

Applied Mathematics 2

Basic Course Information			
Course Number	31050216	Subject Category	Compu/Sci/Eng
Class Format	Lecture	Credit Type and Number of Credits	1
Department	Mechatronics	Student Category	Year 3
Period of Study	Semester 2	Classes per Week	2
Required Materials	Mathematics B ¹ by A. Shnizu, Y. Khikawa, M. Kobayashi, and M. Sakaguchi (summary) and Advance Engineering Mathematics 10th ed by E. KREYSZIG		
Instructor	Parham Semmetta	Adison Doodle	

Course Objective			
When successfully completed the course, students will be able to:			
1.	explain what Laplace transform and Fourier transform are and their applications		
2.	find the Laplace transform of given function and apply it to solve ordinary differential equation		
3.	find the Fourier transform of given function and apply it in engineering		

Evaluation (Rubric)	Ideal Level of Achievement (Very Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fail)
Evaluation 1	Students can fully explain what Laplace transform and Fourier transform are and their applications	Students can partly explain what Laplace transform and Fourier transform are and their applications	Students can't partly explain what Laplace transform and Fourier transform are and their applications
Evaluation 2	Students can find the Laplace transform of given complex function and can apply it to solve ordinary differential equation	Students can find the Laplace transform of given basic function and can apply it partly to solve ordinary differential equation	Students can't find the Laplace transform of given function and can't apply it to solve ordinary differential equation
Evaluation 3	Students can find the Fourier transform of given complex function and can apply it to solve partial differential equation	Students can find the Fourier transform of given basic function and can apply it partly to solve partial differential equation	Students can't find the Fourier transform of given function and can't apply it to solve partial differential equation

Relationship with Learning Outcomes	
G(1) Wide knowledge on Science and Engineering and practical ability to apply them to solve problems in the society.	
G(4) Creativity to make a new value with fusing the knowledge from various fields.	
Please change	

Teaching Method	
Outline:	Repeat of Lecture - Drill - Presentation
Class Format:	
Please Note:	The class schedule will be changed based on student conditions and more.

Course Plan		Related MCC
Semester 2	Contents and Method of Course	
1st Week	Introduction to the Laplace Transforms	V.A. B 171
2nd Week	Introduction to the Inverse Laplace Transforms	V.A. B 172
3rd Week	The Laplace Transforms of Derivatives and Solving ODEs with the Laplace Transforms	V.A. B 172
4th Week	Laplace transforms of Unit Step function and others	V.A. B 171
5th Week	Laplace transforms Dirac Delta functions	V.A. B 171
6th Week	Laplace transforms of convolutions and integral equations	V.A. B 172
7th Week	Review	Week 1-6
8th Week	Midterm Examination	Week 1-6
9th Week	Midterm Examination	Week 1-6
10th Week	No Class	
11th Week	Introduction to Fourier Series and Fourier Transforms	Students understand the relationship between the Fourier series and Fourier transform and are able to calculate Fourier coefficients of a periodic function of period 2 π .
12th Week	Fourier series of Functions of Arbitrary Period	Students are able to calculate Fourier coefficients of a periodic function of general period.
13th Week	Fourier Cosine, Sine series, and Half-Range Expansions	Students are able to expand any periodic or non-periodic function on an interval [0, L] as a Fourier Cosine or a Fourier Sine.
14th Week	Fourier Transforms and Inverse Fourier Transform Part 1	Students are able to understand the concepts of Fourier and Inverse Fourier transforms and its properties.
15th Week	Fourier Transforms and Inverse Fourier Transform Part 2	Students are able to understand the concepts of Fourier and Inverse Fourier transforms and its properties.
16th Week	Fourier Transforms and Inverse Fourier Transform Part 3	Students are able to understand the concepts of Fourier and Inverse Fourier transforms and its properties.
17th Week	Applications of Fourier Series and Fourier Transforms	Students are able to use Fourier transform in engineering.
18th Week	Review	Week 11-17
19th Week	Final Examination	
20th Week	Return Answer-Sheets, Review Semester and Feedback	

Do not

	Examination	Class Participation	Drill Submission
Basic Ability	20	15	15
Technical Ability	0	0	0
Interdisciplinary Ability	0	0	0