KANNUR UNIVERSITY
കണ്ണൂർ സർവകലാശാല

(Abstract)

FYUG Mathematics Programme – Syllabi of Three Mathematics DSC Courses – Approved for Inclusion in the FYUGP Course Basket and Implemented with effect from the 2026 Admission – Orders Issued.

ACADEMIC C SECTION

ACAD/ACAD C1/14282/2026 Dated: 05.11.2026

Read:-1. U O No ACAD/FYSC- I I U2LO32 12024 dated 18.10.2024

2. U.O. No. ACAD C/ACAD CLI2L547 12024 dated 04.02.2025

3. U.O. No. ACAD C/ACAD CLI2L547 I2024 dated 14.08.2025

4. E-mail from the Principal , Nehru Arts and Science College, Kanhangad , dated 24.07.2026

5 . Minutes of the meeting of the Board of Studies in Mathematics held on 04.08.2026

6. E mail from the Dean, Faculty of Science , dated 10.08.2026

7. Orders of the Vice Chancellor in the file of even no., dtd 17.08.2026

8. Minutes of the meeting of the Standing Committee of the Academic Council held on 08.10.2026

9. Orders of the Vice Chancellor in the file of even no., dtd 17.10.2026

ORDER

1. The Scheme and Syllabi of the First and Second Semesters of the B.Sc. Mathematics Honours/Honours with Research Programme (FYUGP) offered in the affiliated colleges of Kannur University were approved and implemented with effect from the 2024 admission, as per the paper read as (1) above. Subsequently, the modified syllabi for the Second Semester and the syllabi for the Third to Eighth Semesters were approved as per the papers read as (2) and (3) above, respectively.

2. Subsequently, the Principal, Nehru Arts and Science College, Kanhangad, submitted the syllabi of three Mathematics DSC Courses for inclusion in the FYUG Course Basket, as per the paper read as (4) above.

3. The Board of Studies in Mathematics (UG), at its online meeting held on 04.08.2026, considered the syllabi of the three Mathematics DSC Courses and strongly recommended their inclusion in the FYUG Course Basket, as per the paper read as (5) above.

4. The minutes of the meeting of the Board of Studies in Mathematics (UG), along with the Syllabi of the three DSC Courses, were thereafter forwarded to the Dean, Faculty of Science, for remarks. The Dean, vide the paper read as (6) above, conveyed his support for the recommendations of the

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Board of Studies in Mathematics (UG).

5. The matter was placed before the Standing Committee of the Academic Council, as ordered by the Vice-Chancellor. Accordingly, the Standing Committee of the Academic Council, at its meeting held on 08.10.2026, considered the Syllabi of the three DSC Courses submitted by the Principal, Nehru Arts and Science College, Kanhangad, for inclusion in the FYUGP Course Basket and recommended their approval, vide paper read as (8) above.

6.The Vice Chancellor, after considering the recommendations of the Standing Committee of the Academic Council , and in exercise of the powers of the Academic Council conferred under Section 11(1), Chapter III of the Kannur University Act, 1996, and all other enabling provisions read together therewith, has approved the Syllabi of the three Mathematics DSC Courses for inclusion in the FYUG Course Basket and incorporation into the syllabi of the First to Third Semesters of the FYUG Mathematics Programme, with effect from the 2026 admission, subject to reporting the matter to the Academic Council.

7. The syllabi of the three Mathematics DSC Courses approved for inclusion in the FYUG Course Basket and incorporation into the syllabi of the First to Third Semesters FYUG Mathematics Programme, with effect from the 2026 admission, are appended to this U.O. and uploaded on the University website.

8. Orders are issued accordingly.

KANNUR UNIVERSITY
CIVIL STATION P.O.
KANNUR
Pin-670 002
THAVAKKARA

Sd/-
Bindu K P G
Joint Registrar (Acad)
For REGISTRAR

To: The Principal,Nehru Arts and Science College, Kanhangad.

Copy To: 1. The Controller of Examinations (Through PA to CE)
2. The Chairperson, BoS in Mathematics (UG)
3. JR (Exam)/ AR VII (Exam)/SO (EXC1)
4. PS to VC/PA to R
5. AR/JR (Academic)
6.IT Cell (For uploading in the website)
7. SF/DF/FC

Forwarded / By Order

SECTION OFFICER

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MATHEMATICS

Discipline Specific Course

KU1DSCMAT120 Differential Calculus

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
I	DSC	100	**KU1DSCMAT120**	4	60

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4		1	30	70	100	2

Course Description

This course introduces fundamental concepts in calculus covering functions, limits, Continuity and differentiation alongside some applications of differentiation.

Course Prerequisite

Familiarity with functions

Course Outcomes

CO No.	Expected Outcome	Learning Domains
1	Comprehend the concepts of various functions - algebraic functions, trigonometric functions, exponential functions, logarithmic function	Understand
2	Understand the notion of limit and limit laws	Understand
3	Understand continuity of a function	Understand
4	Comprehend the notion of derivative of a function and differentiation rules	Understand

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Signature of Registrar (Academic) Dated 12/03/2026 08:06:04

5	Comprehend the notion of functions of several variables and partial differentiation, directional derivatives and gradient vectors	Understand
6	Understand the concepts of monotonic functions, extreme values of functions, concavity and point of inflection	Understand
7	Applying the concepts of differentiation in finding the extreme values, in verifying the concavity of functions and in ascertaining whether a function is increasing or decreasing	Apply

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2	✓						
CO 3	✓						
CO 4	✓		✓				
CO 5	✓		✓				
CO 6	✓						
CO 7	✓			✓		✓	

COURSE CONTENTS
Contents for Classroom Transaction

COURSE MODULE	UNIT	DESCRIPTION	HOURS
I		**Functions, Limits and Continuity**	**12**
	1	(a) Functions and their graphs	
		(b) Limit of a function and limit laws	
		(c) Continuity	
II		**Differentiation**	**12**

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	1	(a) The derivative as a function	
		(b) Differentiation rules	
		(c) Derivatives of trigonometric functions	
		(d) The chain rule	
		(e) Implicit differentiation	
III	**Partial Differentiation**		**12**
	1	(a) Functions of several variables	
		(b) Partial derivatives	
		(c) The chain rule	
		(d) Directional derivative and gradient vectors	
IV	**Applications of Differentiation**		**12**
	1	(a) Extreme values of functions on closed intervals	
		(b) Monotonic functions and the first derivative test	
		(c) Concavity and point of inflexion	
V	**Teacher Specific Module**		12
		The Derivative as a Rate of Change	
		Curve sketching	
		Any topic related to Module I, II, III & IV	

Essential reading

Joel Hass, Christopher Heil and Maurice D. Weir, *Thomas' Calculus (14th edition)*, Pearson Education

Reference Distribution Module	Reference No.	Sections	Remarks

I	1	Sections 1.1, 1.3, 2.2, 2.5	*Problems on continuity are excluded*
II	1	Sections 3.2, 3.3, 3.5, 3.6, 3.7	*Proofs of theorems are excluded*
III	1	Sections 14.1, 14.3, 14.4, 14.5	
IV	1	Sections 4.1, 4.3, 4.4	
V	1	Sections 3.4, 4.4	

Suggested readings

1. Anton, H., Bivens, I., & Davis, S. (2012). *Calculus* (10th ed.). Wiley.
2. Grewal, B. S. (2015). *Higher Engineering Mathematics* (43rd ed.). Khanna Publishers
3. Narayan, S., & Mittal, P. K. (2014). *Differential Calculus* (Revised ed.). S. Chand & Company Ltd.
4. Kreyszig, E. (2011). *Advanced Engineering Mathematics* (10th ed.). Wiley.

Assessment rubrics

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper *	12
b)	Assignment	12
c)	Seminar, Viva-Voce	6
Total		**100**

*** A student has to appear for at least two written tests. Average mark of best two tests is to be considered for internal mark.**
**** Use of Scientific Calculators below 100 functions (that is, upto *fx 99*) shall be permitted.**

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MATHEMATICS

Discipline Specific Course

KU2DSCMAT120 Integral Calculus and Fundamentals on Matrices

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
II	DSC	100	**KU2DSCMAT120**	4	60

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4		1	30	70	100	2

Course Description

This course introduces fundamental concepts in calculus covering integration, various methods of integration and multiple integration and preliminary concepts of matrices, solution of simultaneous equations, rank of matrices and Gauss - Jordan elimination.

Course Prerequisite

Familiarity with functions, derivatives, matrices

Course Outcomes

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CO No.	Expected Outcome	Learning Domains
1	Comprehend the concept of indefinite and definite integrals	Understand
2	Comprehend the concepts of double and triple integrals	Understand
3	Apply the concept of double integral for finding area of regions	Apply
4	Understand basic matrix operations	Understand

5	Understand rank of a matrix, elementary row and column operations	Understand
6	Solve systems of linear equations using row-echelon form	Understand

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2	✓		✓				
CO 3	✓		✓	✓			
CO 4	✓		✓				
CO 5	✓		✓				

COURSE CONTENTS

Contents for Classroom Transaction

MODULE	UNIT	DESCRIPTION	HOURS
I		**Integral of a function**	12
	1	(a) Indefinite integral and the substitution method	
		(b) Using basic integration formulae	
		(c) Integration by parts	
		(d) Trigonometric substitutions	
		(e) Integration of rational functions by partial fractions	
		(f) The definite integral	
II		**Multiple Integrals**	
	1	(a) Double and iterated integrals over rectangles	
		(b) Double integrals over general regions	

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		(c) Area by double integrals	**12**
		(d) Double integrals in polar form	
		(e) Triple integrals in rectangular co-ordinates	
III	**Matrices – Basic Operations**		
	1	a) Matrix Addition, Subtractions, Scalar Multiplication, Matrix Multiplication and Transpose of a Matrix.	
		b) Row-Echelon form	**12**
		c) Elementary Row and Column Operations	
		d) Rank of a Matrix	
IV	**Simultaneous Linear Equations**		
	1	(a) Consistency, Matrix notation	12
		(b) Theory of solutions, Simplifying operations	
V	**Teacher Specific Module**		12
		Numerical integration	
		Any topic related to Module I, II, III & IV	

Essential reading

1. **Joel Hass, Christopher Heil, Maurice D. Weir, *Thomas' Calculus (14th ed.)*, Pearson**
2. **Bronson, R. (2011), *Theory and Problems of Matrix Operations* (2nd ed.), Schaum's Outline Series, McGraw-Hill.**

Reference Distribution Module	Reference No.	Sections	Remarks
I	1	Sections 5.5, 8.1, 8.2, 8.4, 8.5	*Proof of theorems are excluded*
II	1	Sections 15.1, 15.2, 15.3, 15.4, 15.5	
III	2	Chapter 1	
IV	2	Chapter 2	
V	1	Section 8.7	

Suggested readings

1. Anton, H., Bivens, I., & Davis, S. (2012). *Calculus* (10th ed.). Wiley.
2. Grewal, B. S. (2015). *Higher Engineering Mathematics* (43rd ed.). Khanna Publishers
3. Narayan, S., & Mittal, P. K. (2014). *Differential Calculus* (Revised ed.). S. Chand & Company Ltd.
4. Kreyszig, E. (2011). *Advanced Engineering Mathematics* (10th ed.). Wiley.
5. Narayan, S. & Mittal, P. K. (2004*). Textbook of Matrices*. S. Chand & Company Ltd.
6. Ayres, F. Jr. (1966). *Theory and Problems of Matrices* (Schaum's Outline Series). McGraw-Hill.

Assessment rubrics

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper *	12
b)	Assignment	12
c)	Seminar, Viva-Voce	6
Total		**100**

*** A student has to appear for at least two written tests. Average mark of best two tests is to be considered for internal mark.**

**** Use of Scientific Calculators below 100 functions (that is, upto *fx 99*) shall be permitted.**

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Mathematics

Discipline Specific Course

KU3DSCMAT220 Linear Algebra

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
III	DSC	200	**KU3DSCMAT220**	4	60

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4		1	30	70	100	2

Course Description

This course introduces concepts of inverse of a matrix, eigen values and eigen vectors. Discussed topics include solutions of simultaneous linear equations, Cayley-Hamilton theorem and its applications to find inverses.

Course Prerequisite

Familiarity with functions, derivatives, matrices

Course Outcomes

CO No.	Expected Outcome	Learning Domains
1	Comprehend the concept of inverse of a matrix	Understand
2	Understand Gauss-Jordan elimination	Understand
3	Comprehend the concepts of eigen values	Understand
4	Understand Cayley-Hamilton theorem and apply it for finding inverse of a matrix	Understand, Apply
5	Understand the concepts of vector spaces and subspaces	Understand

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓		✓				
CO 2	✓		✓				
CO 3	✓		✓				
CO 4	✓		✓				
CO 5	✓						✓

COURSE CONTENTS
Contents for Classroom Transaction

MODULE	UNIT	DESCRIPTION	HOURS
I		**Inverse of a matrix**	12
	1	(a) Inverse of a matrix	
		(b) Gauss-Jordan elimination – Determination of the inverse by the Gauss- Jordan method	
		(c) Formulae for inverses	
		(d) Determinants of matrix products	
II		**Eigen values and Cayley-Hamilton theorem**	12
	1	(a) The matrix eigen value problem	
		(b) Determining eigen values and eigen vectors	
		(c) How to find eigen values and eigen vectors	
		(d) Some applications of eigen value problems	
		(e) Cayley-Hamilton theorem and finding inverses	
III		**Vector spaces and subspaces**	12
	1	a) Vector spaces – definition and examples	
		b) Subspaces	
		c) Linear combination	
IV		**Linear dependence and independence, bases**	12
	1	(a) Linear independence and dependence	
		(b) Bases and dimension	
V		**Teacher Specific Module**	12
		Eigen bases, diagonalization, quadratic forms	
		Any topics related to Modules I, II, III & IV	

Essential reading

1. **Erwin Kreyszig, *Advanced Engineering Mathematics (10th edition)*, Wiley**
2. **Bronson, R. (2011), *Theory and Problems of Matrix Operations* (2nd ed.), Schaum's Outline Series, McGraw-Hill.**
3. **Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence, *Linear Algebra*, Pearson (2016)**

Reference Distribution Module	Reference No.	Sections	Remarks
I	1	Section 7.8	*Proof of all theorems are excluded*
II (a) (b) (c) (d)	1	Sections 8.1, 8.2	
II (e)	2	Chapter 7	
III	3	Sections 1.2, 1.3, 1.4	
IV	3	Sections 1.5, 1.6, 1.7	
V	1	Section 8.4	

Suggested readings

1. **Grewal, B. S. (2015). *Higher Engineering Mathematics* (43rd ed.). Khanna Publishers**
2. **Kreyszig, E. (2011). *Advanced Engineering Mathematics* (10th ed.). Wiley.**
3. **Narayan, S. & Mittal, P. K. (2004*). Textbook of Matrices*. S. Chand & Company Ltd.**
4. **Ayres, F. Jr. (1966). *Theory and Problems of Matrices* (Schaum's Outline Series). McGraw-Hill.**
5. **Gilbert Strang, *Linear Algebra and its Applications*, Cengage Learning**

Assessment rubrics

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper *	12
b)	Assignment	12
c)	Seminar, Viva-Voce	6
Total		**100**

*** A student has to appear for at least two written tests. Average mark of best two tests is to be considered for internal mark.**
**** Use of Scientific Calculators below 100 functions (that is, upto *fx 99*) shall be permitted.**