MATH 102 Engineering Mathematics II

Course Code	Course Name	Semester	
MATH 102	Engineering Mathematics II	Fall ☐ Spring ☒ Summer ☐	
Hours		**Credit**	**ECTS**
Theory	**Practice** / **Lab**	4	6
4	0 / 0		

Course Details	
Department	Aerospace Engineering
Course Language	English
Course Level	Undergraduate ☒ Graduate ☐
Mode of Delivery	Face to Face ☒ Online ☐ Hybrid ☐
Course Type	Compulsory ☒ Elective ☐
Course Objectives	1- To be able to learn and apply the concept of integral, 2- To apply convergence tests for positive quadratic series, 3- To be able to calculate limits and derivatives of multivariable functions and calculate double integral
Course Content	The applications of definite integral, sequences, convergence tests for series and positive series, limits and derivatives of multivariable functions, double integral.
Course Method/ Techniques	Lecture ☒ Question & Answer ☐ Presentation ☐ Discussion ☐
Prerequisites/ Corequisites	MATH 101 – Engineering Mathematics 1
Work Placement(s)	

Textbook/References/Materials

- G.B Thomas, J. Hass, M.D.Weir, C. Heil, *Thomas' Calculus,* 14th Edition, (Pearson Global Edition)
- R.A. Adams, *Calculus*: A complete course 8-th revised ed. , Prentice Hall, 2013.
- J. Stewart, *Calculus*, Metric Version, Eighth Edition, 2016, Cengage Learning

Course Category				
Mathematics and Basic Sciences	☒		Education	☐
Engineering	☐		Science	☐
Engineering Design	☐		Health	☐
Social Sciences	☐		Profession	☐

Weekly Schedule

No	Topics	Materials/Notes
1	Techniques of Integration	
2	Techniques of Integration	
3	Infinite Sequences and Series	
4	Infinite Sequences and Series	
5	Parametric Equations and Polar Coordinates	
6	Parametric Equations and Polar Coordinates	
7	Midterm Exam	
8	Vectors and the Geometry of Space	
9	Vector Valued Functions and Motion in Space	
10	Partial Derivatives	
11	Partial Derivatives	
12	Multiple Integrals	
13	Multiple Integrals	
14	Integrals and Vector Fields	
15	Integrals and Vector Fields	
16	Final Exam	

Assessment Methods and Criteria		
In-term studies	**Quantity**	**Percentage**
Attendance		
Lab		
Practice		
Fieldwork		
Course-specific internship		
Quiz/Studio/Criticize		
Homework		
Presentation / Seminar		
Project		
Report		
Seminar		
Midterm Exam	1	40%
Final Exam	1	60%
	Total	**100%**
Contribution of Midterm Studies to Success Grade		
Contribution of End of Semester Studies to Success Grade		
	Total	**100%**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration (Hrs)**	**Total Workload**
Course Hours	16	4	64
Lab			
Practice			
Fieldwork			
Course-specific Work Placement			
Out-of-class study time	14	3	42
Quiz/Studio/Criticize			
Homework			
Presentation / Seminar			
Project			
Report			
Midterm Exam and Preparation for Midterm	1	15	15
Final Exam and Preparation for Final Exam	1	20	20
Total Workload			**141**
Total Workload / 25			**5,64**
ECTS Credit			**6**

Course Learning Outcomes	
No	**Outcome**
L1	Evaluate integrals using techniques of integration, such as substitution, inverse substitution, partial fractions and integration by parts
L2	Determine convergence/divergence of improper integrals, and evaluate convergent improper integrals.
L3	Estimate and compare series and integrals to determine convergence.
L4	Graph polar coordinate equations.
L5	Sketch the graph of surfaces in the three-dimensional coordinate systems
L6	Take the derivative of functions with several variebles.
L7	Evaluate double integrals over rectangles
L8	Evaluate triple integrals over rectangles.

Contribution of Course Learning Outcomes to Program Competencies/Outcomes

Contribution Level: 1: Very Slight, 2: Slight, 3: Moderate, 4: Significant, 5: Very Significant

	P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**	**P11**	**Total**
L1	5	5		3								13
L2	5	4			3							12
L3	5	5			3							13
L4	4		3	4								11
L5	4		4	5								13
L6	5	5		4								14
L7	5	4		4								13
L8	5	4		4								13
											Total	**102**