SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE
(An Autonomous Institution)
(Approved by AICTE, New Delhi and Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi and Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry

SCHOOL OF ARTS AND SCIENCE

BACHELOR OF SCIENCE

IN

MATHEMATICS

MINUTES OF SECOND BOARD OF STUDIES MEETING

Date: 31.03.2021

Time: 10.00 am to 1.00 pm

Venue: Center IV, School of Arts and Science Block

DEPARTMENT OF MATHEMATICS

Minutes of Second Board of Studies Meeting

The Second Board of Studies meeting of Mathematics Department was held on 31.03.2021 (Wednesday) at 10.00 A.M in the Centre IV , School of Arts and Science block , 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	Chairman
2	Dr. S. Tamilselvan, M.Sc., M.Phil., Ph.D. Professor & Head Department of Mathematics Annamalai UIniversity, Chidambaram- 608 002	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	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	Subject Expert (Academic Council Nominee)
5	Mr. G. Indragoby Associate Director Sensipie Software Solutions(p)Ltd., Chennai	Representative from Industry
6	Prof.N.Vijayan., M.Sc., M.Phil., Associate Professor Department of Mathematics Sri Manakula Vinayagar Engineering College Puducherry - 605107	Internal Member
7	M.Egalite Francis, M.Sc., M.Phil., Associate Professor Department of Mathematics Sri Manakula Vinayagar Engineering College Puducherry - 605107	Internal Member

8	M.Devanathan, M.Sc., M.Phil., Assistant Professor Department of Mathematics Sri Manakula Vinayagar Engineering College Puducherry – 605107	Internal Member
9	K.Raja,M.Sc., M.Phil., Assistant Professor Department of Mathematics Sri Manakula Vinayagar Engineering College Puducherry - 605107	Internal Member
10	K.Ganesan M.Sc., M.Phil., Assistant Professor Department of Mathematics Sri Manakula Vinayagar Engineering College Puducherry - 605107	Internal Member
11	D.Dheebia,M.Sc., M.Phil., Assistant Professor Department of Mathematics Sri Manakula Vinayagar Engineering College Puducherry - 605107	Internal Member
12	Mrs. C. Bavani, M.Sc., M.Phil. Assistant Professor Department of Physics Sri Manakula Vinayagar Engineering College Puducherry - 605107	Internal Member
13	A. Rajappa., M.Sc., M.Phil., Ph.D. Associate Professor Department of Chemistry Sri Manakula Vinayagar Engineering College Puducherry - 605107	Internal Member
14	G.Namitha., M.A., M.Phil., Assistant Professor Department of English Sri Manakula Vinayagar Engineering College Puducherry - 605107	Internal Member

Agenda of the Meeting

1) To Confirm the minutes of first BoS meeting
2) To discuss and approve the Regulation (R- 2020)
3) To discuss and approve the Uniqueness of Curriculum
4) To discuss and approve the Syllabi from I to IV semesters for the B.Sc., Mathematics under Autonomous Regulations R-2020 for the Academic Year 2021-22.
5) To discuss and recommend the panel of examiners to the Academic Council
6) Any other item with the permission of chair

Minutes of the Meeting

Dr. T. Gayathri, Professor & Head/Mathematics, the Chairman of the Board of Studies welcomed the members of the board of studies and thanked them for accepting to become

the member of the Board of Studies .The meeting thereafter deliberated on agenda items that had been approved by the Chairman.

<table>
<tr><td>Item:1</td><td>The Chairman, BoS, appraised the minutes of first BoS, then it is confirmed with the approval for the incorporation of minor revisions needed as mentioned below.
Suggested R-Programming in Statistics-I lab in the third semester & MAT lab in Statistics- II lab in the fourth semester.
Suggested to give heading for every unit in the course Trigonometry.
Suggested to introduce the course Fuzzy Algebra as Discipline Specific Elective.
The above changes are incorporated in the curriculum and syllabus as per the suggestion of BoS members.
The details are given in the Annexure I</td></tr>
<tr><td>Item:2</td><td>The regulation 2020 was discussed and the following suggestions were given by BoS members.
Suggested to rename the course category for the Interdisciplinary courses as IDC
Suggested to rename the course category for the Open Elective Courses as OE
Suggested to rename the course category for the Extension Activity courses as EA
Suggested to fix the maximum credit range is not more than 150
The above corrections are incorporated in regulation 2020 and the details are given in the Annexure II</td></tr>
<tr><td>Item:3</td><td>The Uniqueness of the curriculum such as Skill Enhancement Courses (SEC), Employability Enhancement Courses (EEC) and Ability Enhancement Compulsory Courses (AECC) were discussed by BoS members.
The details are as follows
Skill Enhancement Courses (SEC) for the semester I to VI are
<table>
<tr><th>S.No</th><th>Semester</th><th>Name of the course</th></tr>
<tr><td>1</td><td>I</td><td>Analytical Geometry</td></tr>
<tr><td>2</td><td>II</td><td>Integral Calculus</td></tr>
<tr><td>3</td><td>III</td><td>Numerical Method using C</td></tr>
<tr><td>4</td><td>IV</td><td>Quantitative Aptitude & Reasoning - I</td></tr>
<tr><td>5</td><td>V</td><td>Quantitative Aptitude & Reasoning - II</td></tr>
<tr><td>6</td><td>VI</td><td>Mathematical Modeling</td></tr>
</table>
Employability Enhancement Courses (EEC) for the semester I to VI are
<table>
<tr><th>S.No</th><th>Semester</th><th>Name of the course</th></tr>
<tr><td>1</td><td>I</td><td>C - Programming</td></tr>
<tr><td>2</td><td>II</td><td>JAVA Programming</td></tr>
</table></td></tr>
</table>

	3	III	MAT LAB
	4	IV	Python
	5	V	Data Structure
	6	VI	Computer Graphics

Ability Enhancement Compulsory Courses (AECC) for the semester I to II are

S.No	Semester	Name of the course
1	I	Environmental Studies
2	II	Public Administration

Item:4

The syllabi of the B.Sc Mathematics from first semester to fourth semester were presented by the chairman of BoS and the following suggestions were given by BoS members.

1. The board proposes to shift the topic Jacobian from Unit- I to Unit-II in the course titled " Differential Calculus- A20MAT101"
2. Suggested to rename the course title "Analytical geometry 3D" as "Analytical Geometry".
3. In the course Discrete Mathematics, Unit I can be renamed as Logics and in Unit III, the topics Ring and Fields can be removed

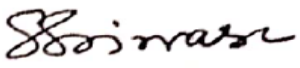
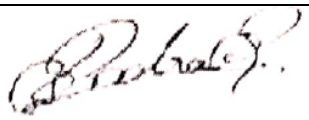
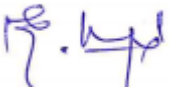
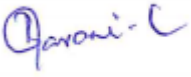
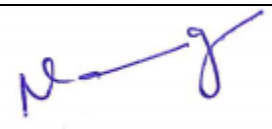
These suggestions were incorporated in the syllabus and approved by the expert members and Recommended to Academic council.
[Details are Attached in Annexure III]

Item:5 The list of question paper setters and Evaluators (given in Annexure IV) was presented and recommended by BoS members to the Academic Council.

Item:6 **Any other agenda – Nil**

The meeting was concluded at 1:00 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	Chairman	
2	Dr.S.Tamilselvan, M.Sc., M.Phil., Ph.D. Professor & Head Department of Mathematics Annamalai UIniversity, Chidambaram- 608 002	Subject Expert (University Nominee)	
3	Dr.P.Balaji, M.Sc., M.Phil., Ph.D. Assistant Professor (Stage II) Department of Mathematics	Subject Expert (Academic Council	

	SCSVMV university, Kanchipuram- 631561	Nominee)	
4	Dr.S.Srinivasan , M.Sc., M.Phil., Ph.D. Assistant Professor Department of Mathematics Periyar Government Arts and Science College, Cuddalore -607003	Subject Expert (Academic Council Nominee)	
5	Mr. G. Indragoby Associate Director Sensipie Software Solutions(p)Ltd., Chennai	Representative from Industry	
6	Prof.N.Vijayan., M.Sc., M.Phil Associate Professor Department of Mathematics SMVEC, Puducherry - 605107	Internal Member	
7	M.Egalite Francis, M.Sc., M.Phil., Associate Professor Department of Mathematics SMVEC, Puducherry - 605107	Internal Member	
8	M.Devanathan, M.Sc., M.Phil., Assistant Professor Department of Mathematics SMVEC, Puducherry - 605107	Internal Member	
9	K.Raja, M.Sc., M.Phil., Assistant Professor Department of Mathematics SMVEC, Puducherry - 605107	Internal Member	
10	K.Ganesan M.Sc., M.Phil Assistant Professor Department of Mathematics SMVEC, Puducherry - 605107	Internal Member	
11	D.Dheebia, M.Sc., M.Phil Assistant Professor Department of Mathematics SMVEC, Puducherry - 605107	Internal Member	
12	Mrs. C. Bavani, M.Sc., M.Phil., Assistant Professor Department of Physics SMVEC, Puducherry - 605107	Internal Member	
13	A. Rajappa., M.Sc., M.Phil., Ph.D., Associate Professor Department of Chemistry SMVEC, Puducherry - 605107	Internal Member	
14	G.Namitha., M.A., M.Phil., Assistant Professor Department of English SMVEC, Puducherry - 605107	Internal Member	

SEMESTER – III										
Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20MAT305	Partial Differential Equation	DSC	3	1	0	4	25	75	100
2	A20MAT306	Fourier Series & Fourier Transforms	DSC	3	1	0	4	25	75	100
3	A20MAT307	Mechanics I (statics)	DSC	3	1	0	4	25	75	100
4	A20MAD305	Statistics - I	IDC	3	1	0	4	25	75	100
5	A20MAE3XX	DSE I*	DSE	3	0	0	3	25	75	100
6	A20XXO3XX	Open Elective-I**	OE	2	0	0	2	25	75	100
Practical										
7	A20MAD306	Statistics – I Lab [using R]	IDC	0	0	4	2	50	50	100
Skill Enhancement Courses										
8	A20MAS303	Numerical Method using C	SEC	3	0	0	3	100	0	100
Employability Enhancement Course										
9	A20MAC303	MAT LAB	EEC	0	0	2	-	100	0	100
							26	400	500	900

SEMESTER – IV										
Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20MAT408	Discrete Mathematics	DSC	3	1	0	4	25	75	100
2	A20MAT409	Operations Research	DSC	3	1	0	4	25	75	100
3	A20MAT410	Mechanics II (Dynamics)	DSC	3	1	0	4	25	75	100
4	A20MAD407	Statistics - II	IDC	3	1	0	4	25	75	100
5	A20MAE4XX	DSE II*	DSE	3	0	0	3	25	75	100
6	A20XXO4XX	Open Elective-II**	OE	2	0	0	2	25	75	100
Practical										
7	A20MAD408	Statistics – II Lab [using MAT lab]	IDC	0	0	4	2	50	50	100

Skill Enhancement Courses										
8	A20MAS404	Quantitative Aptitude & Reasoning - I	SEC	3	0	0	3	100	0	100
Employability Enhancement Course										
9	A20MAC404	Python	EEC	0	0	2	-	100	0	100
							26	400	500	900

Dean SAS
Dr.S. Muthulakshmi

Dr.T. Gayathri
Chairman/ BoS

ANNEXURE I
[Revised Curriculum]

Revised Discipline Specific Elective Courses

Discipline Specific Elective – I (Offered in Semester III)		
Sl. No.	**Course Code**	**Course Title**
1	A20MAE301	Numerical Method
2	A20MAE302	Special Functions
3	A20MAE303	Differential Geometry
Discipline Specific Elective – II (Offered in Semester IV)		
Sl. No.	**Course Code**	**Course Title**
1	A20MAE404	Applied Regression Analysis
2	A20MAE405	Bessel's Functions
3	A20MAE406	Number Theory
Discipline Specific Elective – III (Offered in Semester V)		
Sl. No.	**Course Code**	**Course Title**
1	A20MAE507	Calculus of Variation
2	A20MAE508	Machine Learning
3	A20MAE509	Artificial Intelligence
Discipline Specific Elective – IV (Offered in Semester VI)		
Sl. No.	**Course Code**	**Course Title**
1	A20MAE610	Automata
2	A20MAE611	Fuzzy Algebra
3	A20MAE612	Astronomy

	REVISED STATISTICS – I LAB	L	T	P	C	Hrs
A20MAD306	Using R	0	0	4	2	30

Course Objectives

- To familiarize the concept of Descriptive Statistics
- To know Correlation and Regression analysis.
- To learn the concept of Special Random Variables
- To understand. Skewness and Kurtosis
- To introduce the concepts of Conditional Probability

Course Outcomes

After completion of the course, the students will be able to

CO1 - Gain knowledge in the concepts of Random Variables and Expectation
CO2 - Trained for data collection on various fields of survey enabling them to classify them statistically.
CO3 - Familiarized in various statistical software.
CO4 - Find the correlation between two variables.
CO5 - Compute regression

LIST OF EXERCISES

1. Descriptive Statistics
2. Elements of Probability
3. Random Variables and Expectation
4. Special Random Variables
5. Distribution of Sampling Statistics
6. Parameter Estimation
7. Regression
8. Calculate Coefficient Of Correlation
9. Skewness and Kurtosis
10. Conditional Probability

Text Books

1. S.C Gupta and V.K. Kapoor, “Elements of Mathematical Statistics “, Sultan Chand Publishers, New Delhi. 2009.
2. Aliaga, Gunderson, “Interactive Statistics”, 2nd Edition – Pearson/Prentice Hall
3. Hamilton, “Statistics with STATA”, 8thEdition, Duxbury 2004.

Reference Books

1. P.R.Vittal, “Mathematical Statistics ll”, Margham Publications -2002- Reprint 2012.
2. Weisberg, S, “Applied Linear Regression”, John Wiley and Sons, New York - 1980.
3. Kokoska, “Introductory Statistics: A Problem-Solving Approach”, Review copy, Freeman2011.

Web References

1. https://scilab.in/lab migration/generate lab/167/1
2. https://scilab.in/textbook_companion/generate_book/291
3. http://www.tf.uns.ac.rs/~omorr/radovan_omorjan_003_prII/s_examples/Scilab/Gilberto/scilab15.pdf

A20MAD408	REVISED STATISTICS II LAB Using MAT LAB	L	T	P	C	Hrs
		0	0	4	2	30

Course Objectives

- To familiarize the concept of Mean and Standard deviation.
- To know Statistical Inferences -Continuous Probability Distribution
- To learn the concept of Frequency Distribution
- To understand Poisson distribution.
- To introduce the concepts of Hypothesis Testing.

Course Outcomes

After completion of the course, the students will be able to

CO1 - Gain knowledge in the concepts of Continuous Probability Distribution
CO2 - Trained for data collection on various fields of survey enabling them to classify them Statistically.
CO3 - Familiarized in various statistical software.
CO4 - Find the Mean and Standard Deviation
CO5 - Compute Hypothesis Testing

LIST OF EXERCISES

1. Poisson distribution
2. Lognormal Distribution
3. Normal Distribution
4. Gamma Distribution
5. Weibull distribution
6. Calculate Mean and Standard Deviation
7. Determine Frequency Distribution
8. Discrete Probability Distributions
9. Statistical Inferences -Continuous Probability Distribution
10. Hypothesis Testing

Web References

1. https://scilab.in/lab_migration/generate_lab/167/1
2. https://scilab.in/textbook_companion/generate_book/291
3. http://www.tf.uns.ac.rs/~omorr/radovan_omorjan_003_prII/s_examples/Scilab/Gilberto/scilab15.pdf

Revised syllabus of Trigonometry

A20MAT102	TRIGONOMETRY	L	T	P	C	Hrs
		3	1	0	4	60

Course Objectives

- To familiarize the Expansions of trigonometric functions and their Applications.
- To learn the types of hyperbolic functions.
- To study the basic concept of hyperbolic functions.
- To know the DeMoivre's Property and logarithm.
- To understand the concept of series in trigonometric functions.

Course Outcomes

After completion of the course, the students will be able to

CO1 – Expand Trigonometric functions.
CO2 – Apply the Basic rules of Expansions of power series.
CO3 – Understand the basic concepts o Hyperbolic Functions.
CO4 – Solve the problems by using DeMoivre's Property.
CO5 – Understand various methods for the summation of infinite trigonometric series.

UNIT I EXPANSION OF θ AND EQUATIONS (12 Hrs)

Expansions of $\cos n\theta$, $\sin n\theta$ – Expansion of $\tan n\theta$ in terms of $\tan\theta$ – Expansion of $\tan(A+B+C+...)$ – Formation of Equations.

UNIT II MULTIPLES OF θ AND CIRCULAR FUNCTIONS (12 Hrs)

Powers of sine's and cosines of θ in terms of functions of multiples of θ – Expansion of $\sin\theta$ and $\cos\theta$ in a series of ascending powers of θ – Expansion of Inverse Circular Functions.

UNIT III HYPERBOLIC FUNCTIONS (12 Hrs)

Definition – Relation between Hyperbolic Functions – Inverse Hyperbolic Functions.

UNIT IV PROPERTIES ON CIRCLE AND FACTORS (12 Hrs)

Resolving into Factors – Simple Problems only – De Moivre's Property on the Circle and Cote's Property on the Circle – Logarithm of complex quantities.

UNIT V SUMMATION OF TRIGONOMETRIC SERIES (12 Hrs)

Summation of Trigonometric Series: Method of Differences – Gregory Series – Euler Series.

Text Books

1. S. Narayanan and, T. K. Manicavachagom Pillai, "Trigonometry", S.Viswanathan Printers & Publishers Pvt. Ltd. Chennai, 2004.
2. P. Kandasamy, K. Thilagavathy, "Mathematics for B.Sc. Vol.- I, II, III & IV", S. Chand & Company Ltd., New Delhi-55, 2004.
3. N. P. Bali, "Trigonometry", Krishna Prakasan Mandhir, 9, Shivaji Road, Meerut (UP),1994.

Reference Books

1. S. L. Loney, "Plane Trigonometry", Part II, Cambridge University Press, London.
2. S.Duraipandian and Laxmi Duraipandian, "Trigonometry". Emerald Publishers, Chennai,1984.
3. B. S. Grewal "Higher Engineering Mathematics". Khanna Publishers, New Delhi, 2003.

Web References

1. http://web.mit.edu/jorloff/www/18.01a-esg/OCWTrig.pdf
2. https://faculty.atu.edu/mfinan/trigbook.pdf
3. https://users.auth.gr/~siskakis/GelfandSaul-Trigonometry.pdf

ANNEXURE II

Details of revised Categories of Courses with Credit Ranges

Sl.	Course Category	Course Name	Credit Range	Semesters
1	MIL	Language (Tamil / French)	6	1 & 2
2	English	English	6	1 & 2
3	DSC	Discipline Specific Core Courses	64 to 70	1 to 6
4	DSE	Discipline Specific Elective Courses	12 to 16	1 to 6
5	IDC	Interdisciplinary courses	12 to 24	1 to 4
6	AECC	Ability Enhancement Compulsory Courses	4	1 & 2
7	SEC	Skill Enhancement Courses	12 to 18	1 to 6
8	OE	Open Elective Courses	4	3 to 4
9	EA	Extension Activity	1	2
		TOTAL OF CREDITS	**120 to 149**	
9	EEC	Employability Enhancement Courses (Value Added Certification courses)	6 to 12	1 to 6
GRAND TOTAL			**150 (max)**	

ANNEXURE III

A20MAT101	DIFFERENTIAL CALCULUS	L	T	P	C	Hrs
		3	1	0	4	60

Course Objectives

- To learn the differentiation techniques.
- To gain the knowledge of Tangents and normal.
- To understand the concept of Maxima and minima of function of two and three variables.
- To introduce the angle between the curves.
- To know the notion of curvatures, Evolutes & Involutes and polar co-ordinates.

Course Outcomes

After completion of the course, the students will be able to

CO1 – Know the basics of differential calculus.
CO2 – Understand the tangent and normal concepts.
CO3 – Find maxima and minima for the functions.
CO4 – Solve the angle between the curves.
CO5 – Sketch curves in Cartesian and polar coordinate systems.

UNIT I DERIVATIVES (12 Hrs)

Definition of a derivative – Differentiation techniques – Differentiation of Implicit functions – n^{th} derivative – Leibnitz formula for the n^{th} derivative and applications

UNIT II FUNCTIONS OF SEVERAL VARIABLES (12 Hrs)

Total differential coefficients – Homogeneous functions and Euler's theorem – Partial differentiation – Jacobians – Functions of two and three variables – Equations of tangent and normal – Taylor's theorem.

UNIT III MULTIPLIERS AND NORMAL CURVE (12 Hrs)

Maxima and Minima of two variables – Method of Lagrange's method of undetermined multipliers – Angle of intersection of curves – Sub tangent and Sub Normal.

UNIT IV ANGLE BETWEEN TWO CURVES (12 Hrs)

Angle between the radius vector and tangent – Angle between the intersection of two curves – Polar sub tangent and subnormal.

UNIT V CALCULUS (12 Hrs)

Curvature – Radius of curvature in Cartesian and in Polar Coordinates – Centre of curvature – Evolutes and Involutes.

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.

Web References

1. https://youtu.be/Cn54abNI2TI
2. https://youtu.be/Em5EUstK8Rw
3. https://www.sakshieducation.com/Engg/EnggAcademia/CommonSubjects/M1-Curvature Evolutes

A20MAS101	ANALYTICAL GEOMETRY	L	T	P	C	Hrs
		3	0	0	3	45

Course Objectives

- To learn analytical geometry in two dimensions
- To acquire knowledge of planes and its properties as 3-dimensional objects
- To understand the concepts skew lines ad spheres.
- To know the concept related to geometry of three dimension
- To familiarize the basics of conicoid

Course Outcomes

After completion of the course, the students will be able to

CO1 – Gain a good knowledge about conic sections.
CO2 – Study more about straight lines using coplanar and shortest distance between the lines
CO3 – Analyze the concepts associated with spheres and solve problems using sphere
CO4 – Analyze more about three dimensions using cone and cylinder
CO5 – Familiarize the congruent conics.

UNIT I TWO DIMENSIONS (9 Hrs)

Analytical geometry of 2D – polar coordinates equation of a conic – directrix – chord – tangent – normal – simple problems – only in deriving equation of a conic.

UNIT II THREE DIMENSIONS (9 Hrs)

Analytical Geometry 3D – straight lines – coplanarity of straight line – shortest distance (S.D) and equation of S.D between two lines – simple problems.

UNIT III SPHERE (9 Hrs)

Sphere: standard equation sphere – results based on the properties of a sphere – tangent [lane to a sphere – equation of a circle.

UNIT IV CONE AND CYLINDER (9 Hrs)

Cone and Cylinder: Cone whose vertex is at the origin – envelope cone of a sphere-right circular cone – equation of a cylinder – right circular cylinder.

UNIT V CONICOIDES (9 Hrs)

Nature of a conicoid – standard equation of central conicoid – enveloping cone- tangent plane-condition for tangency –director Sphere – director plane.

Text Books

1. P. Durai Pandian & others, “Analytical Geometry”, United Kingdom Publication, 1968.
2. Thomas Grenfell Vivian, “Analytical Geometry for Beginners: Part I. the Straight Line and Circle” Nabu Press, 2010.
3. T. K. Manicavachagom Pillai & T. Natrajan, “Analytical Geometry, Part II -Three dimensions”, S.Viswanathan, Printers & Publishers Pvt. Ltd. Chennai, 2011.

Reference Books

1. T.K. M. Pillai & Others, “Analytical Geometry of 2D”, Viswanathan Publications, 2006.
2. M. L. Khanna, “Solid Geometry” Jainath & Co Publishers, Meerut, 2015.
3. D. Chatterjee, “Analytical Geometry: Two and Three Dimensions”, Alpha Science International Limited, 2009.

Web References

1. https://www.coursera.org/lecture/fe-exam/analytic-geometry-and-trigonometry-straight-lines-SV8UL
2. https://www.askiitians.com/iit-jee-3d-geometry/
3. http://paulbourke.net/geometry/circlesphere/

A20MAT408	DISCRETE MATHEMATICS	L	T	P	C	Hrs
		3	1	0	4	60

Course Objectives

- To extend student's logical and mathematical maturity and ability to deal with Logics.
- To introduce most of the basic induction principles.
- To understand the basic concepts of combinatory and graph theory.
- To familiarize the applications of algebraic structures.
- To understand the concepts and f lattices and Boolean algebra

Course Outcomes

After completion of the course, the students will be able to

CO1 – Gain knowledge of the concepts needed to test the logic of a program.
CO2 – Understand the concept of Permutations and combinations.
CO3 – Application of Graphs.
CO4 – Know the Algebraic System.
CO5 – Understand the concept Of Boolean Algebra.

UNIT I LOGICS **(9 Hrs)**

Propositional logic–Propositional equivalences – Predicates and quantifiers–Nested quantifiers– Rules of inference - Introduction to proofs–Proof methods and strategy.

UNIT II COMBINATORICS ` **(9 Hrs)**

Mathematical induction–Strong induction and well ordering– The basics of counting – The pigeonhole principle – Permutations and combinations – Recurrence relations –Solving linear recurrence relations –Generating functions – Inclusion and exclusion principle and its applications

UNIT III GRAPHS **(9 Hrs)**

Graphs and graph models – Graph terminology and special types of graphs – Matrix representation of graphs and graph isomorphism –Connectivity –Euler and Hamilton paths.

UNIT IV AGEBRAIC STRUCTURES **(9 Hrs)**

Algebraic systems – Semi groups and monoids – Groups–Subgroups–Homomorphism's – Normal subgroup and co sets – Lagrange's theorem.

UNIT V LATTICES AND BOOLEAN ALGEBRA **(9 Hrs)**

Partial ordering–Po sets–Lattices as posets–Properties of lattices-Lattices as algebraic systems – Sub lattices – Direct product and homomorphism – Some special lattices – Boolean algebra.

Text Books

1. Rosen, K.H., "Discrete Mathematics and its Applications", Tata McGraw Hill Pub.Co.Ltd., NewDelhi, Special IndianEdition, 7th Edition, 2011.
2. Tremblay,J.P.and Manohar.R,"Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw Hill Pub.Co. Ltd, New Delhi, 30th Reprint, 2011.
3. Kenneth H. Rosen, "Discrete Mathematics and its Applications", 5th edition, Tata McGraw - Hill Publishing Company, Pvt. Ltd., New Delhi, 2003.

Reference Books

1. Grimaldi,R.P."Discrete and Combinatorial Mathematics: An Applied Introduction", 4thEdition, Pearson Education Asia, Delhi, 2007.
2. Lipschutz.S and Mark Lipson, "Discrete Mathematics", Schaum's Outlines, Tata McGraw Hill Pub.Co. Ltd., New Delhi, 3rdEdition, 2010.

3. Koshy. "Discrete Mathematics with Applications" Elsevier Publications, 2006.

Web Resources

1. https://nptel.ac.in/courses/111/107/111107058/
2. https://nptel.ac.in/courses/111/104/111104026/
3. https://nptel.ac.in/courses/106/106/106106183/

ANNEXURE IV

SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE
(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi, ISO 9001:2000 Certified Institution & Accredited by NAAC with "A" Grade)
(An Autonomous Institution)
(As per UGC Regulations 2018)
Madagadipet, Puducherry - 605 107

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