COLLEGE OF ENGINEERING AND APPLIED SCIENCE

Contents

Department of Computer Science

Computer Science, MS
Updated: Fall 2016
Chair: Ed Chow
Program Assessment Coordinator: Rory Lewis

Part One: Assurance of Student Learning Plan

Mission Statement

The College of Engineering and Applied Science aspires to improve health, welfare, and prosperity through technical learning, research, professional practice, and invention.

Teaching Goals

TG1. Illuminate
While sustaining academic quality and integrity, increase, at a responsible rate, the number of students in EAS programs who are passionate about life-long learning and who are knowledgeable and competitive in the global marketplace throughout their careers.

TG2. Investigate
Provide adequate support and incentives to increase, at a reasonable rate, recognized and relevant research that has both local and global impact.

TG 3.   Innovate
Develop practices, policies and incentives to support a reasonable increase in activities leading to economic and technology development that improves health, welfare, and prosperity through engineering.

Program Student Learning Outcomes

Departmental statement: Learning outcomes include being able to adapt one's knowledge developed in the department to code in a variety of languages, on a variety of platforms in a variety of condtions.

PSLO1. A broad knowledge of computer science, covering a variety of fundamental areas (like operating systems, design and analysis of algorithms and theoretical aspects of computability). This broad background can be a result of a combination of undergraduate and graduate course work.

PSLO2. Ability to read, understand and evaluate professional literature computer science.

PSLO3. Ability to write technical reports and software project documentation.

PSLO4. Ability to make oral presentations of technical information.

PSLO5. In-depth knowledge of at least one area of computer science, including the topic of the candidate's thesis or project.

Measures

Part I. Thesis Defense, Coding

Part II. Thesis Defense, Presentation

Exit Survey

Part Two: 2016-2017 data will be submitted in the spring of 2017

Game Design and Development, BI
Updated: Fall 2014
Chair: Joe Zhou
Program Assessment Coordinator: Tim Chamillard

Part One: Assurance of Student Learning Plan

Mission Statement

The Bachelor of Innovation TM in Game Design and Development is designed to provide students with the technical and business skills required to form successful indie game development companies. Technical material is focused on programming skills and game design fundamentals and application, with the business component of the degree provided by the Bachelor of Innovation TM core courses. Those students who decide not to form their own game development companies will have the necessary competencies required to get employment as programmers in existing game or non-game companies.

Teaching Goals

TG1. Graduates demonstrate the ability to apply core programming concepts to develop games

Programming is the core competency required to make game design ideas tangible. This goal addresses our need to teach our students both programming basics and more sophisticated programming techniques required to build commercial games. Because of its importance, programming is a continuous activity throughout the course of study.

TG2. Graduates demonstrate the ability to apply game design fundamentals
For this goal, we want to ensure that students understand the fundamentals of game design and are able to apply them in the games they develop. This isn't about the programming part it's about teaching students the fundamental concepts

behind game design. Some example concepts are rules of play (in video games and games in general), play mechanics, and resources and economies.

TG3. Graduates are prepared to apply Innovation Core concepts in a team-based business environment

Because the main purpose of our program is to graduate students who form independent game development companies, getting students ready for business environments is a key goal of our program. Achieving this goal requires that the students explore a number of topics and activities, including (but not limited to) Intellectual Property, business law, innovation, entrepreneurship, and team participation on real-world projects over extended periods of time. The Innovation Core for all Bachelor of Innovation™ degrees is designed to meet this goal.

Program Student Learning Outcomes

PSLO1. Understand and apply programming fundamentals (M1, M5).
This outcome requires that students develop initial programming skills that show they understand and can apply the foundational concepts in game programming. These are, by the way, also the foundational concepts in general computer programming.

PSLO2. Understand and apply advanced software development techniques (M2, M4, M5).
After students reach a level of competence with programming fundamentals, we expect them to extend those fundamentals to application of more advanced programming concepts as they develop their games.

PSLO3. Understand and apply game design principles in various domains (M3, M4, M5).
High-level game domains include, among others, entertainment games, casual games, and serious games. There are typically a variety of genres within each domain as well. We want our students to apply game design principles across a broad spectrum of domains and genres.

Measures

M1. Basic Programming Skill. These are individual game development assignments that the students complete at the start of their course of study.

M2. Advanced Programming Skills. These are individual game development assignments that the students complete later in their course of study. They provide students with some latitude in terms of the constraints placed on the games they develop.

M3. Game Design Fundamentals. This measure is to quantify student understanding of fundamental game design topics

M4. Capstone Project. This is a commercial-quality game students develop as a capstone experience in the GDD program. Students have total freedom to develop a game of their choice, but a solid understanding of game design fundamentals and advanced programming skill are required to develop a game of the appropriate scope and quality.

M5. Exit Interview. These interviews will focus on student self-assessment of their achievement of each of the program objectives. They'll also contain open-ended questions about ways to improve the program.

Part Two: Results of Assessment Activities

PSLO1. Understand and apply programming fundamentals

M1. Basic Programming Skill
Our threshold competency level for this measure is 80% @ 70%+ for overall course percentage. In Spring 2016, we had all 51 of 74 students (69%) with course percentages 70% or higher.

M5. Exit Interview
Our exit interview questions were open-ended rather than asking for a numeric rating as described in our ASLP Summary. We'll be adding numeric rating questions the next time we do the exit interviews. There were no comments on the exit interviews about programming fundamentals.

Summary of findings for PSLO 1 and associated measures:
The findings overall indicate that we're not meeting this PSLO and the measures are providing meaningful data to our department. The GDD 1200 course we use to evaluate basic programming skill historically has a consistently high attrition rate, which is consistent with attrition rates for beginning programming courses in typical computer science programs. Although we've seen a move to a flipped classroom in this course (see discussion about improvements below) yielding improved student learning, it appears that an 80% target is unrealistic for this type of course. Because attrition rates in typical beginning programming courses range from 30-40% according to various sources, we'll change the threshold competency level for this measure to 60% @ 70%+ for overall course percentage for Academic Year 2016-2017 and beyond.

PSLO2. Understand and apply advanced software development techniques

M2. Advanced Programming Skills
Our threshold competency level for this measure is 80% @ 70%+ for overall course percentage. In Spring 2016, we had all 10 of 16 students (63%) with course percentages 70% or higher.

M4. Capstone Project

Our threshold competency level for this measure is 80% @ 70%+ for overall course percentage. In Spring 2016, we had all 12 students with course percentages 70% or higher.

M5. Exit Interview

Our exit interview questions were open-ended rather than asking for a numeric rating as described in our ASLP Summary. We'll be adding numeric rating questions the next time we do the exit interviews. One student commented that they thought the CS 2250 class (the class we use to evaluate advanced programming skills) was too hard.

Summary of findings for PSLO 2 and associated measures

The findings overall indicate that we're partially meeting this PSLO and the measures are providing meaningful data to our department. The Capstone Project measure supports our meeting this PSLO, but the CS 2250 (Advanced Programming Skills) measure is lower than our threshold competency level. To meet that threshold, we would have needed 3 more students to earn a 70% or better in the course. Unfortunately, the 6 students who didn't earn a 70% or better in the course have been consistently under-performing in the GDD courses leading up to CS 2250. The mean for the 10 students who exceeded the threshold was 88%, while the mean for the 6 students who didn't exceed the threshold was 43%. There was a very clear bimodal distribution of student grades in CS 2250. Based on our observations about the CS 2250 grades, we don't plan to make any changes to the course at this time. The group of well-prepared students easily exceeded our threshold competency level, while the group of historically under-performing students missed that threshold by a significant amount.

PSLO3. Understand and apply game design principles in various domains

M3. Game Design Fundamentals

Our threshold competency level for this measure is 80% @ 70%+ for overall course percentage. In spring 2016, we had 24 out of 27 students (89%) with course percentages 70% or higher

M4. Capstone

Our threshold competency level for this measure is 80% @ 70%+ for overall course percentage. In spring 2016, we had all 12 students with course percentages 70% or higher.

M5. Exit Interview

Our exit interview questions were open-ended rather than asking for a numeric rating as described in our ASLP Summary. We'll be adding numeric rating questions the next time we do the exit interviews. Two students commented that our User Interface course was the best GDD course they took; developing an

appropriate user interface is an important game design activity. Two students commented that the GDD 4900 class (the Capstone Project class) was the best GDD course they took.

Summary of findings for PSLO 3 and associated measures

> The findings overall indicate that we're meeting this PSLO and the measures are providing meaningful data to our department.
>
> Based on anecdotal feedback from our GDD 2150 students in Spring 2016, we're planning to modify that course to focus more on game design concepts and less on implementing those concepts. We need to carefully find the appropriate balance with these changes, because a huge part of game design involves prototyping design ideas and evaluating how well they work. Although the measure for that class didn't indicate a weakness, we believe this change will enhance student learning in this area.

Information Assurance, ME
Updated: Fall 2015
Chair: Joe Zhou
Program Assessment Coordinator: Kristen Wolcott-Justice

Part One: Assurance of Student Learning Plan

Mission Statement

> The mission of the Master of Engineering in Information Assurance is to offer the information assurance curriculum for students to study and conduct research in areas of network and system security, which has become very critical and ever increasingly urgent in today's network and information systems. The Information Assurance curriculum includes courses designed to prepare individuals, who engineer computer/network systems or develop policy for these systems, with knowledge of methods, techniques, and tools used in information assurance.

Teaching Goals

TG1. Educate Next Generation of Information Assurance experts to protect national critical information infrastructure.

The faculty of the Master of Engineering in Information Assurance is committed to the development of information assurance experts who are capable of developing and managing secure computer and network systems, ensuring their reliability and performance, and devising the responsive information operation policy. The faculty fully accepts the critical role of mentorship in learning and sharing knowledge with students while challenging them to develop competencies and to advance the intellectual horizon.

Graduates of the program will know and be able to perform to professional standards in the following areas.

- – Broad understanding of the entire spectrum of information assurance;
- – State of art in information assurance techniques and tools;
- – Information protection through cryptographic methods;
- – Design and management of systems from a security viewpoint.

Program Student Learning Outcomes

PSLO1. At the completion of the program, students of the MEIA program will be able to apply the information assurance techniques and tools to build secure network systems and setup/enforce security policies

PSLO2. Graduates of MEIA program can perform risk analysis and penetration testing on network systems.

PSLO3. Graduates of MEIA program can apply the best practices of information assurance to ensuring the security of network systems.

Measures
M1. Master Thesis or Project
M2. Exit Survey

Part Two: 2016-2017 data will be submitted in the spring of 2017

Software Engineering, ME
Updated:Fall 2015
Chair: Joe Zhou
Program Assessment Coordinators: Kristin Wolcott-Justice

Part One: Assurance of Student Learning Plan

Mission Statement

The mission of the Master of Engineering in Software Engineering is prepare students to practice and conduct research in areas of Software Engineering. Complex software intensive systems permeate every aspect of our lives. These systems are at the core of the complex products humankind has ever developed. Software engineering is the disciplined application of proven principles, techniques, and tools to the creation and maintenance of cost effective, user friendly software systems that solve real problems. The Software Engineering curriculum includes courses designed to prepare individuals to engineer complex software systems, develop efficient, reliable, and secure software.

Teaching Goals

TG1. Educate the next generation of software engineering professionals.

The faculty of the Master of Engineering in Software Engineering is committed to the development of software engineering professionals who are capable of developing and managing complex software systems, ensuring their efficiency, reliability, security, and performance. The faculty fully accepts the critical role of mentorship in learning and sharing knowledge with students while challenging them to develop competencies and to advance the intellectual horizon. Graduates of the program will know and be able to perform to professional standards in the following areas. broad understanding across the spectrum of software engineering; state of art software engineering techniques and tools; design and management of large software projects.

Program Student Learning Outcomes

PSLO1. At the completion of the MESE program, students should know the proven principles/techniques/tools, current standards, and best practices of software engineering. They should be prepared to apply that knowledge to manage a medium to large size software project.

PSLO2. At the completion of the MESE program, students should know how to work effectively in a software team for a large software project, either leading the team or contributing as a productive team member.

PSLO3. At the completion of the MESE program, students will know how to communicate effectively and professionally in both group and individual settings.

PSLO4. At the completion of the MESE program, students will understand and be able to apply state of the art Software Engineering Principles and Technology.

Measures
M1. Master Thesis or Project Oral Defense Assessment
M2. Master Thesis or Project Report Assessment
M3. Student Project Portfolio Assessment
M4. Exit Survey

Part Two: 2016-2017 data will be submitted in the spring of 2017

Department of Electrical Engineering

Electrical Engineering, MS
Approved: Fall 2015
Chair: T.S. Kalkur
Program Assessment Coordinator: T.S. Kalkur

Part One: Assurance of Student Learning Plan

Mission Statement

In partnership with the community and our alumni, the mission of the Department of Electrical and Computer Engineering is to.

- Illuminate. Inspiring a passion in our students for life-long learning; and graduating engineers and scientists who are lnowledgeable and competitive in the global marketplace throughout their careers.

- Investigate. Conducting recognized and relevant research that has both local and global impact.

- Innovate. Engaging in leadership, service, economic and technology development that improves health, welfare, and prosperity through engineering.

Teaching Goals

TG1. Students are expected to learn new and emerging engineering technologies and pursue research and technology careers, including but not limited to technical development, project management, and technical sales.

TG2. Students should demonstrate the ability to find and access information relevant to an application under development and have the ability to understand and approach various engineering problems and convert their solutions into engineering products.

TG3. Students should apply the theory and techniques of electrical engineering to innovative real-world solutions.

Program Student Learning Outcomes

PSLO1. Read, interpret, and critically assess literature in electrical engineering and evaluate the impact on current issues in electrical engineering and society (M1, M2, M3, and M4)

PSLO2. Writing and Oral Communication Skills. Write technical reports and other documentation and to present oral reports of a technical nature (M1, M2, M3)

PSLO3. Technical Oral Presentations. Be able to give acceptable oral presentations of a technical nature (M1, M3)

PSLO4. Apply Basic/Advance Knowledge in Science. Be able to apply basic and advanced knowledge in science, mathematics, and engineering disciplines to perform analysis and synthesis of engineering problems. Writing and Oral Communication Skills (M2, M3, M4).

Measures

M1.   Thesis-written. Student distributes a written thesis/report and orally presents the thesis/report to a committee of graduating faculty members; the evaluation form is completed by all graduate faculty members in attendance at the presentation.

M2.   Thesis-oral. Thesis committee completes this questionnaire during the thesis/report or project presentation

M3.   Exit Questionnaire. Upon successful completion of the oral defense the graduating student will be asked to complete an Exit Questionnaire.

M4.   Alumni Survey.

Part Two: Results of Assessment Activities

PSLO1. Read, interpret, and critically assess literature in electrical engineering and evaluate the impact on current issues in electrical engineering and society.

M1.   Thesis-written.
The average score for 16 students for a question on "What is the degree of originality of the thesis/report?" was 4.74 on a scale with a maximum score of 6. The rating exceeds standards. The average score for a question on "Are there adequate references" was 4.95 on a scale with a maximum score of 6. The rating was exceeds standards.

M2.   Thesis- oral
The average score for a question on "Did the presentation answer all relevant questions" is 5.13 in a scale with maximum score of 6. The rating was excellent.

The average score for a question on "Did the presentation cover all the valid points in detail "is 5.01 on a scale with a maximum score of 6. The rating was excellent.

M3. Exit Questionnaire
The average score for a question on "Were the library facilities are adequate" the average score was 5.43 on a scale with a maximum score of 6. The rating was excellent.

Summary of findings for PSLO 1 and associated measures

> The assessment scores indicate that the program is getting an exceeds standards/excellent rating from faculty and students in meeting this outcome

PSLO2. Writing and Oral Communication Skills: Write technical reports and other documentation and to present oral reports of a technical nature.

M1.   Thesis-written

For a question on "Is the thesis/report well written", the average score was 4.61 on a scale with a maximum score of 6. The rating was exceeds standards.

For a question on "Is the thesis/report self-contained, the average score was 5.1 on a scale with a maximum score of 6. The rating was excellent.

M2.   Thesis- oral

For a question on "Is the presentation content relevant to the topic", the average score was 5.12 on a scale with a maximum score of 6. The rating was excellent.

For a question on "Did the presentation cover all the valid points in detail", the average score was 5.02, on a scale with a maximum score of 6. The rating was excellent.

Summary of findings for PSLO 2 and associated measures

> The rating of the thesis/report writing exceeds standards. However, the department intends to achieve excellent ratings in this area. The department has a significant number of international students that are encouraged to consult with the UCCS writing center to improve their writing skills.

PSLO3. Technical Oral Presentations: Be able to give acceptable oral presentations of a technical nature.

M2.   Thesis- oral

For the question on "Is the presentation coherent and well organized", the average score was 5.2 on a scale with a maximum score of 6. The rating was excellent.

For the question on "Was the length of presentation appropriate", the average score was 5.1 on a scale with a maximum score of 6. The rating was excellent.

For the question on "Was the presenter enthusiastic "the average score was 5.3 on a0 scale with a maximum score of 6. The rating was excellent.

M3. Exit Questionnaire

For the question on "Did you obtain enough guidance from your adviser", the average score was 5.5 on a scale with a maximum score of 6. The rating was excellent.

Summary of findings for PSLO 3 and associated measures

> The rating for Technical and Oral presentations is excellent from faculty and students. Faculty take a lot of interest in training students for presentations before they present their thesis/reports.

PSLO4. Apply Basic/Advance Knowledge in Science: Be able to apply basic and advanced knowledge in science, mathematics, and engineering disciplines to perform analysis and synthesis of engineering problems.

> M1.   Thesis-written.
> For a question on "Did the presenter answer all the relevant questions", the average score was 5.01 on a scale with a maximum score of 6. The rating was excellent.

> M2.   Thesis- oral.
> For a question on "What is the contribution level to engineering field", the average score was 4.64 on a scale with a maximum score of 6. The rating was exceeding expectations.

> For a question on "Did the student exhibit independent thinking", the average score was 4.9, on a scale with a maximum score of 6. The rating was exceeding expectations.

> M3. Exit Questionnaire.
> For a question on "Was your course work relevant and useful, the average score was 5.21, on a scale with a maximum score of 6. The rating was excellent.

> For a question on "Did your coursework prepare you to perform research/report", the average score was 5.4 on a scale with a maximum scale of 6. The rating was excellent.

Summary of PSLO 4 and associated measures

> ECE faculty places great emphasis on students' understanding of basic and advanced knowledge in science, math and engineering disciplines in solving engineering problems. Although faculty and student responses exceed expectations in this category, faculty are working hard in introducing new topics in their courses so that students contribute original contributions by developing independent thinking skills.

Department of Mechanical and Aerospace Engineering

Mechanical and Aerospace Engineering, MS
Submitted: Fall 2016
Chair: Peter Gorder
Program Assessment Coordinator: Peter Gorder

Part One: Assurance of Student Learning Plan

Mission Statement

In partnership with the community and our alumni, the mission of the Department of Mechanical and Aerospace Engineering is to.

Illuminate. Inspiring a passion in our students for life-long learning; and graduating engineers and scientists who are knowledgeable and competitive in the global marketplace throughout their careers.

Investigate. Conducting recognized and relevant research that has both local and global impact.

Innovate. Engaging in leadership, service, economic and technology development that improves health, welfare, and prosperity through engineering

Teaching Goals

TG1. Students are expected to learn new and emerging engineering technologies and pursue research and technology careers, including but not limited to technical development, project management, and technical sales.

TG2. Students should demonstrate the ability to find and access information relevant to an application under development and have the ability to understand and approach various engineering problems and convert their solutions into engineering products

TG3. Students should apply the theory and techniques of mechanical and/or aerospace engineering to innovative real-world solutions.

Program Student Learning Outcomes

PSLO1. Read, interpret, and critically assess literature in mechanical and/or aerospace engineering and evaluate the impact on current issues in mechanical and/or aerospace engineering and society. (M1, M2, M3 and M4)

PSLO2. Writing and Oral Communication Skills. Write technical reports and other documentation and to present oral reports of a technical nature. (M1 and M3).

PSLO3. Technical Oral Presentations. Be able to give acceptable oral presentations of a technical nature. (M1 and M3)

PSLO4. Apply Basic/Advance Knowledge in Science. Be able to apply basic and advanced knowledge in science, mathematics, and engineering disciplines to perform analysis and synthesis of engineering problems.Writing and Oral Communication Skills (M1 and M4)

Measures

M1.   Thesis Evaluation. Student distributes a written thesis/report and orally presents the thesis/report to a committee of graduate faculty members; the evaluation form is completed by student's thesis committee members in attendance at the presentation.

M2.   Project 1 in both MAE 5011 & MAE 5012 - one of these required for all MS Students

M3.   MSME Exit Questionnaire. Upon successful completion of the oral defense the graduating student will be asked to complete an Exit Questionnaire.

M4.   Alumni Survey. An Alumni survey

Part Two: 2016-2017 data will be submitted in the spring of 2017

Online Masters of Engineering Programs

Energy Engineering, ME
Updated: Fall 2016
Chair: Chris Nelson
Program Assessment Coordinator: Chris Nelson

Part One: Assurance of Student Learning Plan

Mission Statement

In partnership with the community and our alumni, the mission of the Department of Mechanical and Aerospace Engineering is to.

Illuminate. Inspiring a passion in our students for life-long learning; and graduating engineers and scientists who are knowledgeable and competitive in the global marketplace throughout their careers.

Investigate. Conducting recognized and relevant research that has both local and global impact.

Innovate. Engaging in leadership, service, economic and technology development that improves health, welfare, and prosperity through engineering

In this context, the purpose of the Master of Engineering programs in Systems Engineering, Engineering Management, Energy engineering and Space Operations, is to prepare students for successful careers, and ensure that students have a strong foundation in engineering science and modern computational methods that they can apply to solving real world engineering problems. To achieve these goals, we will educate students in the skills and knowledge required to formulate and solve problems, help them to develop their creativity, engineering, intuition, and teamwork skills.

Teaching Goals

TG1.   Understanding of energy systems in the built environment

TG2.   Proficiency with tools and techniques to analyze the technical and financial performance of energy systems

TG3.   Understanding of alternative energy systems

Program Student Learning Outcomes

PSLO1. Demonstrate the ability to analyze the energy systems of a current operational environment (M1, M2, M3).

PSLO2. Demonstrate the ability to recommend improvements and enhancements to existing energy systems (M1, M2, M3).

PSLO3. Demonstrate the ability to quantify energy consumption and costs (M1, M2 and M3).

PSLO4. Demonstrate the ability to recommend alternative energy solutions (M1, M2, and M3).

Measures
M1.   ME-ENE Capstone Project
M2.   ME-ENE Exit Survey
M3.   ME.ENE Faculty/Course Evaluation

Part Two: 2016-2017 data will be submitted in the spring of 2017

Engineering Management, ME
Updated: Fall 2016
Chair: Chris Nelson
Program Assessment Coordinator: Chris Nelson

Part One: Assurance of Student Learning Plan

Mission Statement
The mission of the College of Engineering and Applied Science is to. Illuminate. Inspire a passion in our students for life-long learning; Investigate. Conduct recognized and relevant research that has local and global impact; Innovate. Engage in leadership, service, economic and technology development that improves health, welfare, and prosperity through engineering. In this context, the purpose of the Master of Engineering programs in Systems Engineering, Engineering Management, and Space Operations, is to prepare students for successful careers, and ensure that students have a strong foundation in engineering science and modern computational methods that they can apply to solving real world engineering problems. To achieve these goals, we will educate students in the skills and knowledge required to formulate and solve problems, help them to develop their creativity, engineering intuition, and teamwork skills.

Teaching Goals
TG2.   ME Engineering Management program graduates will know and be able to perform in the following areas. 1)Systems engineering life cycle process 2) Finance and account principals applied to executive decision-making 3) Leadership and management skills for a rapidly changing technological world 4) Graduate level study in an applicable science and engineering discipline.

Program Student Learning Outcomes
PSLO1. Apply the fundamental principles of engineering to the management of technology-based programs. Apply individual, group and organizational dynamics to the challenges of managing in the operation of today's rapidly changing technological and global business environment. Apply management skills to engineering organizations. Apply advanced skills in a selected engineering specialization (M1, M2, M3).

Measures
M1.   MEEM direct measure
M2.   MEEM Exit Survey
M3.   MEEM Student Evaluations

Part Two: 2016-2017 data will be submitted in the spring of 2017

Space Operations, ME
Updated: Fall 2016
Chair: Chris Nelson
Program Assessment Coordinator: Chris Nelson

Part One: Assurance of Student Learning Plan

Mission Statement

The mission of the College of Engineering and Applied Science is to. Illuminate. Inspire a passion in our students for life-long learning; Investigate. Conduct recognized and relevant research that has local and global impact; Innovate. Engage in leadership, service, economic and technology development that improves health, welfare, and prosperity through engineering. In this context, the purpose of the Master of Engineering programs in Systems Engineering, Engineering Management, and Space Operations, is to prepare students for successful careers, and ensure that students have a strong foundation in engineering science and modern computational methods that they can apply to solving real world engineering problems. To achieve these goals, we will educate students in the skills and knowledge required to formulate and solve problems, help them to develop their creativity, engineering intuition, and teamwork skills.

Teaching Goals

TG1.   ME Space Operations program graduates will know and be able to perform in the following areas.

1) Translate a need, relating to a space mission, into a feasible system design.

2) Apply the principles, concepts and methods of course work in the following areas to the effective design and application of space systems to fulfill a practical mission need.
- Astronautics
- Spacecraft Environment
- Remote Sensing
- Spacecraft Dynamics
- Spacecraft Communications
- Mission Analysis

Program Student Learning Outcomes

PSLO1. Translate a need, relating to a space mission, into a feasible system design. Apply the principles, concepts and methods of course work in astronautics, spacecraft environment and dynamics, space communications, and mission analysis for the effective design and application of space systems to fulfill a practical mission need (M1, M2, M3).

Measures
    M1.   MESO Capstone Course
    M2.   MESO Exit Survey
    M3.   MESO Student Evaluations

Part Two: 2016-2017 data will be submitted in the spring of 2017

Systems Engineering, ME
Updated: Fall 2016
Chair: Chris Nelson
Program Assessment Coordinator: Chris Nelson

Part One: Assurance of Student Learning Plan

Mission Statement
    The mission of the College of Engineering and Applied Science is to. Illuminate. Inspire a passion in our students for life-long learning; Investigate. Conduct recognized and relevant research that has local and global impact; Innovate. Engage in leadership, service, economic and technology development that improves health, welfare, and prosperity through engineering. In this context, the purpose of the Master of Engineering programs in Systems Engineering, Engineering Management, and Space Operations, is to prepare students for successful careers, and ensure that students have a strong foundation in engineering science and modern computational methods that they can apply to solving real world engineering problems. To achieve these goals, we will educate students in the skills and knowledge required to formulate and solve problems, help them to develop their creativity, engineering intuition, and teamwork skills.

Teaching Goals

    TG1.   ME Systems Engineering program graduates will know and be able to perform in the following areas.
        – Broad understanding of the systems engineering life-cycle process.
        – Thorough understanding of project management techniques applied to technical development, including risk analysis.
        – Proficiency with mathematical tools and techniques used to perform systems analysis, trade-off studies, and high-level modeling.
        – Broad understanding of systems architecture and its relationship to system design.

Program Student Learning Outcomes
    PSLO1. Develop a product or process system design based on an identified need or deficiency. Apply principles and methods of program management and systems engineering for the effective design and management of technology-based projects. Apply decision analysis methodologies, risk analysis, modeling & simulation, and trade space optimization techniques to practical systems

engineering problems. Produce key systems engineering artifacts, including. project schedule, systems engineering plan, system requirements document, test plan, and various design and development documents (M1, M2, M3).

Measures
    M1. MESYE Capstone Course
    M2. MESYE Exit Survey
    M3. MESYE Student Evaluations

Part Two: 2016-2017 data will be submitted in the spring of 2017

Engineering, PhD

Updated: Fall 2014
Chair: Charles Zhou
Program Assessment Coordinator: Terrance Boult

Part One: Assurance of Student Learning Plan

Mission Statement

    Illuminate, Illustrate, Innovate

Teaching Goals

    TG1.   Students should have a demonstrated breadth of knowledge in their subfield of engineering.

Program Student Learning Outcomes

    PSLO1. Ability to interpret and critically assess literature on advance topics in engineering (M1, M2, M3, M4 and M5)

    PSLO2. Write coherent technical reports and other documentation reporting the results of fundamental investigations (M2, M3, M4 and M5).

    PSLO2. Give professional oral presentations of the procedures used and conclusions reached in investigations (M2, M3 and M4).

Measures

    M1.   Preliminary Exam. An examination is administered within the first year of each student's PhD program that covers five to ten important areas in electrical engineering, mechanical engineering, computer science or security depending in the student's background. It can be attempted twice. The results of the examination are discussed based on the student's ability to perform the research.

M2.   Comprehensive Exam. An examination is administered within the two year of each student's PhD program that covers five to ten important areas in electrical engineering, mechanical engineering, computer science or security depending in the student's background. It can be attempted twice. The results of the examination are discussed based on the student's ability to perform the research.

M3.   Comp. Questionnaire. Each committee member fills out the PhD Comprehensive Questionnaire when the students stands for the exam. The students' exam committee assess level of competency in key domains.

M4.   Dissertation Oral Defense. The final oral defense of the dissertation is made before the committee and is open to all EAS faculty, fellow students, and the pertinent research community. The committee judges whether the students has met the criteria or originality, sufficient comprehensive literature review, appropriate approaches to the problem solution, reasonableness of results and acceptable presentation. A majority vote is required. If not achieved, a second try is allowed after a period of time determined by the committee. Each Committee member completes an Oral Presentation Questionnaire.

M5.   Dissertation Evaluation. The advisor gives initial approval of the written dissertation, followed by the second reader's opinion. The student then submits the dissertation to the entire dissertation committee, composed of five faculty members, two weeks prior to the formal presentation. After review of the content and format, each member completes a Dissertation Evaluation Questionnaire.

Part Two: Results of Assessment Activities

PSLO 1: ability to interpret and critically assess literature on advance topics in engineering.

M1.   Preliminary Exam (Written, qualifying exams and oral exam in CS/Security
6/8 students passed written exam, 7/7 Passed CS Oral Exam

M2.   Comprehensive Exam
10 out of 10 students successfully passed their comprehensive exam

M3.   Comprehensive Questionnaire
10 out of 10 students had comprehensive exams faculty questionnaire at acceptable levels, with most students' command of literature rated between 5 and 6, with 6 as the max.

M4.   Dissertation Oral Defense
11 out of 11 students successfully passed their oral thesis defense.

M5.   Dissertation Evaluation
11 out of 11 students had written thesis accepted and graduated

Summary of findings for PSLO 1 and associated measures
Overall students' mastery of literature of advanced topics is good. Each track provides courses students can use to prepare for the preliminary/qualifying exams, or even waive then with sufficient grades. The preliminary and oral exams are designed as a filter for students that lack knowledge, and the programs have a strong time limit by which time students must take the exam, thus it is considered acceptable that not all students pass that exam. Our goal is to help students decided quickly if they are not well suited to the Ph.D.

PSLO 2: write coherent technical reports and other documentation reporting the results of fundamental investigations.

M2.   Comprehensive Exam
10 out of 10 students provided a written report that allowed them to successfully passed their comprehensive exam

M3.   Comp. Questionnaire
10 out of 10 students had comprehensive exams faculty questionnaire showing acceptable levels of writing, with average score for writing abilities between 4 and 5 (with max=6)

M5.   Dissertation Eval.
11 out of 11 students successfully passed their oral thesis defense.

PSLO 2 and Associated Measures Summary -

Most student oral presentations were well above the minimum standard for passing.

PSLO 3: give professional oral presentations of the procedures used and conclusions reached in investigations.

M2.   Comprehensive Exam
10 out of 10 students successfully passed the oral presentation of their comprehensive exam

M3.   Comp. Questionnaire
10 out of 10 students had comprehensive exams faculty questionnaire showing acceptable levels of writing, with average score for writing abilities between 4 and 5.

M4.   Dissertation Oral Defense – *no data provided.*

Other Indicators of Student Learning

OI1. Other Oral Presentations
The various the tracks PhD program encourage students to give oral presentations at national and international conferences publications. Of the 11 graduates, at least 6 of them gave presentations associated with their publications as first author. At least one of these papers was the "best paper" and another was in the top 3 of people's choice.   These further support the assessment of overall good quality of student written presentation of their fundamental research.

OI2. Other Publications
Some of the tracks PhD program require and most encourage students to publish papers in refereed publications. Of the 11 graduates, at least 8 of them had peer-reviewed publications as first author. These further support the assessment of overall good quality of student written presentation of their fundamental research.

Appendix: Measures

Game Design and Development, BI

M1. Basic Programming Skill: These are individual game development assignments that the students complete at the start of their course of study.

GDD 1200 Assignment 8: Game Project, Part 1

Name: How many hours did you spend on this assignment?

Grading Criteria

Criteria	Points Possible	Points Earned
Code compiles without errors		
Window Resolution, Mouse Visibility and Game State Window resolution set to 800 by 600	15	
Opening Screen Opening screen displayed properly	35	
Number Board Constructor correct	50	
Coding Style Code is readable and follows coding standards	-20	
TOTAL	100	

M2. Advanced Programming Skills: These are individual game development assignments that the students complete later in their course of study. They provide students with some latitude in terms of the constraints placed on the games they develop.

GDD2250 Assignment 5: Searchable Weapons

Name: _____   Email: _____

How many hours did you spend on this assignment? _____

Did you attempt the extra credit?   _____

Grading Criteria

Criteria	Points Possible	Points Earned
Code compiles without significant warnings or errors	MANDATORY	MANDATORY
Binary Tree Implementation Implement the destructor and MakeEmpty method (10) Implement the Remove methods Node with zero children (5 pts) Node with one child (10 pts)	60	
Templates Main supports templates (5)	20	
Weapon Support & Processing Main tests an Armory of Weapons Adds weapons Searches for Weapons	20	
Coding Style Code is readable, maintainable, follows coding standard	-10	
TOTAL	100	
Extra Credit: Balance your tree using AVL. MUST complete tree implementation to be eligible for Extra Credit.	40	

M3. Game Design Fundamentals: This measure is to quantify student understanding of fundamental game design topics

M4. Capstone Project" This is a commercial-quality game students develop as a capstone experience in the GDD program. Students have total freedom to develop a game of their choice, but a solid understanding of game design fundamentals and advanced programming skill are required to develop a game of the appropriate scope and quality.

M5. Exit Interview: These interviews will focus on student self-assessment of their achievement of each of the program objectives. They'll also contain open-ended questions about ways to improve the program.

Information Assurance, ME

M1. Master Thesis or Project - Written Rubric

Rubric for Thesis or Project Report Evaluation

The MEIA thesis or project reports are evaluated based on the eight criteria in the following table.

Report Evaluation Criteria	Possible Points	Points Assigned
Is the thesis/report well organized?	6	
Is the thesis/report self-contained?	6	
Is the title appropriate?	6	
Is the thesis/report well written?	6	
Are there adequate references?	6	
What is the degree of originality of the work?	6	
Did the student exhibit independent thinking?	6	
Is the work publishable?	6	
Total Possible Points	48	

Scoring Guide

I. Is the thesis/report well organized?

6. Outstanding – The report
   – has a clear thesis containing necessary qualifiers to make it precise.
   – is focused and covered adequately in right length.
   – is substantiated by appropriate evidences and a clearly organized, fairly reasoned arguments.
   – is logically arranged in a comprehensive, coherent, and engaging manner.
   – contains necessary transitions which explain how the thesis, its reasons or ideas are related.

5. Excellent – The report is overall well-organized, meets almost all the above five aspects but with minor shortcomings in one aspect.
4. Exceeds standards – The report needs to improve in one of the above five aspects.
3. Good – The report needs to improve in two of the above five aspects.
2. Adequate – The report needs to improve in three of the above five aspects, is somewhat structured, spent too much time on unimportant material, and contains disjointed sequence.
1. Poor – The report needs to improve in four of the above five aspects, is unstructured, strays from the subject, and has much of the presentation not in a logical order.

Is the thesis/report self-contained?

6. Outstanding – The report
  – is written with consideration of the background knowledge of audiences.
  – is written with consideration of the needs of audiences.
  – is written with consideration of the perception of audiences, uses a tone and point of view that the audience can appreciate
  – includes necessary information for others to evaluate the design/analysis/implementation.
  – includes necessary information for others to repeat the study,.
5. Excellent – The report is overall self-contained, meets almost all the above five aspects but with minor shortcomings in one aspect.
4. Exceeds standards – The report needs to improve in one of the above five aspects.
3. Good – The report needs to improve in two of the above five aspects.
2. Adequate – The report needs to improve in three of the above five aspects but still allow others to evaluate or repeat the study.
1. Poor – The report needs to improve in four of the above five aspects, skips critical description by assuming that the audiences have same knowledge or access of environment and tools as the author.

Is the title appropriate?

6. Outstanding – The title of the report
  – describes the field of the study correctly.
  – summarizes the content of the study in a condensed manner.
  – represents the right scope of the project.
  – claims the right credit of the research results presented.
  – is Eye-Catching
5. Excellent – The report meets in the above five aspects but with minor shortcomings in one aspect.
4. Exceeds standards – The report needs to improve in one of the above five aspects.
3. Good – The report needs to improve in two of the above five aspects.
2. Adequate – The report needs to improve in three of the above five aspects.
1. Poor – The report needs to improve in four of the above five aspects. Its title misleads the audience, exaggerate the scope, or claim too much credit.

Is the thesis/report well written?

6. Outstanding – The report
    – contains correct syntax with correct and effective sentences.
    – has no grammar or formatting mistakes.
    – has no typos.
    – chooses the proper and precise words with connotations appropriate to its context.
    – presents results in an objective and scientific manner.
5. Excellent – The report meets in the above five aspects but with minor shortcomings in one aspect.
4. Exceeds standards – The report needs to improve in one of the above five aspects.
3. Good – The report needs to improve in two of the above five aspects.
2. Adequate – The report needs to improve in three of the above five aspects.
1. Poor – The report needs to improve in four of the above five aspects. The report has too many typos, grammatical errors, and is not written in an objective and concise manner.

Are there adequate references?

6. Outstanding – The references of the report
    – contain all important literature referenced.
    – contain all key techniques and tools used in the study.
    – contain all related data used for comparison.
    – contain the right information for retrieving the source.
    – are written in the professional format.
5. Excellent – The report meets in the above five aspects but with minor shortcomings in one aspect.
4. Exceeds standards – The report needs to improve in one of the above five aspects.
3. Good – The report needs to improve in two of the above five aspects.
2. Adequate – The report needs to improve in three of the above five aspects.
1. Poor – The report needs to improve in four of the above five aspects. The report was not written in a professional format with information for others to retrieve the sources.

What is the degree of originality of the work?
6. Outstanding – The work is pioneering and ground breaking.
5. Excellent – The work is new and never being done before.
4. Exceeds standards – The work significantly enhances previous work.
3. Good – The work enhances previous work.
2. Adequate – The work provides new information and slightly improves previous work.
1. Poor – The work neither contains any new information, nor improves previous work.

Did the student exhibit independent thinking?

6. Outstanding – The student can carry out research independently with no guidance from the advisor.
5. Excellent – The student can carry out research independently with little no guidance from the advisor.
4. Exceeds standards – The student can carry out research independently most of the time and know to check back with the advisor with good description and analysis of the problems encountered.
3. Good – The student can carry out research independently half of time and know to check back with the advisor with good description of the problems encountered.
2. Adequate – The student can carry out research independently after specific instructions from the advisor.
1. Poor – The student can carry out research independently even with specific instructions from the advisor.

Is the work publishable?

6. Outstanding – The work contains significant publishable results and already written in a format ready for submission.
5. Excellent – The work contains significant publishable results but still requires some minor revision before ready for submission.
4. Exceeds standards – The work contains significant publishable results but requires major revision before ready for submission.
3. Good – The work contains publishable results but still requires minor revision before ready for submission.
2. Adequate – The work contains publishable results but requires major revision before ready for submission.
1. Poor – The work does not contain publishable results.

References
How Do Rubric Help, www.uccs.edu/~assess/files/Rubrics.doc
GSW Paper Evaluation Rubric, http://www.bgsu.edu/offices/gsw/page97589.html
Rubric for Research Papers,
http://www.louisianavoices.org/Unit3/edu_unit3_rubric_research.html
Rubrics Examples from UCCS SAAC Office, http://cs.uccs.edu/~saac/doc/SAACRubrics.pdf
(with username=saac password=uccs)

Measure 1, Part 2 – Oral Rubric - for Oral Defense Evaluation

The MEIA Oral Defense is evaluated based on the six criteria in the following table:

Report Evaluation Criteria	Possible Points	Points Assigned
Quality of the presentation media	6	
Focus on the appropriate material	6	
Clarity of the presentation	6	
Understand of the topic	6	
Ability to adequately address questions	6	
Analysis and evaluation of the results	6	
Total Possible Points	36	

Scoring Guide

I. Quality of the presentation media

6. Outstanding – The presentation media are prepared in professional manner where
   – The format, typeface, and colors of the presentation material is consistent and readable by all in the room.
   – Details are minimized so that main points stand out.
   – Color scheme or font size/style/weight are used to emphasize key points.
   – Enough contrast between background and foreground to make content easy to read.
   – No spelling or grammatical errors.
5. Excellent – The quality of the presentation media is high and meets almost all the above five aspects but with minor shortcomings in one aspect.
4. Exceeds standards – The quality of the presentation media needs to improve in one of the above five aspects.
3. Good – The quality of the presentation media needs to improve in two of the above five aspects.
2. Adequate – The quality of the presentation media needs to improve in three of the above five aspects.
1. Need improvement – The quality of the presentation media needs to improve in four of the above five aspects.

II. Focus on the appropriate material

6. Outstanding – The presentation material is well structured and focused where
   – The appropriate amount of material are chosen to match the scheduled presentation time.
   – The presentation material highlights the key contributions of the work with proper portions of the time.
   – Everything in your presentation is both consistent with, and supportive of, that key message
   – The presentation material takes into consideration of the background of audiences, prepare and guide them to appreciate the key message.
   – The presentation material is written with consideration of the perception of audiences, uses a tone and point of view that the audience can appreciate.

5. Excellent – The presentation material is overall well focused, meets almost all the above five aspects but with minor shortcomings in one aspect.
4. Exceeds standards – The presentation material needs to improve in one of the above five aspects.
3. Good – The presentation material needs to improve in two of the above five aspects.
2. Adequate – The presentation material needs to improve in three of the above five aspects.
1. Need improvement – The presentation material needs to improve in four of the above five aspects.

III. Clarity of the presentation

6. Outstanding – The presentation is delivered with clarity where the student
   – Uses a clear voice with proper volume, vocal variety, rhythm, and correct, precise pronunciation of terms so that all audience members can hear and enjoy the presentation.
   – Maintains direct eye contact, seldom looking at the notes; is relaxed and self-confident; appropriate appearance.
   – Responsive to audience comments/needs, consistently clarifies, restates, and responds to questions; summarizes when needed.
   – Makes movements or gestures that enhance articulation.
   – Shows enthusiasm about the topics presented.
5. Excellent – The delivery of the presentation meets in the above five aspects but with minor shortcomings in one aspect.
4. Exceeds standards – The delivery of the presentation needs to improve in one of the above five aspects.
3. Good – The delivery of the presentation needs to improve in two of the above five aspects.
2. Adequate – The delivery of the presentation needs to improve in three of the above five aspects.
1. Need improvement – The delivery of the presentation needs to improve in four of the above five aspects.

IV. Understand of the topic

6. Outstanding – The student demonstrates full knowledge of the topic by
   – Explaining or paraphrasing the basic definitions, theory, techniques, or processes.
   – Distinguishing or classifying the concepts within the area.
   – Extending, or relating the concepts.
   – Applying the techniques to the real world situations or hypothetical cases.
   – Articulating or summarizing the key contributions.
5. Excellent – The student demonstrates the above five capabilities but with minor deficiency in one capability.
4. Exceeds standards – The student needs to improve one of the above five capabilities.
3. Good – The student needs to improve in two of the above five capabilities.
2. Adequate – The student needs to improve in three of the above five capabilities.
1. Need improvement – The student needs to improve in four of the above five capabilities.

V. Ability to adequately address questions

6. Outstanding – The student demonstrates the ability to adequately address questions by
   – Providing concise answers with good examples.
   – Clarifying the intention of a vague question or put them in proper context or roadmap.
   – Offering references to related work.
   – Discussing or debating the opposing viewpoints in an objective, respectfully, and strategically manner, e.g., both oral and body language are free from bias.
   – Deferring questions yet to be answered later in the presentation.
5. Excellent – The student demonstrate the above five aspects but with minor shortcomings in one aspect.
4. Exceeds standards – The student needs to improve in one of the above five aspects.
3. Good – The student needs to improve in two of the above five aspects.
2. Adequate – The student needs to improve in three of the above five aspects.
1. Need improvement – The student needs to improve in four of the above five aspects.

VI. Analysis and evaluation of the results
6. Outstanding – The student shows the abilities to analyze and evaluate the results by
   – Providing precise assumptions where the analysis or evaluation is based.
   – Assessing the impact of various parameters.
   – Performing correct analysis or evaluation given a scenario under pressure. (Think on one's feet.)
   – Providing honest appraisal on one's work.
   – Articulating the metrics used for the analysis and evaluation.
5. Excellent – The student demonstrates the above five capabilities but with minor deficiency in one capability.
4. Exceeds standards – The student needs to improve one of the above five capabilities.
3. Good – The student needs to improve in two of the above five capabilities.
2. Adequate – The student needs to improve in three of the above five capabilities.
1. Need improvement – The student needs to improve in four of the above five capabilities.

References
How Do Rubric Help, www.uccs.edu/~assess/files/Rubrics.doc
Rubrics Examples from UCCS SAAC Office, http://cs.uccs.edu/~saac/doc/SAACRubrics.pdf
(with username=saac password=uccs)

M2. Exit Survey
No copy available

Electrical Engineering, MS

M1. Thesis-written: Student distributes a written thesis/report and orally presents the thesis/report to a committee of graduating faculty members; the evaluation form is completed by all graduate faculty members in attendance at the presentation.

Department of Electrical and Computer Engineering - MSEE Report Evaluation

Semester _____

Student's Name: _____

Report Title: _____

Committee Member: _____

Please evaluate by filling in the circled numbers on a scale of:

    ①   Needs improvement
    ②   Adequate
    ③   Good
    ④   Exceeds standards
    ⑤   Excellent
    ⑥   Outstanding

I.	Is the report well organized?	① ② ③ ④ ⑤ ⑥
II.	Is the report self-contained?	① ② ③ ④ ⑤ ⑥
III.	Is the title appropriate?	① ② ③ ④ ⑤ ⑥
IV.	Does the abstract include appropriate points of the report?	① ② ③ ④ ⑤ ⑥
V.	Do the figures, tables and their captions follow IEEE standards?	① ② ③ ④ ⑤ ⑥
VI.	Is the report well written?	① ② ③ ④ ⑤ ⑥
VII.	Are there adequate references?	① ② ③ ④ ⑤ ⑥
VIII.	What is the degree of originality of this report?	① ② ③ ④ ⑤ ⑥
IX.	Did the student exhibit independent thinking?	① ② ③ ④ ⑤ ⑥
X.	Is the report material publishable?	① ② ③ ④ ⑤ ⑥
XI.	What is the contribution level to engineering field?	① ② ③ ④ ⑤ ⑥

Total Score: (out of 66)

Comments:

Version 4: 11-21-05

M2. Thesis- oral: Thesis committee completes this questionnaire during the thesis/report or project presentation

Department of Electrical and Computer Engineering - MSEE Thesis Oral Presentation Rubric

Semester: _____

Student's Name: _____

Defense Title: _____

Thesis Committee Member: _____

Please evaluate by filling in the circled numbers on a scale of:

       ①   Needs improvement
       ②   Adequate
       ③   Good
       ④   Exceeds standards
       ⑤   Excellent
       ⑥   Outstanding

Is the presentation coherent and well organized?	① ② ③ ④ ⑤ ⑥
Did the presentation cover all the valid points in detail?	① ② ③ ④ ⑤ ⑥
Is the presentation content relevant to the topic?	① ② ③ ④ ⑤ ⑥
Did the presenter answer all relevant questions?	① ② ③ ④ ⑤ ⑥
Was the length of presentation appropriate?	① ② ③ ④ ⑤ ⑥
Was the presentation media appropriate?	① ② ③ ④ ⑤ ⑥
Was the presenter enthusiastic?	① ② ③ ④ ⑤ ⑥

Comments (use back side if necessary):

M3. Exit Questionnaire: Upon successful completion of the oral defense the graduating student will be asked to complete an Exit Questionnaire.

<div align="center">MSEE Exit Questionnaire</div>

Semester:

Student's Name: _____

Defense Title: _____

① Needs improvement
② Adequate
③ Good
④ Exceeds standards
⑤ Excellent
⑥ Outstanding

Was your coursework relevant and useful? ① ② ③ ④ ⑤ ⑥

Did your coursework prepare you to perform research/report? ① ② ③ ④ ⑤ ⑥

Were the laboratory and computer/software facilities adequate? ① ② ③ ④ ⑤ ⑥

Were the library facilities adequate? ① ② ③ ④ ⑤ ⑥

Did you obtain enough guidance from your advisor? ① ② ③ ④ ⑤ ⑥

Was your advisor approachable? ① ② ③ ④ ⑤ ⑥

Did your advisor assist you in forming a research/report problem? ① ② ③ ④ ⑤ ⑥

Was the college faculty helpful during your research/report project? ① ② ③ ④ ⑤ ⑥

Comments (use back side if necessary):

M4. Alumni Survey - M.S.E.E. Alumni Questionnaire

      ①   Needs improvement
      ②   Adequate
      ③   Good
      ④   Exceeds standards
      ⑤   Excellent
      ⑥   Outstanding

1) To what extent did earning an M.S.E.E make a difference in career?

1   2   3   4   5   6

2) Are you still in touch with the developments taking place in your field of study?

1   2   3   4   5   6

3) Are you still contributing to your field of study?

1   2   3   4   5   6

4) Did your M.S.E.E experience prepare you for your professional life?

1   2   3   4   5   6

5) In your current career, do you have the opportunity to participate as a scholar in the field?

1   2   3   4   5   6

6) Are you still as passionate now, as an alumnus, about your field of study when you were involved in doctoral studies?

      1   2   3   4   5   6

7) Was your M.S.E.E experience helpful in supervising challenging projects?

1   2   3   4   5   6

8) Do you have any suggestions regarding improving the overall M.S.E.E program experience.

Mechanical and Aerospace Engineering, MS

M1. Thesis Evaluation: Student distributes a written thesis/report and orally presents the thesis/report to a committee of graduate faculty members; the evaluation form is completed by student's thesis committee members in attendance at the presentation.

Measure 1: Part 1 – Thesis Written Component:

Semester _____

Student's Name: _____

Report Title: _____

Committee Member: _____

Please evaluate by filling in the circled numbers on a scale of:

①	Needs improvement	④	Exceeds standards
②	Adequate	⑤	Excellent
③	Good	⑥	Outstanding

I.   Is the report well organized?   ① ② ③ ④ ⑤ ⑥

II.   Is the report self-contained?   ① ② ③ ④ ⑤ ⑥

III.   Is the title appropriate?   ① ② ③ ④ ⑤ ⑥

IV.   Does the abstract include appropriate points of the report?   ① ② ③ ④ ⑤ ⑥

V.   Do the figures, tables and their captions follow IEEE standards?   ① ② ③ ④ ⑤ ⑥

VI.   Is the report well written?   ① ② ③ ④ ⑤ ⑥

VII.   Are there adequate references?   ① ② ③ ④ ⑤ ⑥

VIII.   What is the degree of originality of this report?   ① ② ③ ④ ⑤ ⑥

IX.   Did the student exhibit independent thinking?   ① ② ③ ④ ⑤ ⑥

X.   Is the report material publishable?   ① ② ③ ④ ⑤ ⑥

XI.   What is the contribution level to engineering field?   ① ② ③ ④ ⑤ ⑥

Total Score: (out of 66)

Comments: Version 4: 11-21-05

Measure 1, Part 2 - Thesis Oral Component:

Semester:

Student's Name: _____

Defense Title: _____

Thesis Committee Member: _____

Please evaluate by filling in the circled numbers on a scale of:

①	Needs improvement	④	Exceeds standards
②	Adequate	⑤	Excellent
③	Good	⑥	Outstanding

Is the presentation coherent and well organized?   ① ② ③ ④ ⑤ ⑥

Did the presentation cover all the valid points in detail?   ① ② ③ ④ ⑤ ⑥

Is the presentation content relevant to the topic?   ① ② ③ ④ ⑤ ⑥

Did the presenter answer all relevant questions?   ① ② ③ ④ ⑤ ⑥

Was the length of presentation appropriate?   ① ② ③ ④ ⑤ ⑥

Was the presentation media appropriate?   ① ② ③ ④ ⑤ ⑥

Was the presenter enthusiastic?   ① ② ③ ④ ⑤ ⑥

Comments (use back side if necessary):

M2. Project 1 in both MAE 5011 & MAE 5012 - one of these required for all MS Students
No copy of measure available

M3. MSME Exit Questionnaire: Upon successful completion of the oral defense the graduating student will be asked to complete an Exit Questionnaire.

Exit Questionnaire

Semester: _____ Summer 2013 _____

Student's Name: _____

Defense Title: _____

①   Needs improvement
②   Adequate
③   Good
④   Exceeds standards
⑤   Excellent
⑥   Outstanding

Was your coursework relevant and useful?   ① ② ③ ④ ⑤ ⑥

Did your coursework prepare you to perform research/report?   ① ② ③ ④ ⑤ ⑥

Were the laboratory and computer/software facilities adequate?   ① ② ③ ④ ⑤ ⑥

Were the library facilities adequate?   ① ② ③ ④ ⑤ ⑥

Did you obtain enough guidance from your advisor?   ① ② ③ ④ ⑤ ⑥

Was your advisor approachable?   ① ② ③ ④ ⑤ ⑥

Did your advisor assist you in forming a research/report problem?   ① ② ③ ④ ⑤ ⑥

Was the college faculty helpful during your research/report project?   ① ② ③ ④ ⑤ ⑥

Comments (use back side if necessary):

M4. Alumni Survey: An Alumni survey

①   Needs improvement
②   Adequate
③   Good
④   Exceeds standards
⑤   Excellent
⑥   Outstanding

1) To what extent did earning an M.S.E.E make a difference in career?

1   2   3   4   5   6

2) Are you still in touch with the developments taking place in your field of study?

1   2   3   4   5   6

3) Are you still contributing to your field of study?

1   2   3   4   5   6

4) Did your M.S.E.E experience prepare you for your professional life?

1   2   3   4   5   6

5) In your current career, do you have the opportunity to participate as a scholar in the field?

1   2   3   4   5   6

6) Are you still as passionate now, as an alumnus, about your field of study when you were involved in doctoral studies?

 1   2   3   4   5   6

7) Was your M.S.E.E experience helpful in supervising challenging projects?

1   2   3   4   5   6

8) Do you have any suggestions regarding improving the overall M.S.E.E program experience.

Engineering, PhD

M1. Basic Programming Skill: These are individual game development assignments that the students complete at the start of their course of study.

Ph.D. Dissertation Oral Presentation Questionnaire
                    Semester: _____

Student's Name: _____

Dissertation Title: _____

Examiner's Name: _____

       ①   Needs improvement
       ②   Adequate
       ③   Good
       ④   Exceeds standards
       ⑤   Excellent
       ⑥   Outstanding

Is the presentation coherent and well organized?   ① ② ③ ④ ⑤ ⑥

Did presentation cover all the valid points in detail?   ① ② ③ ④ ⑤ ⑥

Is the presentation content relevant to the topic?   ① ② ③ ④ ⑤ ⑥

Did the presenter answer all relevant questions?   ① ② ③ ④ ⑤ ⑥

Was the length of presentation appropriate?   ① ② ③ ④ ⑤ ⑥

Was the presentation media appropriate?   ① ② ③ ④ ⑤ ⑥

Was the presenter enthusiastic?   ① ② ③ ④ ⑤ ⑥

TOTAL SCORE (out of 42):   [ ]

Comments (use back side if necessary):

M2. Advanced Programming Skills: These are individual game development assignments that the students complete later in their course of study. They provide students with some latitude in terms of the constraints placed on the games they develop.

Ph.D. Dissertation Evaluation

Semester _____

Student Name _____
Thesis Title _____
Thesis Committee Member _____

Please evaluate by filling in the circled numbers on a scale of:

        ①   Needs improvement
        ②   Adequate
        ③   Good
        ④   Exceeds standards
        ⑤   Excellent
        ⑥   Outstanding

I.	Is the thesis is well organized?	① ② ③ ④ ⑤ ⑥
II.	Is the thesis is self-contained?	① ② ③ ④ ⑤ ⑥
III.	Is the title appropriate?	① ② ③ ④ ⑤ ⑥
IV.	Does the abstract include appropriate points of the thesis?	① ② ③ ④ ⑤ ⑥
V.	Are the figures, tables and their captions follow IEEE standards?	① ② ③ ④ ⑤ ⑥
VI.	Is the thesis well written?	① ② ③ ④ ⑤ ⑥
VII.	Are there adequate references?	① ② ③ ④ ⑤ ⑥
VIII.	Is the thesis original?	① ② ③ ④ ⑤ ⑥
IX.	Did the student exhibit independent thinking?	① ② ③ ④ ⑤ ⑥
X.	Is the thesis material publishable?	① ② ③ ④ ⑤ ⑥
XI.	What is the contribution level to engineering field?	① ② ③ ④ ⑤ ⑥

Total Score: (out of 66)
Comments:

Measure 3: Ph.D. Comprehensive Exam Questionnaire
Semester:

Student's Name: _____

Proposal Title: _____

Examiner's Name: _____

Please evaluate by filling in the circled numbers on a scale of:

①   Needs improvement
②   Adequate
③   Good
④   Exceeds standards
⑤   Excellent
⑥   Outstanding

Has the student clearly identified the problem to pursue?   ① ② ③ ④ ⑤ ⑥

Has the student surveyed the relevant literature?   ① ② ③ ④ ⑤ ⑥

Has the student completed a preliminary investigation of the topic? ① ② ③ ④ ⑤ ⑥

Is the preliminary investigation promising?   ① ② ③ ④ ⑤ ⑥

Is the proposed work original?   ① ② ③ ④ ⑤ ⑥

Can the work be completed in the proposed timeline?   ① ② ③ ④ ⑤ ⑥

Does the student have adequate experimental/theoretical   ① ② ③ ④ ⑤ ⑥
background to pursue the proposed topic?

Are the laboratory and computer/software facilities available
for the proposed work?   ① ② ③ ④ ⑤ ⑥

Does the proposed work result in significant journal and   ① ② ③ ④ ⑤ ⑥
conference publications?

Does the proposed work open a new area of research for mankind? ① ② ③ ④ ⑤ ⑥

TOTAL SCORE (out of 42): _____