LEARNING OUTCOMES ASSESSMENT PLAN
DEPARTMENT OF MATHEMATICAL, INFORMATION AND COMPUTER SCIENCES
Updated Spring 2010

COMPUTER SCIENCE MAJOR

Department Learning Outcome (Teach): Graduates will have a coherent and broad-based knowledge of the discipline of computing.

Means of assessment (annual): Require students to take the ETS Major Field Test in Computer Science as the mid-term exam for the capstone course, Computer Science 481, Senior Seminar in Computer Science.

Criteria of success: 50% of our students achieve above the 50th percentile on the exam.

Department Learning Outcome (Send): Computer Science graduates will be adequately prepared for entry into graduate school or jobs in the computing profession.

Means of assessment (every 5 years): Alumni will be surveyed every five years. They will be asked at least the following questions:
1. If you have a job in Computer Science: On a scale of 1 to 5, 1 being outstanding and 5 being poor, how well do you think that the undergraduate Computer Science curriculum at PLNU prepared you for your work in the field?
2. If you are going to graduate school or went to graduate school: On a scale of 1 to 5, 1 being outstanding and 5 being poor, how well do you think that the undergraduate Computer Science curriculum at PLNU prepared you for graduate school?

Criteria of success: An average response of 2 for each question.

Program Learning Outcomes (Teach and Send):

1. Students will be able to write correct and robust software.

   Means of Assessment (annual): CSC254 Signature Assignment (assignment and rubric to be developed)

   Criteria for Success: To be determined.

2. Students will understand the theory of algorithms and computation.

   Means of Assessment (annual): ETS Major Field Test in Computer Science: Structures and Algorithms subscore

   Criteria for Success: To be determined.

3. Students will understand the interaction between hardware and software.

   Means of Assessment (annual): ETS Major Field Test in Computer Science: Computer Organization, Architecture and Operating Systems subscore

   Criteria for Success: To be determined.
4. Students will be able to apply their technical knowledge to solve problems.

**Means of Assessment (every 2 years):** CSC494 Signature Assignment (assignment and rubric to be developed)

**Criteria for Success:** To be determined.

**Department Learning Outcome (Shape):** Students will be prepared to give an oral technical presentation and a written summary of a topic in their field.

**Means of Assessment (annual):** Each student will be required to give a 20-minute oral presentation and a four page written summary of a topic in their field as a part of their participation in the Senior Seminar in Computer Science. The audience for this talk will include department faculty, fellow students and possibly some alumni. The students will be given the evaluation criteria in advance of their presentation and will be rated by the faculty using a rubric with a scale of 1 (outstanding) to 4 (unsatisfactory) in the following areas:

- **Oral Presentation:**
  - Command of background material
  - Organization
  - Use of presentation tools
  - Oral Presentation Skills
  - Ability to field questions from the audience

- **Written Summary:**
  - Bibliography and other supporting documentation
  - Organization
  - Grammar and spelling
  - Depth of information
  - Clarity of writing

**Criteria of Success:** 80% of the students should have an average score of at least 2.5 in each of the major areas.

**Department Learning Outcome (Shape):** Students will have an understanding of the historical development, contemporary progress and societal role of computer science.

**Means of Assessment (annual):** Each student will be required to write a 3 page paper on the societal role of computer science as part of Senior Seminar.

**Criteria for Success:** Prompt and Rubric to be designed.

**Program Learning Outcomes (Shape)**
The program learning outcomes are the same as the department learning outcomes for this area.
MATHEMATICS MAJOR

Department Learning Outcome (Teach): *Graduates will have a coherent and broad-based knowledge of the discipline of Mathematics.*

Means of assessment (annual): Require students to take the ETS Major Field Test in Mathematics as the mid-term exam for the capstone course, Mathematics 481, Senior Seminar in Mathematics.

Criteria of success: 50% of our students achieve above the 50th percentile on the exam.

Department Learning Outcome (Send): *Mathematics graduates will be adequately prepared for graduate study, teaching and careers using Mathematics.*

Means of assessment (every 5 years): Alumni will be surveyed every five years. They will be asked at least the following questions:

1. If you have a job in industry: On a scale of 1 to 5, 1 being outstanding and 5 being poor, how well do you think that the undergraduate Mathematics curriculum at PLNU prepared you for your work in the field?
2. If you are going to graduate school or went to graduate school: On a scale of 1 to 5, 1 being outstanding and 5 being poor, how well do you think that the undergraduate Mathematics curriculum at PLNU prepared you for graduate school?
3. If you are in a teaching credential program or working as a teacher: On a scale of 1 to 5, 1 being outstanding and 5 being poor, how well do you think that the undergraduate Mathematics curriculum at PLNU prepared you for teaching?

Criteria of success: An average response of 2 for each question.

Means of assessment (annual): Fieldwork evaluations of prospective teachers in EDU304. The students are rated in several areas of competence using a three point rubric (weak =1, acceptable =2 and strong =3). From these scores an overall rating is computed by taking the mean.

Criteria of success: 50% of the students will have an average score of 2.5 or higher.

Program Learning Outcomes (Teach and Send):

1. Students will be able to demonstrate facility with analytical concepts (Real Analysis thread).

   Means of Assessment (annual): ETS Major Field Test in Mathematics: Calculus subscore

   Criteria for Success: To be determined.

2. Students will be able to write and understand proofs.

   Means of Assessment (annual): MTH242 Signature Assignment (assignment and rubric to be developed)

   Criteria for Success: To be determined.

3. Students will be able to demonstrate facility with algebraic structures (Algebra thread).

   Means of Assessment (annual): ETS Major Field Test in Mathematics: Algebra subscore
Criteria for Success: To be determined.

4. Students will be able to demonstrate facility with algebraic structures (Algebra thread).

Means of Assessment (annual): ETS Major Field Test in Mathematics: Applied subscore

Criteria for Success: To be determined.

5. Students will be comfortable using technology to solve problems.

Means of Assessment (annual): MTH382 Signature Assignment (assignment and rubric to be developed)

Criteria for Success: To be determined.

Department Learning Outcome (Shape): Students will be prepared to give an oral technical presentation and a written summary of a topic in their field.

Means of Assessment (annual): Each student will be required to give a 20-minute oral presentation and a four page written summary of a topic in their field as a part of their participation in the Senior Seminar in Mathematics. The audience for this talk will include department faculty, fellow students and possibly some alumni. The students will be given the evaluation criteria in advance of their presentation and will be rated by the faculty using a rubric with a scale of scale of 1 (outstanding) to 4 (unsatisfactory) in the following areas:

- Oral Presentation:
  - Command of background material
  - Organization
  - Use of presentation tools
  - Oral Presentation Skills
  - Ability to field questions from the audience

- Written Summary:
  - Bibliography and other supporting documentation
  - Organization
  - Grammar and spelling
  - Depth of information
  - Clarity of writing

Criteria of Success: 80% of the students should have an average score of at least 2.5 in each of the major areas.

Department Learning Outcome (Shape): Students will have an understanding of the historical development, contemporary progress and societal role of mathematics.

Means of Assessment (annual): Each student will be required to write a 3 page paper on the societal role of mathematics as part of Senior Seminar.

Criteria for Success: Prompt and Rubric to be designed.

Program Learning Outcomes (Shape)
The program learning outcomes are the same as the department learning outcomes for this area.
COMPUTER INFORMATION SYSTEMS MAJOR

Department Learning Outcome (Teach): Graduates will have a coherent and broad-based knowledge of the discipline of Information Systems.

Means of assessment (annual): Require students to take the ETS Major Field Test in Computer Science as the mid-term exam in IS 481, Senior Seminar in Information Systems.

Criteria of success: 50% of our students achieve above the 25th percentile on the exam.

Department Learning Outcome (Send): Computer information Systems graduates will be adequately prepared for entry into the information systems profession.

Means of assessment (every 5 years): Alumni will be surveyed every five years. They will be asked at least the following question:

1. If you have a job in information systems: On a scale of 1 to 5, 1 being outstanding and 5 being poor, how well do you think that the undergraduate Information Systems curriculum at PLNU prepared you for your work in the field?


Program Learning Outcomes (Teach and Send):

1. Students will be able to write correct and robust software.

   Means of Assessment (annual): CSC254 Signature Assignment (assignment and rubric to be developed)

   Criteria for Success: To be determined.

2. Students will understand the interaction between hardware and software.

   Means of Assessment (every 2 years): ISS424 Signature Assignment (assignment and rubric to be developed)

   Criteria for Success: To be determined.

3. Students will understand basic business principles as they relate to information management.

   Means of Assessment (every 2 years): ISS414 Signature Assignment (assignment and rubric to be developed)

   Criteria for Success: To be determined.

4. Students will be able to apply their technical knowledge to solve problems.

   Means of Assessment (every 2 years): ISS424 Signature Assignment (assignment and rubric to be developed)

   Criteria for Success: To be determined.
Department Learning Outcome (Shape): *Students will be prepared to give a written summary of a topic in their field.*

Means of Assessment (annual): Each student will be required to give a 20-minute oral presentation and a four-page written summary of a topic in their field as a part of their participation in the Senior Seminar in Information Systems. The audience for this talk will include department faculty, fellow students and possibly some alumni. The students will be given the evaluation criteria in advance of their presentation and will be rated by the faculty using a rubric with a scale of 1 (outstanding) to 4 (unsatisfactory) in the following areas:

- **Oral Presentation:**
  - Command of background material
  - Organization
  - Use of presentation tools
  - Oral Presentation Skills
  - Ability to field questions from the audience

- **Written Summary:**
  - Bibliography and other supporting documentation
  - Organization
  - Grammar and spelling
  - Depth of information
  - Clarity of writing

Criteria of Success: 80% of the students should have an average score of at least 2.5 in each of the major areas.

Department Learning Outcome (Shape): *Students will have an understanding of the historical development, contemporary progress and societal role of computer information systems.*

Means of Assessment (annual): Each student will be required to write a 3-page paper on the societal role of computer information systems as part of Senior Seminar.

Criteria for Success: *Prompt and Rubric to be designed.*

Program Learning Outcomes (Shape)
The program learning outcomes are the same as the department learning outcomes for this area.
ROTATION FOR ASSESSMENTS

2009-10
ETS Exam
Senior Seminar Oral and Written Presentations
Alumni Survey

2010-11
ETS Exam
Senior Seminar Oral and Written Presentations
CSC254 Signature Assignment and Rubric (develop)
MTH242 Signature Assignment and Rubric (develop)
ISS424 Signature Assignment and Rubric (develop)

2011-12
ETS Exam
Senior Seminar Oral and Written Presentations
Senior Seminar Societal Role Assignment and Rubric (develop)
CSC254 Signature Assignment
MTH242 Signature Assignment
MTH382 Signature Assignment and Rubric (develop)
ISS414 Signature Assignment and Rubric (develop)

2012-13
ETS Exam
Senior Seminar Oral and Written Presentations
Senior Seminar Societal Role Assignment
CSC254 Signature Assignment
CSC494 Signature Assignment and Rubric (develop)
MTH242 Signature Assignment
ISS424 Signature Assignment

2013-14
ETS Exam
Senior Seminar Oral and Written Presentations
Senior Seminar Societal Role Assignment
CSC254 Signature Assignment
MTH242 Signature Assignment
MTH382 Signature Assignment
ISS414 Signature Assignment
Alumni Survey

2014-15
ETS Exam
Senior Seminar Oral and Written Presentations
Senior Seminar Societal Role Assignment
CSC254 Signature Assignment
CSC494 Signature Assignment
MTH242 Signature Assignment
ISS424 Signature Assignment

Note that some of the signature assignments may move to alternating years once rubrics are tested.