H-Form ISE 342

Course Information:	
Code and Title:	ISE 342 Regression and Forecasting
Prerequisites:	MATH 353 + MATH 265
Co requisite (if any)	-
Credit Hours: 3	Lecture Hrs. (30), Tutorial Hrs. (15), Lab (15), **Total Credits** (60)
College/ Department:	College of Engineering/Industrial and Systems Engineering

Course Description:

This course covers a range of topics in regression analysis and time series modeling. Beginning with simple linear regression and progressing to multiple linear regression, it delves into techniques such as the least squares estimate of parameters, hypothesis testing, and confidence intervals within linear regression models. It then explores testing of models, assessing data analysis, and determining model appropriateness. Moving into time series models, the course addresses linear time series models, including moving average, autoregressive, and ARIMA models. Students learn about estimation, data analysis, and forecasting within these models, along with exponential smoothing techniques and the assessment of forecasting errors and confidence intervals.

Course Objectives:

This course will enhance the students' understanding the regression and forecasting models and their applications in various fields of science and engineering. Along with formulating real life problems using regression and forecasting models. Also, it will result in using relevant statistical tools for model evaluation and choosing the appropriate models for analysis effectively. Moreover, students will be able to use statistical software to estimate the models

Course Learning Outcomes

		PLO
Knowledge Understanding		
1.1	Identify different regression methods for forecasting	K2
1.2	Recognize the difference between time series forecasting and causal (regression) forecasting to solve time series problems.	K3
Skills		
2.1	Collect appropriate data, draw conclusions and develop solutions from the estimated models.	S1
2.2	Apply forecasts using various methods, tools, and measure forecast accuracy.	S2
2.3	Use statistical software to estimate the models from real data.	S2
2.4	Formulate real-life problems using regression and forecasting models.	S3
Values		
3.1	Participate effectively in a team to formulate a real-life (case study) problem model and suggest the solution by applying lessons of Regression and Forecasting	V1

Textbook:			
Title:	Introduction to Time Series Analysis and Forecasting		
Author(s):	Douglas C. Montgomery, Cheryl L. Jennings, Murat Kulahci,		
Publisher:	Wiley	**Year and Edition:**	2008
Other Useful Resources:	Statistics for Business and Economics, James T. McClave, P. George Benson, Terry Sincich, Pearson, 13th Edition, 2017 Forecasting, Time Series, and Regression, Bruce L. Bowerman, Richard O'Connell, Anne Koehler, Cengage Learning, 4th Edition, 2005		