



## Course Syllabus: Advanced Engineering Mathematics - MSE 200

<b>Division</b>	Physical Science and Engineering Division
<b>Course Number</b>	MSE 200
<b>Course Title</b>	Advanced Engineering Mathematics
<b>Academic Semester</b>	Fall
<b>Academic Year</b>	2019/2020
<b>Semester Start Date</b>	08/25/2019
<b>Semester End Date</b>	12/10/2019
<b>Class Schedule</b> (Days & Time)	09:00 AM - 10:30 AM   Sun Tue

Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Udo Schwingenschloegl	Udo.Schwingenschloegl@kaust.edu.sa	+966128084399 8084399	3233, 3, Ibn Sina (bldg. 3)	I am happy to receive students on one-to-one meeting upon appointment.
Aurelien Christophe Francois Manchon	aurelien.manchon@kaust.edu.sa	+966128084410	3232, 3, Ibn Sina (bldg. 3)	I am happy to receive students on one-to-one meeting upon appointment.

Teaching Assistant(s)	
Name	Email

Course Information	
<b>Comprehensive Course Description</b>	This course aims at introducing important mathematical techniques useful for materials engineers and scientists. It is specifically designed towards students not familiar with mathematical thinking and oriented mostly on hands-on manipulations and calculus. The class covers basic mathematical methods for engineers including: differentiation and integration, Taylor's expansion, linear systems resolution and matrix formalism, partial differential equations, Laplace, Fourier and Legendre transforms, statistics and probability. The class will be mostly oriented towards exercises and problem solving.
<b>Course Description from Program Guide</b>	This course presents basic mathematical methods for engineers including: differentiation and integration, Taylors expansion, linear systems resolution and matrix formalism, partial differential equations, Laplace, Fourier and Legendre transforms, statistics and probability.
<b>Goals and Objectives</b>	At the end of this class, the student should be able to <ul style="list-style-type: none"> <li>-Objective 1: use standard mathematical tools common to engineers</li> <li>-Objective 2: solve linear systems using matrices</li> <li>-Objective 3: solve standard ODEs and PDEs of interest to materials science</li> <li>-Objective 4: analyze statistical sets of data using standard mathematical concepts</li> </ul>
<b>Required Knowledge</b>	Standard undergraduate Math.
<b>Reference Texts</b>	Advanced Engineering Mathematics, Erwin Kreyszig, Wiley; 10 edition (August 16, 2011) <b>ISBN-13:</b> 978-0470458365; <b>ISBN-10:</b> 9780470458365

<b>Method of evaluation</b>	<b>30.00%</b> - Final exam <b>30.00%</b> - Midterm exam <b>30.00%</b> - Homework /Assignments <b>10.00%</b> - Attendance and Participation
<b>Nature of the assignments</b>	The students will be requested to prepare series of problems and present their solution in class.
<b>Course Policies</b>	The students are expected to attend all classes and to submit the homeworks on time. No deadline extension will be granted.
<b>Additional Information</b>	

## Tentative Course Schedule

*(Time, topic/emphasis & resources)*

Week	Lectures	Topic
1	Sun 08/25/2019	Differentiation and integration
1	Tue 08/27/2019	Differentiation and integration
2	Sun 09/01/2019	Differentiation and integration
2	Tue 09/03/2019	Differentiation and integration
3	Sun 09/08/2019	Differentiation and integration
3	Tue 09/10/2019	Differentiation and integration
4	Sun 09/15/2019	Taylor's expansion
4	Tue 09/17/2019	Taylor's expansion
5	Sun 09/22/2019	University holiday
5	Tue 09/24/2019	Taylor's expansion
6	Sun 09/29/2019	Fourier Transforms
6	Tue 10/01/2019	Fourier Transforms
7	Sun 10/06/2019	Fourier Transforms
7	Tue 10/08/2019	Fourier Transforms
8	Sun 10/13/2019	Midterm
8	Tue 10/15/2019	Linear systems resolution
9	Sun 10/20/2019	Linear systems resolution
9	Tue 10/22/2019	Linear systems resolution
10	Sun 10/27/2019	Mid-semester break
10	Tue 10/29/2019	Matrix formalism
11	Sun 11/03/2019	Matrix formalism
11	Tue 11/05/2019	Matrix formalism
12	Sun 11/10/2019	Matrix formalism
12	Tue 11/12/2019	Statistics and probability
13	Sun 11/17/2019	Statistics and probability
13	Tue 11/19/2019	Statistics and probability
14	Sun 11/24/2019	Ordinary differential equations
14	Tue 11/26/2019	Ordinary differential equations
15	Sun 12/01/2019	Ordinary differential equations
15	Tue 12/03/2019	Ordinary differential equations
16	Sun 12/08/2019	Exams
16	Tue 12/10/2019	Exams

### Note

The instructor reserves the right to make changes to this syllabus as necessary.