SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF MATHEMATICS

MINUTES OF BOARD OF STUDIES 6th MEETING

Venue

Department of Mathematics

School of Arts and Science (Block)

Sri Manakula Vinayagar Engineering College

Date & Time

22.11.2023 & 10.00 am to 12.30 pm

DEPARTMENT OF MATHEMATICS

Minutes of Board of Studies 6th Meeting

The Board of Studies 6th meeting was held on 22.11.2023 (Wednesday) at 10.15 A.M in the Department of Mathematics, Sri Manakula Vinayagar Engineering College, with Head of the Department in the Chair.

The following members were present for the BoS meeting

Sl.No	Name of the Member with Designation and official Address	Members as per UGC norms
1	Dr. T. Gayathri M.Sc., M.Phil., Ph.D. Professor and Head Department of Mathematics Sri Manakula Vinayagar Engineering College Puducherry– 605107 gayathrithiyagu@smvec.ac.in/ 9486580058	Chairman
2	Dr. S. Tamilselvan M.Sc., M.Phil., Ph.D. Professor & Head Department of Mathematics Annamalai University, Chidambaram- 608 002 stamilselvan@hotmail.com/9443073937	Subject Expert (University Nominee)
3	Dr. P. Balaji M.Sc., M.Phil., Ph.D. Assistant Professor (Stage II) Department of Mathematics SCSVMV university, Kanchipuram-631561 pbr1002017@gmail.com/9486082115	Subject Expert (Academic Council Nominee)
4	Dr. S. Srinivasan M.Sc., M.Phil., Ph.D. Assistant Professor Department of Mathematics Periyar Government Arts and Science College, Cuddalore -607003 smrail@gmail.com/7010939424	Subject Expert (Academic Council Nominee)
5	Mr. G. Indragoby Associate Director Sensipe Software Solutions(p)Ltd Chennai indragoby@gmail.com/98432223234	Member (Representative from Industry)
6	Mr.P.Krishnamoorthy M.Sc., M.Phil. Assistant Professor Department of Mathematics Sri ManakulaVinayagar Engineering College Puducherry– 605107 krishnamoorthymaths@smvec.ac.in /9750028056	Internal Member

7	Dr.B.Kanimozhi M.Sc., M.Phil.,Ph.D. Professor Department of Mathematics Sri ManakulaVinayagar Engineering College Puducherry– 605107 kanimozhimaths@smvec.ac.in /7708824215	Internal Member
8	Mr. R. Sivakumar M.Sc., M.Phil. Assistant Professor Department of Mathematics Sri ManakulaVinayagar Engineering College Puducherry– 605107 sivakumarmaths.sas@smvec.ac.in /8667646837	Internal Member
9	Mr. D. Gnanavel M.Sc., M.Phil. Assistant Professor Department of Mathematics Sri ManakulaVinayagar Engineering College Puducherry– 605107 gnanavel.sas@smvec.ac.in/9629123962	Internal Member
10	Mrs.S.P.Lavanya M.Sc., M.Phil. Assistant Professor Department of Mathematics Sri ManakulaVinayagar Engineering College Puducherry– 605107 lavanya@smvec.ac.in /9655887720	Internal Member
11	Mrs. S Geetha M.Sc., M.Phil. Assistant Professor Department of Physics Sri ManakulaVinayagar Engineering College Puducherry– 605107 geethaphysics@smvec.ac.in /9942355656	Internal Member
12	Dr. K. Karthikeyan M.Sc., M.Phil., Ph.D. Associate Professor Department of Chemistry Sri ManakulaVinayagar Engineering College Puducherry– 605107 karthikeyank2005@gmail.com /9344707262	Internal Member
13	Mr.M.ElamaranM.A., M.Phil. Assistant Professor Department of English Sri ManakulaVinayagar Engineering College Puducherry - 605107 elamaraneng@smvec.ac.in/ 9500712597	Internal Member

AGENDA OF THE MEETING

Item No.: BoS/2023/SAS/UG/MATHEMATICS/ 6 .1

Welcome address, Introduction about the Institution, Department and BoS Members.

Item No.: BoS/2023/SAS/UG/MATHEMATICS/ 6.2

To review and confirm the minutes of the 5th BoS meeting held on February 22,2023.

Item No.: BoS/2023/SAS/UG/MATHEMATICS/ 6.3

To discuss and approve the curriculum (I – VI semester) and syllabi (II semester) for B.Sc. Mathematics programme under Regulations R- 2023

Item No.: BoS/2023/SAS/UG/MATHEMATICS/ 6.4

To discuss and approve the Academic calendar for the even Semesters (semester II, IV & VI) of Academic year 2023-24.

Item No.: BoS/2023/SAS/UG/MATHEMATICS/ 6.5

To appraise and approve the Employability Enhancement Course (EEC) courses and Skill Enrichment Courses (SEC) offered to II semester (R2023)

Item No.: BoS/2023/SAS/UG/ MATHEMATICS / 6.6

To deliberate about the NPTEL / MOOC online certification courses and its outcome (to be approved by board of studies) for the students admitted from the academic year 2023-2024 under Regulations R 2023.

Item No.: BoS/2023/SAS/UG/ MATHEMATICS / 6.7

To propound the department research activities (Publications, patents, funds) and its outcome.

To inform about the remarkable achievements of staff and students

Item No.: BoS/2023/SAS/UG/ MATHEMATICS / 6.8

To discuss and get information regarding the admission strategies, Internship trainings and placements from the BOS experts.

Item No.: BoS/2023/SAS/UG/ MATHEMATICS / 6.9

Any other item with the permission of the chair.

MINUTES OF THE MEETING

Item No.: BoS/2023/SAS/ UG / B.Sc. Mathematics 6.1

Welcome address, Introduction about the Institution, Department and BoS Members.

- The Chairman of the meeting formally welcomed the hon'ble members of the Board and introduced them the credentials of the Institution and of the Department.

Item No.: BoS/2023/SAS/ UG / B.Sc. Mathematics 6.2

To review and confirm the minutes of the 5th BoS meeting held on February 22,2023.

Suggestions were given by BoS members for the I semester courses in the 5th BoS meeting.

S.No	Regulation	Semester	Course Title/ Course Code	Unit	Particulars
1	R2023	I	CALCULUS **A23MAT101D**	II	Suggested to Rename as Differential Calculus(Cont)
2	R2023	I	CALCULUS **A23MAT101D**	IV	Suggested to give the reduction formula for Specific Functions only

These suggestions were incorporated in the syllabi and approved by the expert members and Recommended to Academic Council.

[Details are Attached in **Annexure I**]

Item No.: BoS/ UG / B.Sc Mathematics 6.3

To discuss and approve the curriculum (I – VI semester) and syllabi (II semester) for B.Sc. Mathematics programme under Regulations R- 2023

- The Regulations 2023 presented before the BOS members.
- The board members approved the Regulation 2023 for B.Sc. Mathematics programme and forwarded to Academic council.

The Syllabus for Second Semester Courses for B.Sc. Mathematics under Regulations 2023 presented before the BOS members. The following suggestions were given by BoS members.

S.No	Regulation	Semester	Course Title/ Course Code	Unit	Particulars
1	R2023	II	VECTOR CALCULUS **A23MAT203D**	V	Suggested to shift Stoke's Theorem into Unit IV
1	R2023	II	VECTOR CALCULUS **A23MAT203D**	IV	Suggested to shift Volume of integral into Unit V
2	R2023	II	ORDINARY DIFFERENTIAL EQUATIONS **A23MAT204D**	IV	Suggested to shift Solving Homogeneous linear equations (Cauchy- Euler Equations) into Unit V

These suggestions were incorporated in the syllabi and approved by the expert members and Recommended to Academic Council.

[Details are Attached in **Annexure II**]

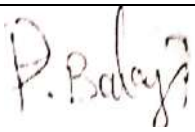
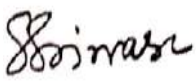
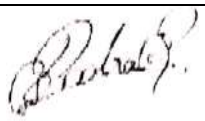
Item No.: BoS/

To discuss and approve the Academic calendar for the even Semesters (semester II, IV

UG / B.Sc Mathematics 6.4	**& VI) of Academic year 2023-24.** ❖ Conduct of Continuous assessment test, Model Exam, Model practical exams, award of internal assessment /Re Earn / Improvement Exam / Evaluation Procedures. ❖ Discussed about Question paper pattern for Continuous Assessment test, Model Examination and End Semester Examination. ❖ Discussed about dates of Continuous Assessment test, Model Examination, QCM Report Submission, Course committee meeting, Class committee meeting, Mark list submission and Holidays. ❖ Discussed about Distribution of Attendance Marks, Assignment mark and test mark.
Item No.: BoS/ UG / B.Sc Mathematics 6.5	**To appraise and approve the Employability Enhancement Course (EEC) courses and Skill Enrichment Courses (SEC) offered to II semester (R2023)** ❖ The Institute has Established 17 Centers of Excellence to provide 95 International Certification courses from IBM, Google, Cisco, E Plan, Microsoft, Autodesk, Texas instruments, Festo, Bentley, Schneider Electric, Amazon web services, Siemens, Tally, DELL EMC², Harita Techserv, PTC, LN an Excellence in Technology & Didactic solutions. ❖ We offer this course to the students for the first four semesters. ❖ Students can choose any one course out of 95 certificate courses for each semester (I to IV semester)
Item No.: BoS/ UG / B.Sc Mathematics 6.6	**To deliberate about the NPTEL / MOOC online certification courses and its outcome (to be approved by board of studies) for the students admitted from the academic year 2023-2024 under Regulations R 2023.** ❖ NPTEL / MOOC online certification course will be conduct during 5th semester.
Item No.: BoS/ UG / B.Sc Mathematics 6.7	**To propound the department research activities (Publications, patents, funds) and its outcome.** **To inform about the remarkable achievements of staff and students.** ❖ Board members appreciated the activities conducted by the department of Mathematics.
Item No : BoS/ UG / B.Sc Mathematics 6.8	**To discuss and get information regarding the admission strategies, Internship trainings and placements from the BOS experts.** Discussed about the necessary action to be taken for the admission for the B.Sc., Mathematics Programme and also discuss the following items. • Admission Eligibility Criteria: Pass in +2/HSC (or equivalent) with "Mathematics" as one of the subjects • Suggested to highlight about the importance of mathematics and employment opportunities in future. The BOS members suggested to start the program even though the number of admissions is minimum, in future we can gradually increase the admissions.
Item No : BoS/ UG / B.Sc Mathematics	Any other agenda – Nil

6.9	

The meeting was concluded at 10:00 PM with vote of thanks by **Dr. T. Gayathri**, Chairman, Board of Studies, Department of Mathematics, Sri Manakula Vinayagar Engineering College.

Sl.No	Name of the Member with Designation and official Address	Members as per UGC norms	Signature
1	Dr. T. Gayathri M.Sc., M.Phil., Ph.D. Professor and Head Department of Mathematics Sri Manakula Vinayagar Engineering College Puducherry– 605107 gayathrithiyagu@smvec.ac.in/ 9486580058	Chairman	
2	Dr. S. Tamilselvan M.Sc., M.Phil., Ph.D. Professor & Head Department of Mathematics Annamalai University, Chidambaram- 608 002 stamilselvan@hotmail.com/9443073937	Subject Expert (University Nominee)	
3	Dr. P. Balaji M.Sc., M.Phil., Ph.D. Assistant Professor (Stage II) Department of Mathematics SCSVMV university, Kanchipuram-631561 pbr1002017@gmail.com/9486082115	Subject Expert (Academic Council Nominee)	
4	Dr. S. Srinivasan M.Sc., M.Phil., Ph.D. Assistant Professor Department of Mathematics Periyar Government Arts and Science College, Cuddalore -607003 smrail@gmail.com/7010939424	Subject Expert (Academic Council Nominee)	
5	Mr. G. Indragoby Senior Technical Architect HCL Technologies, Chennai indragoby@gmail.com/98432223234	Member (Representative from Industry)	
6	Mr.P.Krishnamoorthy M.Sc., M.Phil. Assistant Professor Department of Mathematics Sri ManakulaVinayagar Engineering College Puducherry– 605107 krishnamoorthymaths@smvec.ac.in /9750028056	Internal Member	
7	Dr.B.Kanimozhi M.Sc., M.Phil.,Ph.D. Professor Department of Mathematics Sri ManakulaVinayagar Engineering College Puducherry– 605107 kanimozhimaths@smvec.ac.in /7708824215	Internal Member	
8	Mr. R. Sivakumar M.Sc., M.Phil. Assistant Professor	Internal Member	

	Department of Mathematics Sri ManakulaVinayagar Engineering College Puducherry– 605107 sivakumarmaths.sas@smvec.ac.in /8667646837		
9	Mr. D. Gnanavel M.Sc., M.Phil. Assistant Professor Department of Mathematics Sri ManakulaVinayagar Engineering College Puducherry– 605107 gnanavel.sas@smvec.ac.in/9629123962	Internal Member	
10	Mrs.S.P.Lavanya M.Sc., M.Phil. Assistant Professor Department of Mathematics Sri ManakulaVinayagar Engineering College Puducherry– 605107 lavanya@smvec.ac.in /9655887720	Internal Member	
11	Mrs. S Geetha M.Sc., M.Phil. Assistant Professor Department of Physics Sri ManakulaVinayagar Engineering College Puducherry– 605107 geethaphysics@smvec.ac.in /9942355656	Internal Member	
12	Dr. K. Karthikeyan M.Sc., M.Phil., Ph.D. Associate Professor Department of Chemistry Sri ManakulaVinayagar Engineering College Puducherry– 605107 karthikeyank2005@gmail.com /9344707262	Internal Member	
13	Mr.M.ElamaranM.A., M.Phil. Assistant Professor Department of English Sri ManakulaVinayagar Engineering College Puducherry - 605107 elamaraneng@smvec.ac.in/ 9500712597	Internal Member	

ANNEXURE I

Department	**MATHEMATICS**			Programme: **B.Sc. (Mathematics)**				
Semester	**First**			Course Category Code: **DSC** *End Semester Exam Type: **TE**				
Course Code	**A23MAT101D**			Periods / Week			Credit	Maximum Marks
				L	T	P	C	CAM / ESE / TM
Course Name	**CALCULUS**			**3**	**1**	**0**	**4**	**25 / 75 / 100**

Prerequisite	Mathematics should be a subject in +2.		
Course Objectives	To understand the concept of Maxima and minima of function of two and three variables.		
	To gain the knowledge of curvature and Radius of curvature.		
	To understand the concept of Envelope, Evolute and Asymptotes.		
	To introduce the Reduction formula.		
	To introduce change of order of integration.		
Course Outcome	**On completion of the course, the students will be able to**		BT Mapping (Highest Level)
	CO1	Find maxima and minima for the functions.	**K2**
	CO2	Understand the curvature and Radius of curvature.	**K2**
	CO3	Find asymptotes of rational algebraic curves.	**K3**
	CO4	Solve the Beta and Gamma functions.	**K3**
	CO5	Solve Area and Volume problems.	**K3**

UNIT-I	**DIFFERENTIAL CALCULUS**	**Periods: 12**	
Jacobians – Derivative of implicit function using differentials, composite functions - Total differential – maxima and minima functions of 2 and 3 independent variable, Lagrange's method [without proof].			**CO1**
UNIT-II	**DIFFERENTIAL CALCULUS[Contd]**	**Periods: 12**	
Curvature, Radius of Curvature in Cartesian and Polar coordinates, p-r equation.			**CO2**
UNIT-III	**DIFFERENTIAL CALCULUS[Contd]**	**Periods: 12**	
Evolutes, Envelope, Asymptotes: Methods [without proof] of finding asymptotes of rational algebraic curves with special cases.			**CO3**
UNIT-IV	**INTEGRAL CALCULUS**	**Periods: 12**	
Reduction formulae: $x^n e^{ax}$, $sin^n x$, $cos^n x$, $sin^m x cos^n x$ and $x^m (log x)^n$ - Beta, Gamma Functions and their Properties.			**CO4**
UNIT-V	**INTEGRAL CALCULUS[Contd]**	**Periods: 12**	
Change of order of Integration – Applications to Area, Surface Area and Volume.			**CO5**

Lecture Periods: 45	**Tutorial Periods: 15**	**Practical Periods: -**	**Total Periods: 60**

Text Books

1. T. K. Manicavachagom Pillai, "Calculus Volume – I", Printers and Publishers, 1992.
2. S. Narayanan and T. K. Manicavachagom Pillai, "Calculus Volume I", S.Viswanathan Printers Publishers Pvt Limited, 2011.
3. P. Kandasamy, K. Thilagavathy, "Mathematics for B.Sc", Vol - I &II", S.Chand & Company Ltd., New Delhi, 2004.

Reference Books

1. S. Arumugam and Isaac, "Calculus, Volume I", New Gamma Publishing House,1991.
2. G. B. Thomas and R. L. Finney, "Calculus and Analytic Geometry",Addison Wesley, 9th Edition, 1995.
3. P. R. Vittal, "Calculus", Margham Publication, 2004.

4. Shanti Narayan (2001) Differential Calculus. Shyamlal Charitable Trust, New Delhi.

5. Shanti Narayan (2001) Integral Calculus.S.Chand& Co. New Delhi.

Web References

1. https://youtu.be/Cn54abNI2TI
2. https://youtu.be/Em5EUstK8Rw
3. https://www.sakshieducation.com/Engg/EnggAcademia/CommonSubjects/M1-Curvature Evolutes& Envelopes CurveTracing.pdf
4. https://theengineeringmaths.com/wp-content/uploads/2021/02/beta-gamma-functions-converted.pdf
5. http://archive.nitjsr.ac.in/course_assignment/MTH26MA1202Math%20-%20II%20[1a%20Multiple%20Integrals-%20theories%20from%20B.S.%20Grewal].pdf

* TE – Theory Exam, LE – Lab Exam

COs/POs/PSOs Mapping

Cos	Program Outcomes (POs)					Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
1	3	2	3	2	3	2	3	1
2	3	2	3	2	1	3	2	1
3	3	2	3	3	3	2	3	1
4	2	3	2	3	3	3	2	2
5	3	2	3	3	1	3	2	1

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Method

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	10		5	5	5	75	100

* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

ANNEXURE II

Department	**MATHEMATICS**			Programme: **B.Sc. (Mathematics)**				
Semester	**Second**			Course Category Code: **DSC** *End Semester Exam Type: **TE**				
Course Code	**A23MAT203D**			Periods / Week			Credit	Maximum Marks
				L	T	P	C	CAM / ESE / TM
Course Name	**VECTOR CALCULUS**			**3**	**1**	**0**	**4**	**25 / 75 / 100**
Prerequisite	Mathematics should be a subject in +2.							
Course Objectives	To enable students to Understand the fundamental concepts of vector calculus							
	To enable the students to learn the concepts of differentiation of vectors.							
	To find solutions of Solenoidal and Irrotational.							
	To know about the line integral.							
	To bring the knowledge of vector calculus and its application in theorems							
Course Outcome	**On completion of the course, the students will be able to**							BT Mapping (Highest Level)
	CO1	Understand the concept of Direction cosines and direction ratios						**K2**
	CO2	Gain logical skills in the formulation of differential equations						**K3**
	CO3	Compute divergence and curl of vectors.						**K3**
	CO4	Apply the various techniques of vector integration in solving Line and surface integrals.						**K3**
	CO5	Understand the concept of Gauss Divergence Theorem and Green's Theorem						**K3**
UNIT-I	**INTRODUCTION**						**Periods: 12**	
Introduction – Scalars and vectors – Representation of a vector and types of vectors – Algebra of vectors – Position vectors – Resolution of vectors – Direction cosines and direction ratios – Limit of a vector function – Continuity and derivative of vector function.								**CO1**
UNIT-II	**DIFFENENTIAL VECTOR CALCULUS**						**Periods: 12**	
Differentiation of a vector – Geometrical Interpretation of the Derivative – Differentiation formulae – Differentiation of dot and cross Products – Partial Derivatives of Vectors – Differentials of Vectors.								**CO2**
UNIT-III	**GRADIENT, DIVERGENCE AND CURL**						**Periods: 12**	
Vector Differential Operator Del - Gradient of a Scalar Function - Directional Derivative - Geometric Interpretation - Gradient of the sum of Functions; of the product of functions and of a function of function - Operations involving Del - Divergence of a Vector and its Physical Interpretation - Curl of a Vector and its Physical Interpretation - Expansion Formulae for Operators involving Del - Solenoidal and Irrotational.								**CO3**
UNIT-IV	**VECTOR INTEGRATION**						**Periods: 12**	
The Line Integral - Surface Integral and its Physical Meaning – Stoke's Theorem								**CO4**
UNIT-V	**VECTOR INTEGRATION(CONTD.)**						**Periods: 12**	
Green's Theorem, Gauss Divergence Theorem and Volume of integral - Simple problem								**CO5**
Lecture Periods: 45	**Tutorial Periods: 15**		**Practical Periods: -**				**Total Periods: 60**	
Text Books								

1. M.D. Raisinghania and others. S. Chand & Co,Ltd., Ram Nagar New Delhi 110055, Vector Algebra, 1999.
2. Duraipandian, P., LaxmiDuraipandian, Vector Calculus, Emerald Publishers, 2003.
3. Shanti Narayan, P. K. Mittal, A Text Book of Vector Analysis (English) 19th Edition, S.Chand Publishers, 2013.

Reference Books

1. P.R.Vittal. (2004) Vector Calculus, Fourier series and Fourier Transform. Margham Publications, Chennai.
2. G.B.Thomas and R.L.Finney. (1998) Calculus and Analytic Geometry, Addison Wesley (9th Edn), Mass. (Indian Print).
3. M.K.Venkataraman. (1992) Engineering Mathematics-Part B. National Publishing Company, Chennai.
4. B.S.Grewal. Higher Engineering Mathematics (2002), Khanna Publishers, New Delhi

Web References

1. https://www.lehman.edu/faculty/anchordoqui/VC-3.pdf
2. https://www.rcet.org.in/uploads/files/LectureNotes/cse/S2/Mathematics%20-%20II%20Notes/Unit-2%20Vector%20Calculus.pdf
3. **https://www.snggdcg.ac.in/pdf/study-material/mathematics/SMch18.pdf**

* TE – Theory Exam, LE – Lab Exam

COs/POs/PSOs Mapping

Cos	Program Outcomes (POs)					Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
1	2	2	3	2	3	2	3	1
2	3	2	3	3	1	3	3	1
3	3	2	2	3	3	2	3	1
4	2	3	2	3	3	2	2	2
5	3	2	3	3	1	3	2	1

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Method

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	10		5	5	5	75	100

***** Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	**MATHEMATICS**	Programme: **B.Sc. (Mathematics)**						
Semester	**Second**	Course Category Code: **DSC** *End Semester Exam Type: **TE**						
Course Code	**A23MAT204D**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**ORDINARY DIFFERENTIAL EQUATIONS**	**3**	**1**	**0**	**4**	**25**	**75**	**100**

Prerequisite	Mathematics should be a subject in +2.		
Course Objectives	To identify an ordinary differential equation and its order.		
	To evaluate first order differential equations.		
	To find solutions of exact equations.		
	To know about the particular integral.		
	To solve differential equations using variation of parameter.		
Course Outcome	**On completion of the course, the students will be able to**		BT Mapping (Highest Level)
	CO1	Understand the order, degree of differential equation.	**K2**
	CO2	Determine solutions to first order linear differential equations.	**K2**
	CO3	Familiarize the orthogonal trajectory of the system of curves on a given surface.	**K3**
	CO4	Solving linear differential equation with constant coefficient.	**K3**
	CO5	Find the complete solution of a differential equation with constant coefficients by variation of Parameter.	**K3**

UNIT-I	**FIRST ORDER DIFFERENTIAL EQUATIONS**	**Periods: 12**	
Differential Equation, Order and Degree of a Differential equation – Formation of a differential equation – Wronskian – definition – linearly dependent and independent set of functions.			**CO1**
UNIT-II	**EXACT DIFFERENTIAL EQUATIONS**	**Periods: 12**	
Equation of first order and first degree – separation of variables – Necessary and sufficient conditions for a differential equation of first order and first degree to be exact – integrating factor – linear Differential equation – Equation reducible to linear form (Bernoulli's equation).			**CO2**
UNIT-III	**DIFFERENTIAL EQUATIONS**	**Periods: 12**	
Trajectories – orthogonal trajectories (cartesian and polar co-ordinates) – Equation solvable for p – Equation solvable for x and y – Equation in Clairaut's form - General and singular solution.			**CO3**
UNIT-IV	**DIFFERENTIAL EQUATIONS (HIGHER ORDER)**	**Periods: 12**	
Linear differential equations with constant coefficients – finding complementary function and Particular Integrals of the form $e^{mx}, \sin mx, x^m, e^{ax}\,X$ where X is a function of x.			**CO4**
UNIT-V	**DIFFERENTIAL EQUATIONS WITH VARIABLE COEFFICIENTS**	**Periods: 12**	
Solving Homogeneous linear equations (Cauchy- Euler Equations) - Equation reducible to Homogeneous linear form (Legendre's linear equations) –Method of variation of parameters – Solving ordinary simultaneous differential			**CO5**

equation with constant coefficients.			
Lecture Periods: 45	**Tutorial Periods: 15**	**Practical Periods: -**	**Total Periods: 60**

Text Books

1. M. D. Raisinghania, "Ordinary and Partial Differential Equations", S. Chand & Company Ltd, 2020.
2. E. A. Coddington, " An Introduction to Ordinary Differential Equations", Prentice Hall of India,1991.
3. S. C. Deo, Y. Lakshmi Nathan and V. Raghavendra, "Text Book of Ordinary Differential Equation", Tata McGraw Hill, New Delhi, 2nd Edition, 2002.

Reference Books

S.Narayanan, T.K. Manickavachagom Pillal,"Differential Equations and its Applications" ,Viswanathan Printers & Publishers Pvt. Ltd., 2015.
2. Dr. Arumugam and Mr. A. Thangapandi Issac, "Differential Equations and its Applications", New Gamma Publishing House,2014.
3. E. A. Coddington and H. Davinson, "Theory of Ordinary Differential Equations", McGraw Hill, 1955.

Web References

1. https://mathworld.wolfram.com/OrdinaryDifferentialEquation.html
2. https://nptel.ac.in/courses/111/106/111106100/
3. https://www.youtube.com/watch?v=FU-7xJLpoWg.

* TE – Theory Exam, LE – Lab Exam

COs/POs/PSOs Mapping

Cos	Program Outcomes (POs)					Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
1	3	2	3	2	3	2	3	1
2	3	2	3	2	1	3	2	1
3	3	2	3	3	3	2	3	1
4	2	3	2	3	3	3	2	2
5	3	2	3	3	1	3	2	1

Correlation Level: 1 - Low, 2 - Medium, 3 – High

Evaluation Method

Assessment	Continuous Assessment Marks (CAM)					End Semester Examination (ESE) Marks	Total Marks
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance		
Marks	10		5	5	5	75	100

* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus