



Course Syllabus: Advanced Engineering Mathematics - MSE 200

Division	Physical Science and Engineering Division
Course Number	MSE 200
Course Title	Advanced Engineering Mathematics
Academic Semester	Spring
Academic Year	2017/2018
Semester Start Date	01/28/2018
Semester End Date	05/24/2018
Class Schedule (Days & Time)	10:30 AM - 12:00 PM 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)	Upon appointment
Aurelien Christophe Francois M. Manchon	aurelien.manchon@kaust.edu.sa	+966128084410	3232, 3, Ibn Sina (bldg. 3)	Upon appointment

Teaching Assistant(s)	
Name	Email

Course Information	
Comprehensive Course Description	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.
Course Description from Program Guide	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.
Goals and Objectives	At the end of this class, the student should be able to <ul style="list-style-type: none"> -Objective 1: use standard mathematical tools common to engineers -Objective 2: solve linear systems using matrices -Objective 3: solve standard ODEs and PDEs of interest to materials science -Objective 4: analyze statistical sets of data using standard mathematical concepts
Required Knowledge	Standard undergraduate Math.
Reference Texts	Advanced Engineering Mathematics, Erwin Kreyszig, Wiley; 10 edition (August 16, 2011) ISBN-13: 978-0470458365; ISBN-10: 9780470458365
Method of evaluation	10.00% - Attendance and Participation 30.00% - Presentation 30.00% - Midterm exam 30.00% - Final exam

Nature of the assignments	The students will be requested to prepare series of problems and present their solution in class.
Course Policies	The students are expected to attend all classes and to submit the homeworks on time. No deadline extension will be granted.
Additional Information	

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Sun 01/28/2018	Differentiation and integration
1	Tue 01/30/2018	Differentiation and integration
2	Sun 02/04/2018	Differentiation and integration
2	Tue 02/06/2018	Differentiation and integration
3	Sun 02/11/2018	Differentiation and integration
3	Tue 02/13/2018	Differentiation and integration
4	Sun 02/18/2018	Taylor's expansion
4	Tue 02/20/2018	Taylor's expansion
5	Sun 02/25/2018	Taylor's expansion
5	Tue 02/27/2018	Fourier transform
6	Sun 03/04/2018	Fourier transform
6	Tue 03/06/2018	Fourier transform
7	Sun 03/11/2018	Linear systems resolution
7	Tue 03/13/2018	Linear systems resolution
8	Sun 03/18/2018	Midterm
8	Tue 03/20/2018	Matrix formalism
9	Sun 03/25/2018	Matrix formalism
9	Tue 03/27/2018	Matrix formalism
10	Sun 04/01/2018	Spring break
10	Tue 04/03/2018	Spring break
11	Sun 04/08/2018	Matrix formalism
11	Tue 04/10/2018	Matrix formalism
12	Sun 04/15/2018	Partial differential equations
12	Tue 04/17/2018	Partial differential equations
13	Sun 04/22/2018	Partial differential equations
13	Tue 04/24/2018	Partial differential equations
14	Sun 04/29/2018	Partial differential equations
14	Tue 05/01/2018	Partial differential equations
15	Sun 05/06/2018	Statistics and probability
15	Tue 05/08/2018	Statistics and probability
16	Sun 05/13/2018	Statistics and probability
16	Tue 05/15/2018	Statistics and probability
17	Sun 05/20/2018	Final exam
17	Tue 05/22/2018	End of the class

Note

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