KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

Department of Mathematics & Statistics

Math 208 Course Syllabus
Term – 201

Coordinator: Prof. A. Mimouni (amimouni@kfupm.edu.sa)

Course Title: Math 208 (Introduction to Differential Equations and Linear Algebra)

Credits: 3-0-3

Textbook: Differential Equations and Linear Algebra, C.H. Edwards and D.E. Penny, Prentice Hall, Third Edition (2014)

Objectives: The course introduces elementary differential equations and linear algebra to students of Computer Science, Computer Engineering, System Engineering and Earth Science

Learning Outcomes: Upon successful completion of this course, a student should be able to:

- Find bases of vector spaces.
- Use linear algebra in systems of linear equations.
- Solve eigenvalue problem.
- Perform diagonalization and compute the Jordan form of matrices.
- Solve first order differential equations and related models.
- Solve linear ordinary differential equations.
- Solve systems of ordinary differential equations.

The Course Grading Policy:

Type of Assessment	Date	Time	Percentage	Material
Online Assessment 1	**Thursday 1/10/2020**	7:00 - 9:00 PM	15% (45pts)	**Sections: 2.1 - 2.7**
Midterm	**Thursday15/10/2020**	7:00 - 9:00 PM	15% (45pts)	**Sections:2.8, 3.1- 3.4**
Online Assessment 2	**Thursday 5/11/2020**	7:00 - 9:00 PM	15% (45pts)	**Sections: 3.5 - 3.10**
Quiz 1	**Thursday 17/09/2020**	7:00 -7:20 PM	5% (15pts)	**Sections 1.1 - 1.5**
Quiz 2	**Thursday 08/10/2020**	7:00 -7:20 PM	5% (15pts)	**Sections 4.1- 4.4**
Quiz 3	**Thursday 19/11/2020**	7:00 -7:20 PM	5% (15pts)	**Sections 7.3, 6.2, 6.3**
HW Quiz 1	**Thursday 08/10/2020**	7:25 -7:45 PM	5% (15pts)	**Sections 1.1 – 5.1**
HW Quiz 2	**Thursday 03/12/2020**	7:00 -7:20 PM	5% (15pts)	**Sections 5.2 – 8.1**
Attendance			5% (15pts)	
Final			25% (75pts)	
Total			100%(300pts)	

Passing Grade:

A student should achieve at least 50% (150 Points) to pass this course.

Exam Questions:
Questions of the common exams are based on examples, homework problems and exercises in the textbook.

Missing online assessment:
No make-up will be given under any circumstance. In case, a student misses any online assessment or a legitimate reason (such as medical emergencies), his grade for this assessment will be determined based on the existing formula which depends on his performance in the other assessments.

Attendance:
Attendance is a University Requirement (see p. 38 of the Undergraduate Bulletin 2006-2009). A DN grade will be awarded to any student who accumulates 09 unexcused absences.

Academic Integrity:
All KFUPM policies regarding ethics apply to this course.

Pacing Schedule

W	Date	Section	Topic	Suggested Homework
1	August 30 –Sep. 03	1.1 1.2	Differential Equations & Math. Models (Only Decay & Growth) Integrals as General & Particular Solutions	2,6, 8,10,14,20,35,38 2, 4, 6, 8, 11, 17
2	Sep. 06 – 10	1.4 1.5	Separable Equations (Without Applications) Linear First Order Equations	2, 8, 10, 24, 26, 34,40
3	Sep. 13 – 17	1.5 1.6	Linear First Order Equations (Cont.) Substitution Methods & Exact Eqs. (Only Exact Eqs)	2, 8, 10, 21, 28, 32
			Online Quiz 1: Thursday September 17, 2020 **Material: 1.1 up to 1.5**	
4	Sep. 20 – 24 **23-24 National holydays**	1.6 3.1-3.6 3.6	Substitution Methods & Exact Eqs (Only Exact Eqs.) Review only: Linear Systems, Matrices & Gaussian Elimination, Reduced Row-Echelon Form, Matrix Operations, Inverse Matrices, Determinants Inverse & the Adjoint Matrix	32, 36, 40, 42 Sec 3.1: 4, 13, 18, 24, 28 Sec 3.2: 2, 10, 15, 28 Sec 3.3: 2, 6, 10, 26, 28 Sec 3.4: 1, 10, 14, 25 Sec 3.5: 3, 8, 23 Sec 3.6: 2,7,17,21 33, 38
5	Sep. 27 – Oct. 01	4.1 4.2 4.3	The Vector Space R^3 The Vector Space R^n & Subspaces Linear Combination & Independence of Vectors	1, 4, 6, 8, 10, 16, 19, 20 2, 8, 12, 14, 17, 26 2, 6, 12, 17, 25
			Online Assessment 1: Thursday October 1, 2020 **Material: 1.1 up to 1.6**	
6	Oct. 04 – 08	4.4 4.5 5.1	Bases & Dimension for Vector Spaces Row & Column Spaces Introduction: Second Order Linear Equations	2, 9, 12, 13, 16, 23 1,4,8,12,14,16 2, 10, 15, 19, 26, 28, 43
			Online Quiz 2: Thursday October 08, 2020 **Material: 4.1 up to 4.4** **HW Quiz 1: Thursday October 08, 2020** **Material: 1.1 up to 5.1**	
7	Oct. 11 – 15	5.2 5.3	General Solutions of Linear Equations Homogeneous Eqs. With Constant Coefficients	3, 9, 14, 22, 26 3,4,14,19,22,28,31,33,39
8	Oct. 18 – 22	5.5 5.5	Nonhomogeneous Eqs. & Undetermined Coefficients Method of Variation of Parameters	1, 4, 8, 16, 21, 27, 42, 44 48, 52, 57, 58, 62
			Med-Term Exam: Thursday, October 15, **Material: 1.1 up to 5.3**	
9	Oct. 25 – 29	7.1 7.2	First Order Systems & Applications Matrices & Linear Systems	1,3,8,14,20,21 1, 6, 12, 16, 20, 24
10	Nov. 01 – 05	6.1 7.3	Introduction to Eigenvalues The Eigenvalue Method for Linear Systems	3, 7, 14, 25,31
			Online Assessment 2: Thursday November 5, 2020 **Material: 5.5 up to 6.1**	

11	Nov. 08 – 12	7.3 6.2	The Eigenvalue Method for Linear Systems (Cont.) Diagonalization of Matrices	1, 3, 9, 18, 25, 26 2, 10, 15, 18, 27
12	Nov. 15 – 19	6.3 7.5	Only The Caley Hamilton Theorem Multiple Eigenvalue Solutions	2, 15, 18, 22
			Online Quiz 3: Thursday November 19, 2020 **Material: 7.3, 6.2 and 6.3**	
13	Nov. 22 – 26	7.5	Multiple Eigenvalue Solutions (Cont.) Jordan Normal Form	4, 9, 13, 16, 25, 28, 31 38, 40, 43
14	Nov. 29 –Dec. 03	8.1 8.2	Matrix Exponentials & Linear Systems Nonhomogeneous Linear Systems (Only Variation of Parameters Method)	2, 6, 10, 24, 26
			HW Quiz 2: Thursday December 03, 2020 **Material: 5.2 up to 8.1**	
15	Dec. 06 – 10	8.2	Nonhomogeneous Linear Systems (Cont.)	17, 19, 26, 32
16	Dec. 13-14		Catch-up and Review	
Final Exam:			**TBA, 16-28 December, 2020**	