

The College of New Jersey

ENG 272 Advanced Engineering Mathematics I

Instructor: Dr. Ching-Tai Shih

Week	Lecture	Spring 2016
1/25	Introduction to Differential Equations (Chapter 1)	
2/1	”	
2/8	First-Order Differential Equations (Chapter 2)	
2/15	”	
2/22	Higher-Order Differential Equations (Chapter 3)	
2/29	”	
3/7	The Laplace Transform (Chapter 4)	
3/14	Spring Break	
3/21	The Laplace Transform	
3/28	Series Solutions of Linear Differential Equations (Chapter 5)	
4/4	”	
4/11	Vectors (Chapter 7)	
4/18	Matrices (Chapter 8)	
4/25	Systems of Linear Differential Equations (Chapter 10)	
5/2	”	

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- Textbook: Advanced Engineering Mathematics, Dennis G. Zill & Michael R. Cullen, 5<sup>th</sup> Edition
  - This class contains one intensive analytical experiences that require each student to significantly increase out-of-class learning
  - Evaluation of Performance:
    - Class attendance is mandatory.
    - Tests and Assignments -----90%
    - Class Performance -----10%

## **Educational Objectives:**

(What TCNJ engineers should be able to accomplish during the first few years after graduation )

The School of Engineering at The College of New Jersey seeks to prepare its graduates:

- a) To contribute to the economic development of New Jersey and the nation through the ethical practice of engineering;
- b) To become successful in their chosen career path, whether it is in the practice of engineering, in advanced studies in engineering or science, or in other complementary disciplines;
- c) To assume leadership roles in industry or public service through engineering ability, communication skills, teamwork, understanding of contemporary global and socio-economic issues, and use of modern engineering tools;
- d) To maintain career skills through life-long learning and be on the way towards achieving professional licensure.

## **Program Outcomes**

*(What TCNJ Engineering students are expected to know and be able to do at graduation. What knowledge, abilities, tools and skills the program gives the graduates to enable them to accomplish the Educational Objectives)*

The Program Outcomes listed below are expected of all graduates of the Engineering Program.

- a) **an ability to apply knowledge of mathematics, science and engineering;**
- b) an ability to design and conduct experiments, as well as to analyze and interpret data;
- c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- d) an ability to function in multidisciplinary teams;
- e) an ability to identify, formulate and solve engineering problems;
- f) an understanding of professional and ethical responsibility;
- g) an ability to communicate effectively;
- h) the broad education necessary to understand the impact of engineering solutions in a global and societal context;
- i) a recognition of the need for, and an ability to engage in life-long learning;
- j) a knowledge of contemporary issues;
- k) an ability to use the techniques, skills and modern engineering tools necessary for engineering practice;

Specific to this course

- a) **an ability to apply knowledge of mathematics, science and engineering;**  
(linear algebra, vectors, differential equations, Laplace transform, and power series)
- b) an ability to design and conduct experiments, as well as to analyze and interpret data;

- c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- d) an ability to function in multidisciplinary teams;
- e) an ability to identify, formulate and solve engineering problems;
- f) an understanding of professional and ethical responsibility;
- g) an ability to communicate effectively;
- h) the broad education necessary to understand the impact of engineering solutions in a global and societal context;
- i) a recognition of the need for, and an ability to engage in life-long learning;
- j) a knowledge of contemporary issues;
- k) an ability to use the techniques, skills and modern engineering tools necessary for engineering practice;