

EMBRY-RIDDLE AERONAUTICAL UNIVERSITY
Department of Computing and Mathematics
COURSE OUTLINE FOR

Course No.: MSE585

Title: Metrics and Statistical Methods for Software Engineering

Cr Hrs: 1

Lecture Hours: 1

Laboratory Hours: 0

COURSE DESCRIPTION:

This course is concerned with the three related topics of software measurement, statistical tools and methods, and applied experimental design in software engineering. Students will be introduced to the principles and concepts relevant to measurement in software engineering including the representational theory of measurement, collection, analysis, and validation of data. Also studied are frameworks, such as Goal-Question-Metrics and Quality Function Deployment paradigms, for guiding measurement efforts. Statistical methods along with Statistical Process Control (SPC) tools such as Control Charts, Fishbone Diagrams, Scatter Diagrams and advanced subjects such as Experimental Design techniques and their application in software engineering are covered. Also explored are the concepts of analysis of experiments, model building, ethics and presentation of experiments. Prerequisite:

GOALS:

This course is intended to provide students with the measurement foundations and experience necessary for study and research in software engineering, with specific emphasis on software metrics and statistical techniques.

PERFORMANCE OBJECTIVES:

1. Identify the fundamental of software measurement.
2. Describe the tools, techniques, and methodologies related to software measurement.
3. Design an experiment to collect software measurement data.
4. Collect data, validate it, interpret it, and report the results of an experiment.
5. Demonstrate the process of implementing measurement groups.
6. Plan and implement a software measurement program on a small software development project.
7. Appreciate the importance of software metrics and its application in software engineering.
8. Appreciate and honor ethical issues related to metrics.

Department of Computing and Mathematics
COURSE OUTLINE FOR MSE585, Continued

TEXTBOOK:

Fenton and Pfleeger, *Software Metrics: A Rigorous and Practical Approach*, 2nd Edition.

SUGGESTED SUPPLEMENTAL MATERIALS:**PREREQUISITE KNOWLEDGE BY TOPIC: Software Engineering Discipline**

TOPIC	CLASS HOURS	COURSE OBJECTIVES
1. Introduction		Identify the fundamental of software measurement
2. Measurement		Describe the tools, techniques, and methodologies related to software measurement
3. Representational Theory of Measurement		Describe the tools, techniques, and methodologies related to software measurement
4. Resource Measurement		Design an experiment to collect software measurement data.
5. Empirical Investigation		Collect data, validate it, interpret it, and report the results of an experiment
6. Software Metrics Data Collection		Collect data, validate it, interpret it, and report the results of an experiment
7. Analyzing Software Measurement Data		Collect data, validate it, interpret it, and report the results of an experiment
8. Multi-Criteria Decision Aids		Collect data, validate it, interpret it, and report the results of an experiment
9. Measuring Internal Product Attributes		Plan and implement a software measurement program on a small software development project.
10. Measuring External Product Attributes		Plan and implement a software measurement program on a small software development project.

LABORATORY:

None

COMPUTER USAGE:

Occasional use as a learning tool in the classroom.

GRADING SYSTEM:

ESTIMATED CONTENT:

Skills:	40%
Content:	60%