Department of Mathematics
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| **Course** | **Course Name** | **: Mathematics II** |
| | **Course Code** | **: KM184201** |
| | **Credit** | **: 3** |
| | **Semester** | **: 2** |

| **Description of Course** |
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| This course provides basic concepts of mathematical thinking (completion existence, logic flow / settlement procedure) to students in solving real problems and can solve engineering problems, modeling and others in engineering related to integral application. as well as the ability to follow advanced courses that require basic concepts of mathematics and analysis.<br><br>The lecture materials include: The concept of integration techniques, certain Integral Concepts, improper integrals and their Applications, Polar coordinates and parametric equations and their applications of flat area and arc length, sequences and Unfinished series, power series, Taylor Series and Mac Laurin series. |

| **Learning Outcome** | |
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| PLO 1 | Able to interpret the basic concepts of mathematics and establish direct, indirect or induced mathematics proof |
| PLO 2 | Able to identify simple problems, form mathematical models and solve them |
| PLO 3 | Mastering standard methods in mathematics |

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| PLO 4 | Able to master the fundamental theory of mathematics including the concepts of sets, functions, differentials, integrals, geometry and structure of mathematics. |
| PLO 5 | Able to identify problems, form mathematical models and solve them |

**Course Learning Outcome**

1. Able to master the basic concept of integration techniques.
2. Able to complete a certain Integral.
3. Ability to apply certain integrals on the plane area, the volume of objects by disc method and ring method, center of mass, application of Guldin theorem, force and fluid pressure.
4. Able to understand the polar coordinate system and parametric equations, can draw the graph, apply to the Area of the plain and the length of the arc
5. Able to calculate the convergence of sequences, able to test the unmeasured series convergence and calculate the infinite series to converge, transform the function into the Taylor series or Mac Laurin series

**Main Subject**

1. The concept of integration technique: Partial Integral,: Integral fs rational (linear factors, quadratic factors), Integration of trigonometric functions, reduction form, Int with trigonometric substitution (root form).
2. Certain Integral Concepts: Certain broad and integral issues, Evaluation of a given Int: Fundamental Theory of Calculus (I), a particular Int with substitution, Functions expressed as certain integrals, Fundamental Theory of Calculus (II) and improper integral
3. Certain integral applications: Plane area, Volume of rotary objects (method of discs, rings), Fluid style and pressure, Work (Business), Dot (Mass center), emphasis and Guldin's Theorem

4. Polar coordinates and parametric equations: Functions and graphs in polar coord, Plain area and arc length in polar coord, Functions in parametric form, Area and length of arc parametric functions
5. Unfinished sequence and sequence: sequences , convergence sequence, Incomplete series, convergence test and generating number of incompatible to convergent series, notion of power series, Taylor series and MacLaurint series.

**Prerequisites**

**Reference**


1. Tim Dosen Jurusan Mathematics ITS, *Buku Ajar Matematika 2* , Jurusan Mathematics ITS, 2022
2. Anton, H. dkk, *Calculus*, 10-th edition, John Wiley & Sons, New York, 2012


**Supporting Reference**


1. Kreyzig, E, *Advanced Engineering Mathematics*, 10-th edition, John Wiley & Sons, Singapore, 2011
2. Purcell, J, E, Rigdon, S., E., *Calculus*, 9-th edition, Prentice-Hall, New Jersey, 2006
3. James Stewart , *Calculus*, ed.7, Brooks/cole-Cengage Learning, Canada,2012