End of Semester Report

for

MAT 260 Ordinary Differential Equations and Series Solutions

Fall 2017

MW noon-1:50 PM, DON G 244

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Office Hours

Monday	10:30 -11:15 AM	and	2:15 - 3:00 PM
Wednesday	10:30 -11:15 AM	and	2:15 - 3:00 PM

And by appointment

Snowline: In case of inclement weather dial the Snowline, 792-7385, to inquire about cancelled classes.

TEXTBOOK: ***Fundamentals of Differential Equations by Nagle, Saff and Snider***, 8th ed, Pearson, 2011

DESCRIPTION: The course will allow student to become familiar with the subject of differential equations. It covers methods of solutions such as: separation of variables, integrating factor, reduction of order. Differential equations with constant and variable (Cauchy-Euler) coefficients are treated as well as series solutions of differential equations are introduced (method of Frobenius, Bessel and Legendre equations). Laplace transform and systems of linear first order equations are covered. Examples of applications of differential equations in physics, engineering are given.
PREREQUISITE: MAT 152 Calculus 2 with grade C or better, or equivalent

Student oriented objectives:
Upon completion of the course the student will be able to
SLO1: Classify differential equations with respect to order, linearity and homogeneity
SLO2: Solve and interpret the initial value problems
SLO3: Use the appropriate method of solution to 1st order equations
SLO4: Use the appropriate method of solution to 2nd order and higher order equations, depending on the type of the equation
SLO5: Seek solutions of differential equations in the form of infinite series
SLO6: State and Explain the concept/definition of Bessel functions and Legendre polynomials as they arise in the context of ODEs
SLO7: Apply Laplace transform method for solving differential equation where applicable
SLO8: Perform elementary operations with matrices, compute determinants and solve linear equations using Gaussian elimination
SLO9: Solve systems of linear 1st order differential equations using eigenvalue/eigenvector approach

SLO10:Solve selected modeling problems such as: population modeling, radioactive decay, mixtures, mechanical and electrical oscillations

NOTES

Total students registered in class: 22
Students who withdrew with W grade: 5
Number of students which received grades are part of this assessment: 17

Two students stopped participating in classes by end of March but never officially withdrew from the class. Their record is part of this assessment report.

Student Learning Outcome		Measure used	# of students not meeting expectations	#of students meeting expectations	#of students exceeding expectations	ACTION TO CONSIDER
SLO1		Homework 1 Homework 3 Exam 1	0	10	7	None
SLO2		Homework: 2,3,4,7,8 Exam1	0	1	16	None
SLO3		Homework1 Homework 2 Exam 1	0	9	8	None
SLO4		Homework 4 Homework 5 Exam 1	1	4	12	None
SLO5		Homework 9 Homework10 Exam 2	0	7	10	None
SLO6		Exam 2	0	11	6	None
SLO7		Homework6 Homewokr7 Homewokr8 Exam2	1	6	10	None
SLO8		Homework10 Homework11 Homework12 Final Exam	0	8	9	None
SLO9		Homework10 Final Exam	0	3	14	None
SLO10		Homework 3 Exam1 Homework	1	7	9	None

Additional comments:
High number of students that withdrew (5 from original 22 students) confirms the impressions from the first half of the semester that this particular group of students was very unprepared. Their elementary differentiation and integration skills, manipulations of exponential and logarithmic functions and general algebra skills were very poor as documented by the diagnostic quiz (not part of the evaluation) given in the second week of the semester. Students that reminded in class had either better preparation and/or worked very hard to remedy the deficiencies.

Hyperbolic functions (sinh x, cosh x) remains a concern: While the knowledge of hyperbolic functions is not crucial for success in the class, it is assumed that students are familiar with the concept. We were discussing hyperbolic functions in class during topics of series solutions and Laplace transform. Majority of students says that they have not encountered these functions prior to MAT 260 class.

General comments – long range planning discussion
If the student population will tend to favor Mechanical and Civil engineers together with Applied mathematics majors, but not Electrical Engineers, then the topic of Laplace Transform could be possibly shortened and allow more emphasis on systems and applications. Another topic for discussion is whether the Linear Algebra should/can be considered as co-requisite/prerequisite. Course is trying to be serve 3 different engineering majors as well as mathematics major. Assure broad range of topics for all those needs sometimes does not allow for the depth in some topics one would wish for.