ENGM 535 Analytics for Engineering Managers

Course Description

This course equips engineering managers with the necessary analytical tools and methodologies to make informed decisions and boost operational efficiency. It integrates principles of data and statistical analysis, data management, and predictive modelling, with a focus on their application in operational research and addressing engineering management challenges.

Course Learning Outcomes

By the end of the course, students will be able to:

1. Demonstrate extensive and detailed knowledge and understanding of analytics, data science, and artificial intelligence.
2. Apply one or more advanced data analytics technique to research and investigate engineering management problems.
3. Demonstrate professional judgment in an engineering project scenario based on analytics.
4. Use professional-level skills to effectively communicate analytical findings—both orally and in writing—to peers, colleagues, or specialists.
5. Initiate and lead a strategically analytical decision to solve or improve an engineering project outcome.

Learning Resources

Sharda, R., Delen, D., & Turban, E. (2021). Analytics, Data Science, & Artificial Intelligence: Systems for Decision Support (12th ed.). Pearson.

Course Content

1. Overview of Business Intelligence, Analytics, Data Science, and Artificial Intelligence: Systems for Decision Support & Ethical Impacts.
2. Artificial Intelligence: Concepts, Drivers, Major Technologies, and Business Applications Nature of Data
3. Introduction to regression and overfitting in statistics and data mining.
4. Statistical Modeling, and Visualization
5. Predictive Analytics Techniques
6. Machine-Learning Techniques Understand different types of ensemble models and their pros and cons in predictive analytics SVM, kNN, Naïve Bayes algorithm
7. Training the SVM
8. Training Decision trees
9. Training of ANN to create a prediction model.
10. Understand different types of ensemble models and their pros and cons in predictive analytics
11. Deep Learning. Knowledge Systems: Expert Systems.
12. Prescriptive Analytics: Optimization and Simulation