Equations.

It is used extensively in Physics and Engineering, especially in the description of electromagnetic fields, gravitational fields and fluid flow.

The objective of this course is to familiarize the prospective engineers with some advanced concepts and methods in Mathematics which include the Calculus of vector valued functions, Ordinary Differential Equations and Laplace & Fourier Transforms which are invaluable for any engineers.

Concepts like gradient, divergence, curl.

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Add-on - Course  
on

## SYLLABUS

### UNIT-I

Line Integrals:

Introductory Examples - Work done against a Force - Evaluation of Line Integrals, Conservative vector Fields.

Surface Integrals:


Introductory Examples - Flow Through a pipe - Evaluation of Surface Integrals.

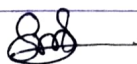
### UNIT-II


Volume Integrals: Evaluation of Volume Integrals

Gradient, Divergence and Curl:

Partial Differentiation and Taylor Series - Partial Differentiation Taylor series in more than one variable - Gradient of a scalar field - Gradients, Conservative fields and Potentials - Physical applications of the Gradient.

  
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## OUTCOMES

The student is able to apply techniques from multivariable analysis to set up and solve mathematical models, to deduce simple mathematical results and to calculate integrals.

Students realize the way calculus is used to address some of the problems of physics.

  
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## QUESTION PAPER

1. Evaluate the line integral of  $F = (y, x, z)$  around the closed curve given by  $x = \cos \theta$ ,  $y = \sin \theta$ ,  $z = 0$ ,  $0 \leq \theta \leq 2\pi$ .
2. Evaluate the line integral of the vector field  $u = (xy, z^2, x)$  along curve given by  $x = 1+t$ ,  $y = 0$ ,  $z = t^2$ ,  $0 \leq t \leq 3$ .
3. Find the surface integral of  $u \cdot n$  over  $S$  where  $S$  is the parts of surface  $z = x + y^2$  with  $z < 0$  and  $x > -1$ ,  $u$  is the vector field  $u = (2y + x, -1, 0)$  and  $n$  has negative  $z$  component.
4. What is the total mass of the object?  
Define volume integral?
5. Find the volume of the tetrahedron with vertices at  $(0, 0, 0)$ ,  $(a, 0, 0)$ ,  $(0, b, 0)$ ,  $(0, 0, c)$ .

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S.No	H.T NO	Name of the student	class(mpr)	28/03/23	29/03/23	31/03/23	01/04/23	02/04/23	06/04/23
1	2003-3006-441-001	A. shireesha	MPC III <sub>A</sub>	A. shireesha Pavan	A. shireesha Pavan	A. shireesha Pavan	A. shireesha Pavan	A. shireesha Pavan	A. shireesha Pavan
2	2003-3006-441-003	B. pavan	"	B. madhavi	B. madhavi	B. madhavi	B. madhavi	B. madhavi	B. madhavi
3	2003-3006-441-005	B. madhavi	"	Nandini	Nandini	AB	Nandini	Nandini	Nandini
4	2003-3006-441-007	B. Nandini	"	Prof	Prof	Prof	Prof	Prof	Prof
5	2003-3006-441-008	C. Rajeshwar	"	Naresh	Naresh	Naresh	AB	Naresh	Naresh
6	2003-3006-441-009	C. Naresh	"	C. sangeetha	C. sangeetha	C. geetha	geetha	geetha	geetha
7	2003-3006-441-010	C. sangeetha	"	AB	E. Nagalaxmi	E. nagalaxmi	AB	E. Nagalaxmi	E. nagalaxmi
8	2003-3006-441-012	E. Nagalaxmi	"	AB	G. Anusha	G. Anusha	G. Anusha	G. Anusha	G. Anusha
9	2003-3006-441-013	G. Anusha	"	Suri	Suri	Suri	Suri	AB	Suri
10	2003-3006-441-015	G. Suresh	"	G. Manasa	G. Manasa	G. Manasa	G. manasa	G. manasa	G. manasa
11	2003-3006-441-016	G. manasa	"	J. Sowmya	AB	J. Sowmya	J. Sowmya	J. Sowmya	J. Sowmya
12	2003-3006-441-019	J. Sowmya	"	K. Girija	K. Girija	K. Girija	AB	K. Girija	K. Girija
13	2003-3006-441-026	K. Girija	"	Ay	Ay	AP	Ay	Ay	Ay
14	2003-3006-441-027	K. Archana	"	M. Shivalingam	M. Shivalingam	M. Shivalingam	M. Shivalingam	M. Shivalingam	AB
15	2003-3006-441-034	M. Shivalingam	"	N. Mahesh	AB	N. Mahesh	N. Mahesh	N. Mahesh	N. Mahesh
16	2003-3006-441-041	N. Mahesh	"	Shireesha	Shireesha	Shireesha	Shireesha	AB	Shireesha
17	2003-3006-441-044	P. shireesha	"	chait	chait	chait	chait	chait	chait
18	2003-3006-441-045	P. Chaitanya	"	Pp	Pp	Pp	Pp	Pp	Pp
19	2003-3006-441-048	P. shireesha	"	R. Aravind	R. Aravind	R. Aravind	R. Aravind	R. Aravind	R. Aravind
20	2003-3006-441-050	R. Aravind	"	sandhya	sandhya	sandhya	sandhya	sandhya	sandhya
21	2003-3006-441-053	S. Sandhya	"	Maheshwari	Maheshwari	Maheshwari	Maheshwari	Maheshwari	Maheshwari
22	2003-3006-441-056	T. maheshwari	"	AB	AB	AB	AB	AB	AB
23	2003-3006-441-059	Y. Anusha	"	Kalyani	Kalyani	Kalyani	Kalyani	Kalyani	Kalyani
24	20033252441005	C. Kalyani	"				AB		

MPCS III<sub>B</sub>

S.No	H.T NO	Name of the student	class(mpr)	28/03/23	29/03/23	31/03/23	01/04/23	02/04/23	06/04/23
25	2003-3006-468-003	Ayesha	"	Ayesha	AB	Ayesha	Ayesha	Ayesha	Ayesha
26	2003-3006-468-004	B. mallesh	"	Mey	Mey	Mey	AB	Mey	Mey
27	2003-3006-468-006	B. Gopichand.	"	B. Gopichand	B. Gopichand	AB	B. Gopichand	B. Gopichand	B. Gopichand
28	2003-3006-468-015	J. madhukumar	"	Mj	Mj	Mj	AB	Mj	Mj
29	2003-3006-468-018	K. Shiva	"	S	S	S	AB	S	S
30	2003-3006-468-019	K. Karunakar	"	K. Karunakar	K. Karunakar	AB	K. Karunakar	K. Karunakar	AB
31	2003-3006-468-028	M. Deepika	"	AB	AB	AB	M. Deepika	AB	AB

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# DR.BRR GOVERNMENT DEGREE COLLEGE, JADCHERLA

Accredited by NAAC with "B" Grade  
Mahabubnagar (Dist), Telangana-509301  
Affiliated to Pabamuru University



## Add-on Course on "Vector Calculus" Department of Mathematics

### CERTIFICATE

This is to certify \_\_\_\_\_, Class: \_\_\_\_\_  
MPC/MPCS/MECS III Yr, H.T.No: \_\_\_\_\_ has Successfully Completed  
**Add -On Course on "VECTOR CALCULUS"** organised by **Department of Mathematics**, Dr.BRR  
Government Degree College, Jadcherla, Mahabubnagar (Dist), Telangana State held from 28-03-2023  
to 11-05-2023.

S.Madhavi Latha

Lecturer in Mathematics

B.Uday Kumar

Assistant Professor  
I/C Department

Dr.Ch.Appiya Chinnamma

Principal