University of Salahaddin – College of engineering – Civil engineering Department

Module Name	Engineering Analysis			Course Status	Core
Frequency	Yearly in fall semester	Code	111	Credit point	5
Duration:	15 week – 1 semester			Module Language	English
Pre-requisites	Mathematics III			Required Level	

Course Description	A comprehensive course to familiarize engineering professionals with advanced applied mathematics as it relates to solving practical engineering problems. The course of intensive study blends the theoretical underpinnings of advanced applied mathematics with an understanding of how these powerful tools can be used to solve practical engineering problems. The material covered includes application of Differential Equations; Laplace Transforms; Fourier series and their application; Heat and Wave equation; Fourier transform, Z- Transform.
Course Objectives	The objective of the course, is to introduce fundamental mathematical concepts and their practical applications primarily to civil engineering students. The main idea behind this subject is the development of the student's ability to use mathematics with understanding to solve engineering problems. Recognizing the increasing importance of mathematical modelling in engineering practice, many of the worked examples and exercises incorporate mathematical models that are designed both to provide relevance and to reinforce the role of mathematics in various branches of engineering, which are seen as essential if engineers are to tackle the increasingly complex systems that are being called upon to analyze and design
Learning Outcome	At the end of the semester, students would be able to use mathematics with understanding to solve engineering problems and recognize the increasing importance of mathematical models in engineering practice. The student will get familiar to use Laplace Transform to simplify calculations in system modeling, where a large number of differential equations are used. Also, they will get to know better analyze a signal in another domain rather than in the original domain by using the Fourier series, which allows us to model any arbitrary periodic signal with a combination of sines and cosines.
Literature & text Books	1- Advanced Engineering Mathematics by Erwin Kreyszic, 10th edition, 2011, John Wiley & Sons. 2- Modern Engineering Mathematics by Glyn James, Fifth Edition, 2015.

Type of Teaching	Theory Lectures	Tutorial	Practical
	3 hr	1 hr	0 hr

Evaluation Profile	Students are required to first midterm exam on 8 week, class room activities, quizzes, home works and final exam on week 15th. So that the final grade will be based upon the following criteria:		
	Course period efforts (out of 40%)	Midterm Exam (90 min written exam at week 8)	20 %
		Short exams (Quiz)	12 %
		Class Room Activities	8 %
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	Final Course Exam (out of 60%)	Written exam (120 min written exam week 15)	60 %
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Work load:	Total Work Load 135 hr	Class Attendence 60 hr	Self Studies 75 hr