King Mongkut's University of Technology Thonburi

Department of Mathematics, Faculty of Science

Teaching Program

Course title MTH 10202 Vectors, Lines and Planes in a 3D-Space and Vector Functions

Semester 2/2023

Course instructors

Asst.Prof.Dr.SAEID ZAHMATKESH KOMELEH	Sec 31
Asst.Prof.Dr.Songpon Sriwongsa	Sec 32
Asst.Prof.Dr.SAEID ZAHMATKESH KOMELEH	Sec 34

Course description

Scalars and vectors, inner product, vectors product, scalar triple product, line and plane in 3D-space, vector function, curves, tangent, velocity and acceleration, curvature and torsion of a curve.

Objectives

After completion of this course, students will be able to

1. Describe and compute about scalars and vectors
2. Find and describe equation of lines and plane in a 3D-space.
3. Describe the basic geometry and concept of vector functions and to apply in some applications.

Ultimate Learning Outcome

Able to calculate vector operations, to express the equations of lines and planes in a 3D-space, and to analyze vector functions.

Teaching Plan

Week	Contents	Learning Outcomes	Learning Activity
1	Properties and Vector Algebra, Scalar Multiplication, Inner Product	Describe and compute about scalars and vectors	Lecture
2	Vector Product, Scalar Product of Three Vectors, Linear Line in 3D-space	- Describe and compute about scalars and vectors - Find and describe equation of lines and plane in a 3D-space	Lecture / Self Practice (LEB2)
3	Plane in 3D-space, Vector Function, Curve	- Find and describe equation of lines and plane in a 3D-space - Describe the basic geometry and concept of vector functions and to apply in some applications	Lecture / Self Practice (LEB2)
4	Tangent Line, Velocity, Acceration	- Describe the basic geometry and concept of vector functions and to apply in some applications	Lecture / Self Practice (LEB2) / Tutorial
5	Curvature and radius of curvature	- Describe the basic geometry and concept of vector functions and to apply in some applications	Lecture / Self Practice (LEB2) / Tutorial
6	**Exam 2 (Thursday 28th, March 2024 Time 9.00-11.00 am.)**		

Course Level Learning Outcomes : CLOs

Learning Outcomes	Assessment	Week	Assessment Portion
Able to calculate vector operations, to express the equations of lines and planes in a 3D-space, and to analyze vector functions.	2nd Examination for the semester 2/23	13	100%

Rubric

Level 1	No evidence
Level 2	Able to calculate simple vector operations including the derivative of vector functions.
Level 3	Able to find area and volume formed by vectors. Able to write equations of lines and planes in a 3D-space. Able to find the curvature and torsion.
Level 4	Understand about vectors, lines and planes by showing calculation in vector operations and be able to analyze the concept of vector functions used in applications.
Level 5	Understand completely about vectors, lines and planes by showing correct calculation in vector operations and be able precisely describe lines and planes in a 3D-space using mathematics equations in applications and analyze the concepts used in applications and provide physical interpretation.

Grade	**Scales (total 100 points)**
A (Rubric level 5)	>= 80
B+ (Rubric level 4)	70 – 79
B (Rubric level 4)	60 – 69
C+ (Rubric level 3)	50 – 59
C (Rubric level 3)	40 - 49
D+ (Rubric level 2)	33 - 39
D (Rubric level 2)	25 - 32
F	< 25

Textbooks and Core Instructional Materials

1) Anton H., Bivens I., Davis S., *Calculus*, 7th ed., New York, John Wiley & Sons, 2002
2) Finney R.L., Weir M.D., Giordano F.R., *Thomas' Calculus*, updated 10th ed., New York, Addison Wesley, 2003.
3) Smith, R.T., Minton, R.B., *Calculus*, 2nd ed., New York, McGraw-Hill, 2002

Remark:

All students must join

Facebook: MTH101-102 international KMUTT

https://www.facebook.com/groups/268325992606513