MICS Assessment and Core Competencies

1. *Brief descriptive overview how CCs will be assessed annually in the student's senior year (1-2 pages)*

    - Oral Communication – assessed in the Senior Seminar final presentation
    - Written Communication, Information Literacy and Critical Thinking – assessed in the Senior Seminar paper.
    - Quantitative literacy – QL is fundamental to the disciplines and assessed in much greater depth throughout our program. We have created a specific assignment related to finding a job and paying off school loans to meet the criteria set in the AAC&U QL rubric.

2. *Course(s) in the Senior year where the CCs will be assessed*

    The CC's will be assessed in our Senior Seminar (MTH481, CSC481, ISS481) which is taught every spring. The students who take this class are assessed within 9 months of graduation (May or December graduates).

3. *Faculty for fall 2014 who will oversee the assessment and/or those who will teach the fall 2014 courses (also, spring 2015 if available)*

    The course is only taught in the spring. The faculty leadership for the course rotates. In the Spring 2015 the instructor will be Dr. Maria Zack.

4. *Describe the process of faculty calibration for the assessment of CCs (expectation is PLOs and CCs are assessed by more than one person)*

    We have been assessing student work in the areas of oral communication, written communication, information literacy and critical thinking for several years. We have refined the assignments and the rubrics over time so the calibration is fairly well ingrained in the department. The oral presentations are scored by a panel of several faculty (5 or more) and the written report (writing, information literacy and critical thinking) is scored using two reader agreement with the professor of record for the class providing the third reader if necessary. We will begin using the quantitative literacy assignment and rubric beginning on the spring of 2015. We will do some calibration on scoring that, when we being using it. It is worth noting that our department has a single day every semester when the faculty work through assessing a large number of artifacts that are part of our assessment plan. At the start of those days we being in calibration exercises as necessary.

5. *Assessment assignments (remember one assignment may include more than one CC such as information literacy, written communication, and critical thinking) WASC Handbook states, Capstones, portfolios, research projects, signature assignments, internships, and comprehensive examinations provide rich evidence that can be analyzed for multiple outcomes, both specialized and common to all programs, at a point close to graduation.."*

    Senior Seminar Oral Presentation: assignment attached, this is part of the course description of the written and oral presentation process. Note that the instructions for this assignment are in the process of being updated and extended for more general use as part of the NILOA Assessment Library. This work will be completed in June of 2014. Currently students are given guidance though a detailed discussion of the rubrics.

    Senior Seminar Written Report: assignment attached, this is part of the course description of the written and oral presentation process. Note that the instructions for this assignment are in the process of being updated and extended for more general use as part of the NILOA Assessment

Library. This work will be completed in June of 2014. Currently students are given guidance though a detailed discussion of the rubrics.

Quantitative Literacy Assignment: assignment attached, this is in draft form as the department works through the details of this assignment (it will not be used until spring 2015 so we are still having conversations about the details of the rubric and assignment description).

See Appendix A for the assignments (updated with the changes we will be making for the Spring of 2015).

6. *CC Learning outcomes please check the DQP Intellectual Skills Areas of Learning. These also may be embedded in the PLOs but this is optional. Remember we will be using the AAC&U Value Rubrics. I have attached Word copies of these rubrics*.

   Updated department assessment plan attached (Appendix C). The learning outcome statements:
   - Students will be able to speak about their work with precision, clarity and organization (Oral Communication).
   - Students will be able to write about their work with precision, clarity and organization (Written Communication).
   - Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand (Information Literacy).
   - Students will be able to gather relevant information, examine information and form a conclusion based on that information (Critical Thinking).
   - Students will be able to understand and can create arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (Quantitative Reasoning).

7. *Criteria for success with rationale for each CC*

   For our departmental rubrics for Written and Oral Communication:
   80% of the students will have an average score of 2.5 or more. We expect the majority of our students to be in what we term “high satisfactory” (3) or “excellent” (4). This is based on the notion that average performance has a score of 2.5.

   The AAC&U rubrics seem to be setting the bar lower than MICS. We have aligned the categories between the two rubrics (described in Appendix B). We will experiment with setting the bar at 80% of the students will score a 3 or higher in the composite categories and see how that aligns with our assessment with departmental rubrics.

   Thus for the AAC&U Value Rubrics, our goal is that 80% of our students will be at a 3 or higher.

   MICS Rubrics can be seen as part of the assignment in Appendix A
   Crosswalk for Oral and Written Communication in Appendix B

APPENDIX A
ASSIGNMENTS WITH RUBRICS

First Assignment Information:
Oral Communication
Written Communication
Information Literacy
Critical Thinking

Assignment Description: This is a two part assignment. Students are asked to prepare and oral presentation and write a paper that integrates their knowledge from their course of study: Computer Science, Computer Information Systems or Mathematics. The basis for these talks and papers is generally each student's experience working on a year-long research project, a year-long service learning project or an internship (all graduates from our department must complete at least one of these three activities).

Each student is assigned an advisor with whom they meet regularly to work on preparing the paper and the oral report. Ultimately it is the rubrics that provide the details for the necessary components in the paper and oral presentation. Because faculty juries assess both the oral presentation and the paper, all are familiar with the rubrics and can assist students in understanding the expectations. These rubrics have been refined over many years based on what has been learning by the faculty through the process of mentoring students and scoring student work.

Note that the instructions for this assignment are in the process of being updated and extended for more general use as part of the NILOA Assessment Library. This work will be completed in June of 2014.

Senior Seminar Written and Oral Report:

Near the start of the semester you will work with a faculty member in your major to select a topic for giving a written (min 9 pages including abstract, bibliography, and table of contents) and an oral (20 minutes) report. This should be done using technology and terminology standard to your discipline. The reports will be scored by faculty using a rubric (which is attached to the end of this syllabus). Your topic must include things that you have learned outside of regular coursework.

You may report on your honors thesis, your service learning project, your internship, or a topic from your discipline that you want to learn more about. If the report is based on work done with a group, you must do your own unique presentation and report. The material must not overlap substantially with material presented by others in the class. It may be necessary to do additional work or to concentrate on different aspects of your project. Be sure to discuss this with your advisor before working on your report or presentation.

Please note that you must meet the deadlines for the preparation of your report and your oral presentation. To monitor your progress, you need to have your advisor initial each of the steps in the schedule below.

Student/Advisor Sign-off Sheet

Due date	Actual Date	Item	Advisor Signature or in class
Jan 14	_____	Advisor contacted/ possible topics discussed	_____
Jan 28	_____	Topic finalized, background material gathered, Resource justification completed (see IL rubric)	_____
Feb 11	_____	Abstract, bibliography, outline	_____
Mar 11	_____	Paper draft for peer review Discuss how rubrics align with paper	_in class_____
Mar 18	_____	Paper and PPT Drafts to advisor Self-assessment using rubrics due to advisor	_____
Mar 25		PRESENTATIONS BEGIN	
April 8	_____	Final Written report	_in class_____
TBD Randomly	_____	Final PowerPoint	_in class_____

Advisors will not sign off for an item unless it appears to them that the expected amount of time, as defined below, has been spent on each item

Background Reading/ abstract	10 hours
In-depth reading / outline prep	6 hours
1st paper draft	5 hours
PowerPoint draft	4 hours
Paper/PPT revisions	3 hours

For each day that an assignment with either an advisor or in-class deadline is late, **one page will be added to the length of the written report.** For example, if the abstract is 2 days late, and the PowerPoint draft is 1 day late, you will have to write 3 extra pages.

Extra pages = _____

The rubrics use a 1-4 grading scale with 4 being a high score. You will not pass if you receive an average of less than 2.5 on either your written report or your oral report.

MICS Oral Presentation Rubric Update (5/2/12)

Criteria	Outstanding	High Satisfactory	Low Satisfactory	Unsatisfactory
Command of background material	☐ Clearly knows material and key facts by memory	☐ Clearly knows key facts with a few memory slips	☐ Reads some information; knows some facts from memory	☐ Reads sentences from slides
	☐ Expands on PPT slides	☐ Some expansion on PPT slides	☐ No expansion of PPT slide content	☐ Dependent on notes
	☐ Content appropriate for audience	☐ Partial audience adaptation of content	☐ Little audience adaptation of content	☐ Lacks audience adaptation of content
Organization	☐ Clear and concise outline	☐ Clear outline	☐ Some sense of outline	☐ No clear outline
	☐ Relevant graphics and key text items on slides	☐ Too much information on slides (not concise)	☐ Too much detailed information on slides	☐ Slides are in paragraphed; too much detailed information on one slide
	☐ Presentation length is +/- 30 seconds of time limit	☐ +/- 1 minute of time limit	☐ +/- 1:30 of time limit	☐ +/- 2 minutes of time limit
Oral Presentation skills	☐ Clearly has practiced several times; smooth transitions	☐ Has practiced but transitions are not smooth	☐ Has practiced presentation but cannot verbally make transitions between slides	☐ Clearly did not practice presentation; Does not anticipate content of next slide
	☐ Engages audience in content multiple time and engagement is well connected to talk (questions, examples, etc)	☐ Engages audience at least twice in content (questions, examples, etc.)	☐ Audience engagement at least once with content (questions, examples, etc.)	☐ No audience involvement
	☐ Free of disfluencies (ah, uhm)	☐ A few disfluencies (ah, umh, er)	☐ Many disfluencies (ah, umh, er)	☐ Disfluencies (ah, umh, er) detract from presentation
	☐ Is clearly heard in the room and uses inflection for emphasis	☐ Can be understood most of the time and uses some inflection	☐ Can sometimes be understood and uses little inflection	☐ Can not be heard and/or speaks in a monotone
	☐ Engaged audience through eye contact	☐ Some engagement of audience through eye contact	☐ Infrequent eye contact	☐ Little audience awareness or eye contact
	☐ Engaged audience through gestures	☐ Some engagement of audience through gestures	☐ Distracting gestures or mannerisms	☐ Frequent distracting gestures or mannerisms
Use of Presentation Tools	☐ PPT background is matched to content, legible font, seamless transitions	☐ Appropriate PPT slide backgrounds, transitions & font	☐ Distracting PPT slide backgrounds and transitions, font hard to read	☐ No attention given to PPT slide backgrounds and transitions, font illegible
	☐ Graphics imbedded and matched to topic, necessary hyperlinks work	☐ Most graphics imbedded and matched to topic, most necessary hyperlinks work	☐ Some inappropriate graphics or use of PPT embellishments, necessary hyperlinks don't work	☐ Distracting use of embellishments, graphics not connected to topic
Ability to field questions	☐ Able to answer questions clearly and without hesitation and prepared material to answer anticipated questions	☐ Can answer all questions with some hesitation	☐ Able to answer half of the questions with hesitation	☐ Unable to answer any questions

MICS Written Presentation Rubric (5/2/12)

Criteria	Outstanding	High Satisfactory	Low Satisfactory	Unsatisfactory
Bibliography and supporting documents	☐ Multiple references from distinct reputable sources	☐ Most references from distinct reputable sources	☐ Some references from reputable sources	☐ No bibliography or all references from untrusted sites on the internet
	☐ References cited in the body of the document	☐ Some citation of references in the body of the document	☐ Limited citation of references in the body of the document	☐ No citation of references in the body of the document
Organization	☐ Conveys a central theme with all ideas connected, arrangement of ideas clearly related to topic	☐ Conveys a central idea or topic with some ideas connected to the topic	☐ Attempts to focus on an idea or topic with many ideas not connected to the topic	☐ Has little or no focus on central idea or topic
	☐ Clear introduction, body (with sections), and conclusion includes summary and closure	☐ Includes introduction, body and conclusion	☐ Introduction, body, conclusion detectable but not clear	☐ Introduction, body or conclusion absent
	☐ Includes both an abstract and table of contents	☐ Includes abstract and table of contents (one partial and one complete)	☐ Includes partial abstract and partial table of contents	☐ No abstract or table of contents
Grammar and spelling	☐ No use of first- person tense	☐ Few uses of the first-person tense	☐ Several uses of the first- person tense	☐ Written in first-person tense
	☐ No grammatical or spelling errors	☐ Few grammatical and spelling errors	☐ Some grammatical and spelling errors	☐ Many grammatical and spelling errors
Depth of information	☐ Appropriately synthesizes information from multiple distinct sources	☐ Synthesis of information from at least three distinct sources	☐ Synthesis of information from at least two distinct sources	☐ Summary reporting of information without synthesis
	☐ Draws conclusions and personal insights from synthesis	☐ At least two personal insights or conclusions stated	☐ At least one personal insight or conclusion stated	☐ No personal insights
	☐ Has the minimum number of pages including penalty pages; subject coverage is excellent	☐ Has the minimum number of pages including penalty pages; subject coverage is good	☐ Has the minimum number of pages including penalty pages; subject coverage is adequate	☐ Does not have the minimum number of pages including penalty pages
Clarity of writing	☐ Sentences flow	☐ Good sentence structure	☐ Occasional poor sentence structure	☐ Frequent poor sentence structure
	☐ Smooth transitions between paragraphs	☐ Adequate transitions between paragraphs	☐ Transitions between paragraphs unclear	☐ Lacked transitions between paragraphs
	☐ Any and all terms and acronyms are defined	☐ Most terms and acronyms are defined	☐ Some terms and acronyms are defined	☐ Many terms and acronyms are undefined
	☐ Provides evidence to support points	☐ Lacks support for some points	☐ Provides minimal support for points	☐ Ideas not supported

MICS Information Literacy Rubric (Starting Spring 2015)

Adapted from the AAC&U Value Rubric – gray sections indicate modifications for MICS

	Capstone - 4	Milestone - 3	Milestone - 2	Benchmark - 1
Determine the Extent of Information Needed	Effectively defines the scope of the research question or thesis. Effectively determines key concepts. Types of information (sources) selected directly relate to concepts or answer research question.	Defines the scope of the research question or thesis completely. Can determine key concepts. Types of information (sources) selected relate to concepts or answer research question.	Defines the scope of the research question or thesis incompletely (parts are missing, remains too broad or too narrow, etc.). Can determine key concepts. Types of information (sources) selected partially relate to concepts or answer research question.	Has difficulty defining the scope of the research question or thesis. Has difficulty determining key concepts. Types of information (sources) selected do not relate to concepts or answer research question.
Access the Needed Information	Accesses information using effective, well-designed search strategies and most appropriate information sources.	Accesses information using variety of search strategies and some relevant information sources. Demonstrates ability to refine search.	Accesses information using simple search strategies, retrieves information from limited and similar sources.	Accesses information randomly, retrieves information that lacks relevance and quality.
Evaluate Information and its Sources Critically	Thoroughly explains the reasons for the their selection of sources which includes information about how quality was judged. Indicates one source that was rejected.	Can explain the reason for selecting most sources.	Can explain the reason for selecting some sources.	Shows an emerging awareness of the varying quality of sources..
Use Information Effectively to Accomplish a Specific Purpose	Communicates, organizes and synthesizes information from sources to fully achieve a specific purpose, with clarity and depth	Communicates, organizes and synthesizes information from sources. Intended purpose is achieved.	Communicates and organizes information from sources. The information is not yet synthesized, so the intended purpose is not fully achieved.	Communicates information from sources. The information is fragmented and/or used inappropriately (misquoted, taken out of context, or incorrectly paraphrased, etc.), so the intended purpose is not achieved.
Access and Use Information Ethically and Legally	Students use correctly all of the following information use strategies (use of citations and references; choice of paraphrasing, summary, or quoting; using information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution) and demonstrate a full understanding of the ethical and legal restrictions on the use of published, confidential, and/or proprietary information.	Students use correctly three of the following information use strategies (use of citations and references; choice of paraphrasing, summary, or quoting; using information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution) and demonstrates a full understanding of the ethical and legal restrictions on the use of published, confidential, and/or proprietary information.	Students use correctly two of the following information use strategies (use of citations and references; choice of paraphrasing, summary, or quoting; using information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution) and demonstrates a full understanding of the ethical and legal restrictions on the use of published, confidential, and/or proprietary information.	Students use correctly one of the following information use strategies (use of citations and references; choice of paraphrasing, summary, or quoting; using information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution) and demonstrates a full understanding of the ethical and legal restrictions on the use of published, confidential, and/or proprietary information.

MICS Critical Thinking Rubric (Starting Spring 2015)

Adapted from the AAC&U Value Rubric – gray sections indicate areas that were modified to be appropriate for MICS.

	Capstone – 4	Milestone -3	Milestone - 2	Benchmark -1
Explanation of issues	Issue/problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.	Issue/problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/evaluation. Viewpoints of experts are taken as fact, without question.
Context	Students can explain thoroughly how their work fits into the larger context of the discipline	Students can make a connection between their project and the larger context for their work.	Students can identify the larger context of their work.	Students show an emerging awareness that their work is situated in a larger context.
Student's findings and their limitations	Students can articulate the limitations of their findings. Indicates areas “for further study.”	Students can articulate the limitations of their findings or had areas “for further study” but not both.	Students can articulate at least one limitation of their work	Students show an emerging understanding that their work has limitation.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student’s informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Second Assignment
Quantitative Literacy

Part A: Resume Exercise

It is important to make sure that the resume that you use for job applications has been adjusted to reflect what it important to as prospective employer (you may in fact create a slightly modified resume for each job application). Employers, particularly in technical fields, are interested in both hard and soft skills. Hard skills are those that can easily be recognized from the academic content of your education (e.g. Java programming, data analysis, accounting, Excel use). Soft skills can be defined as those skills used in human interaction (e.g. communication, teamwork).

Your resume should reflect your abilities in both soft and hard skills. This exercise is to help you refine your resume.

Define Job: Select one job type of job for which you want to apply (system administrator, actuary, teacher, software engineer).

Search Out Job Listings: Log on to monster.com, indeed.com, or a similar employment website. Search for a job in the community where you want to live. Peruse 8 job listings from different companies, paying attention to the hard and soft skills listed. Hard skills are often listed in the job description, where soft skills are often listed in the qualifications section, but they may be intermixed.

Collect Skills Data: Create an Excel spreadsheet that has a list of hard and soft skills similar to that listed below (you will have actual skills replacing the HS# and SS# labels). You should have at least 6 hard skills and 6 soft skills.

Skills	Times Encountered
hard	
HS1	
HS2	
HS3	
HS4	
HS5	
HS6	
HS7	
soft	
SS1	
SS2	
SS3	
SS4	
SS5	
SS6	
SS7	

Each time you encounter a soft or hard skill in the listing, add it to your spreadsheet, or increment the number of times encountered. For example, the first time you encounter something like “team player” in a job listing, add it to the soft skills list (replacing SS1) and put 1 in the column next to it. The next

time you see “team player” or something like it, you will just add 1 to the count. Use a single category for things that seem similar to you. Written and verbal communication are different, but “presentation skills” would be similar to verbal communication. I expect that each job requisition will have multiple soft and hard skill requirements.

Collect Salary Data: Record the starting salary for each of the 8 positions that you research. Note that is a range is given, you will be starting at the bottom end of that range. Compute the average starting salary based on this information.

Consider the Skills Data: Create graphs that will help you answer the following questions.

- What are the most important soft skills?
- What are the most important hard skills?
- Do employers of those in the job you chose value hard or soft skills more?

Update Your Resume: Describe how you have updated your resume to base on the information that you gathered in this exercise. Attach a copy of your updated resume.

Rubric areas: Interpretation, Representation, Calculation, Application

Part B: Financial Life

This exercise asks you to give a bit of advance thought to your finances once you graduate. Let's suppose that five years after graduation, you are going to need to have $20,000 in cash for a major expense (new car, down payment on a home, etc.).

You will need to gather the following information (this may take a bit of research):

- Starting salary (use the average from the resume activity)
- The monthly payment on your school loans. You will need to have a chat with PLNU financial aid to get this value. If you have no loans, then state that in your final report.
- Any other debts that you must pay off (car payment, credit card debt, etc.)

Create a spreadsheet that has the following features:

		Year 1	Year 2	Year 3	Year 4	Year 5
	INCOME:					
1	Salary					
2	Taxes and Benefits (35% of salary)					
3	Net Salary					
	EXPENSES					
4	School loan payments					
5	Car payment (if you have one)					
6	Other debt payment (if you have them)					
7	Contribution to church/charity					
8	Living Expenses					
9	Savings					

Note that you should assume that your pay will go up about 4% per year each year and that expenses will go up at roughly 2% per year (cost of living).

What to turn in:

- The spreadsheet
    - Income – expenses = 0
    - Savings total (adding up the savings for five years) = 20,000
- An explanation for how you arrived at the amount on each expenses line (numbers 4-9)
    - Be sure to include a clear justification for how you arrived at the cost of your living expenses (a guess is not an answer – this should include some estimates rooted in reality).

Rubric areas: Interpretation, Calculation, Analysis, Assumptions, Communication

MICS Quantitative Literacy Value Rubric (Starting Spring 2015)

	Capstone – 4	Milestone -3	Milestone - 2	Benchmark -1
Interpretation *Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)*	Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information. *For example, accurately explains the trend data shown in a graph and makes reasonable predictions regarding what the data suggest about future events.*	Provides accurate explanations of information presented in mathematical forms. *For instance, accurately explains the trend data shown in a graph.*	Provides somewhat accurate explanations of information presented in mathematical forms, but occasionally makes minor errors related to computations or units. *For instance, accurately explains trend data shown in a graph, but may miscalculate the slope of the trend line.*	Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means. *For example, attempts to explain the trend data shown in a graph, but will frequently misinterpret the nature of that trend, perhaps by confusing positive and negative trends.*
Representation *Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)*	Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.	Competently converts relevant information into an appropriate and desired mathematical portrayal.	Completes conversion of information but resulting mathematical portrayal is only partially appropriate or accurate.	Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate.
Calculation	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.)	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.	Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.	Calculations are attempted but are both unsuccessful and are not comprehensive.
Application / Analysis *Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis*	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for workmanlike (without inspiration or nuance, ordinary) judgments, drawing plausible conclusions from this work.	Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work.
Assumptions *Ability to make and evaluate important assumptions in estimation, modeling, and data analysis*	Explicitly describes assumptions and provides compelling rationale for why each assumption is appropriate. Shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions.	Explicitly describes assumptions and provides compelling rationale for why assumptions are appropriate.	Explicitly describes assumptions.	Attempts to describe assumptions.
Communication *Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)*	Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explicates it with consistently high quality.	Uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explication may be uneven.	Uses quantitative information, but does not effectively connect it to the argument or purpose of the work.	Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (May use quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities.)

APPENDIX B
CROSS-WALK BETWEEN AAC&U AND MICS RUBRICS

Mapping from MICS Oral Presentation Rubric to AAC&U Oral Communication Rubric

The score for each element of the AAC&U Value Rubric is created by taking an average of each of the components of the MICS Rubric that is mapped (see arrows) to the given AAC&U rubric category.

AAC&U Category	MICS Rubric Item Used to Create the Score
Organization *Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.*	Clear and concise outline Relevant graphics and key text items on slides Presentation length is +/- 30 seconds of time limit PPT background is matched to content, legible font, seamless transitions
Language *Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.*	Engages audience in content multiple time and engagement is well connected to talk (questions, examples, etc) Expands on PPT slides Content appropriate for audience
Delivery *Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.*	Clearly has practiced several times; smooth transitions Free of disfluencies Is clearly heard in the room and uses inflection for emphasis Engaged audience through eye contact Engaged audience through gestures
Supporting Material *A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/authority on the topic.*	Graphics imbedded and matched to topic, necessary hyperlinks work Relevant graphics and key text items on slides Clearly knows the material and facts by memory
Central Message *Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)*	Clearly knows material and key facts by memory Clear and concise outline

Mapping from MICS Written Presentation Rubric to AAC&U Written Communication Rubric

The score for each element of the AAC&U Value Rubric is created by taking an average of each of the components of the MICS Rubric that is mapped (see arrows) to the given AAC&U rubric category.

AAC&U Category	MICS Rubric Item
Context of and Purpose for Writing *Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).*	Conveys a central theme with all ideas connected, arrangement of ideas clearly related to topic
Content Development	Appropriately synthesizes information from multiple distinct sources Draws conclusions and personal insights from synthesis Provides evidence to support points
Genre and Disciplinary Conventions *Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields (please see glossary).*	Clear introduction, body (with sections), and conclusion includes summary and closure Includes both an abstract and a table of contents
Sources and Evidence	Multiple references from distinct reputable sources References cited in the body of the document
Control of Syntax and Mechanics	Uses no first-person tense No grammatical or spelling errors Sentences flow Smooth transitions between paragraphs Any and all terms and acronyms are defined

APPENDIX C
ASSESSMENT PLAN

LEARNING OUTCOMES ASSESSMENT PLAN
DEPARTMENT OF MATHEMATICAL, INFORMATION AND COMPUTER SCIENCES
Updated March 2014

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.

Program Learning Outcomes (Teach):

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

   Means of Assessment (annual): CSC254 Signature Assignment

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

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

   Means of Assessment (every 2 years): CSC314 Signature Assignment

   Criteria for Success: 80% of the students should have an average score of at least 7.

3. Students will use information management as a tool to support decision making in business environments.

   Means of Assessment (every 2 years): ISS414 Signature Assignment

   Criteria for 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 develop characteristics necessary to be effective members of the communities where they work and live.*

Program Learning Outcomes (Shape):

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

   Means of Assessment (every 2 years): ISS414 Signature Assignment.

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

5. Students will be able to speak about their work with precision, clarity and organization (Oral Communication).

   Means of Assessment (annual): Each student will be required to give a 20-minute oral presentation on a topic in their field as a part of their participation in the Senior Seminar. 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 4 (outstanding) to 1 (unsatisfactory) in the following areas:
   - Command of background material
   - Organization
   - Oral presentation skills (added as part of the new rubric in the spring of 2010)
   - Use of presentation tools
   - Ability to field questions from the audience

   Note that the department has a mapping between its rubric and the AAC&U Oral Communication Value Rubric.

   Criteria of Success: 80% of the students should have an average score of at least 2.5 in each of the major areas in the department rubric. This translates to 80% of the students being above a 3 in the AAC&U rubric.

6. Students will be able to write about their work with precision, clarity and organization (Written Communication).

   Means of Assessment (annual): Each student will be required to write a paper on a topic in their field as a part of their participation in the Senior Seminar. 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 4 (outstanding) to 1 (unsatisfactory) in the following areas:
   - Bibliography and other supporting documentation
   - Organization
   - Grammar and spelling
   - Depth of information
   - Clarity of writing

   Note that the department has a mapping between its rubric and the AAC&U Written Communication Value Rubric.

   Criteria of Success: 80% of the students should have an average score of at least 2.5 in each of the major areas in the department rubric. This translates to 80% of the students being above a 3 in the AAC&U rubric.

7. Students will collaborate effectively in teams.

   Means of Assessment (annual): CSC324 Signature Assignment (assignment and rubric to be developed).

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

8. Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand (Information Literacy).

   Means of Assessment (annual): Each student will be required to write a paper on a topic in their field as a part of their participation in the Senior Seminar. 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 4 (capstone) to 1 (benchmark) in the following areas:
   - Determine the Extent of Information Needed
   - Access the Needed Information
   - Evaluate Information and its Sources Critically (carefully explains the reason for the choice of sources).
   - Use Information Effectively to Accomplish a Specific Purpose
   - Access and Use Information Ethically and Legally

   Criteria for Success: 80% of the students should have an average score of at least 3 in each of the major areas.

9. Students will be able to gather relevant information, examine information and form a conclusion based on that information (Critical Thinking).

   Means of Assessment (annual): Each student will be required to write a paper on a topic in their field as a part of their participation in the Senior Seminar. 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 4 (capstone) to 1 (benchmark) in the following areas:
   - Explanation of issues
   - Evidence: Selecting and using information to investigate a point of view or conclusion
   - Context (students can explain how their work fits into the larger context of the discipline).
   - Student's position and findings (can clearly explain their findings and the limitations of their work)
   - Conclusions and related outcomes (implications and consequences)

   Criteria for Success: 80% of the students should have an average score of at least 3 in each of the major areas.

10. Students will be able to understand and create arguments supported by quantitative evidence, and they can clearly communicate those arguments in a variety of formats (Quantitative Reasoning).

    Means of Assessment (annual): Each student will be required to complete a quantitative reasoning assignment as part of Senior Seminar. The students will be given the evaluation criteria with their assignment and will rated by the faculty using a rubric with a scale of 4 (capstone) to 1 (benchmark) in the following areas:
    - Interpretation: Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)
    - Representation: Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)
    - Calculation
    - Application / Analysis: Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis
    - Assumptions: Ability to make and evaluate important assumptions in estimation, modeling, and data analysis
    - Communication: Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)

    Criteria for Success: 80% of the students should have an average score of at least 3 in each of the major areas.

Department Learning Outcome (Send): *We believe that work is an act of service. Graduates will be prepared to serve a complex world through their technical and professional abilities.*

Program Learning Outcomes (Send):

11. Computer Information Systems graduates will be adequately prepared for entry into graduate school or jobs in the computing profession.

    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 25th percentile on the exam.

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

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.

Program Learning Outcomes (Teach):

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

   Means of Assessment (annual): CSC254 Signature Assignment

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

2. Students will use the theory of algorithms and computation to solve problems.

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

   Criteria for Success: The department subscore will be at the 65th percentile or higher.

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

   Means of Assessment (annual): ETS Major Field Test in Computer Science: Computer Organization, Architecture and Operating Systems subscore and CSC314 Signature Assignment.

   Criteria for Success:
   ETS: The department subscore will be at the 65th percentile or higher.
   CSC314*:* 80% of the students should have an average score of at least 7.

Department Learning Outcome (Shape): *Students will develop characteristics necessary to be effective members of the communities where they work and live.*

Program Learning Outcomes (Shape):

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

   Means of Assessment (every 2 years): CSC493 Signature Assignment (assignment and rubric to be developed)

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

5. Students will be able to speak about their work with precision, clarity and organization (Oral Communication).

   Means of Assessment (annual): Each student will be required to give a 20-minute oral presentation on a topic in their field as a part of their participation in the Senior Seminar. 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 4 (outstanding) to 1 (unsatisfactory) in the following areas:
   - Command of background material
   - Organization
   - Oral presentation skills (added as part of the new rubric in the spring of 2010)
   - Use of presentation tools
   - Ability to field questions from the audience

   Note that the department has a mapping between its rubric and the AAC&U Oral Communication Value Rubric.

   Criteria of Success: 80% of the students should have an average score of at least 2.5 in each of the major areas in the department rubric. This translates to 80% of the students being above a 3 in the AAC&U rubric.

6. Students will be able to write about their work with precision, clarity and organization (Written Communication).

   Means of Assessment (annual): Each student will be required to write a paper on a topic in their field as a part of their participation in the Senior Seminar. 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 4 (outstanding) to 1 (unsatisfactory) in the following areas:
   - Bibliography and other supporting documentation
   - Organization
   - Grammar and spelling
   - Depth of information
   - Clarity of writing

   Note that the department has a mapping between its rubric and the AAC&U Written Communication Value Rubric.

   Criteria of Success: 80% of the students should have an average score of at least 2.5 in each of the major areas in the department rubric. This translates to 80% of the students being above a 3 in the AAC&U rubric.

7. Students will collaborate effectively in teams.

   Means of Assessment (annual): CSC324 Signature Assignment (assignment and rubric to be developed).

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

8. Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand (Information Literacy).

   Means of Assessment (annual): Each student will be required to write a paper on a topic in their field as a part of their participation in the Senior Seminar. 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 4 (capstone) to 1 (benchmark) in the following areas:
   - Determine the Extent of Information Needed
   - Access the Needed Information
   - Evaluate Information and its Sources Critically (carefully explains the reason for the choice of sources).
   - Use Information Effectively to Accomplish a Specific Purpose
   - Access and Use Information Ethically and Legally

   Criteria for Success: 80% of the students should have an average score of at least 3 in each of the major areas.

9. Students will be able to gather relevant information, examine information and form a conclusion based on that information (Critical Thinking).

   Means of Assessment (annual): Each student will be required to write a paper on a topic in their field as a part of their participation in the Senior Seminar. 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 4 (capstone) to 1 (benchmark) in the following areas:
   - Explanation of issues
   - Evidence: Selecting and using information to investigate a point of view or conclusion
   - Context (students can explain how their work fits into the larger context of the discipline).
   - Student's position and findings (can clearly explain their findings and the limitations of their work)
   - Conclusions and related outcomes (implications and consequences)

   Criteria for Success: 80% of the students should have an average score of at least 3 in each of the major areas.

10. Students will be able to understand and create arguments supported by quantitative evidence, and they can clearly communicate those arguments in a variety of formats (Quantitative Reasoning).

    Means of Assessment (annual): Each student will be required to complete a quantitative reasoning assignment as part of Senior Seminar. The students will be given the evaluation criteria with their assignment and will rated by the faculty using a rubric with a scale of 4 (capstone) to 1 (benchmark) in the following areas:
    - Interpretation: Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)
    - Representation: Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)
    - Calculation
    - Application / Analysis: Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis
    - Assumptions: Ability to make and evaluate important assumptions in estimation, modeling, and data analysis
    - Communication: Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)

    Criteria for Success: 80% of the students should have an average score of at least 3 in each of the major areas.

Department Learning Outcome (Send): *We believe that work is an act of service. Graduates will be prepared to serve a complex world through their technical and professional abilities.*

Program Learning Outcomes (Send):

11. Computer Science graduates will be adequately prepared for entry into graduate school or jobs in the computing profession.

    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 50^{th} percentile on the exam.

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

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

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.

Program Learning Outcomes (Teach):

1. Students will be able to demonstrate facility with analytical concepts.

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

   Criteria for Success: The department subscore will be at the 65th percentile or higher

2. Students will be able to write proofs.

   Means of Assessment (annual): MTH242 Signature Assignment

   Criteria for Success: 80% of the students to score a 2.5 or higher (on a scale of 1-4) in each of the four areas:
   - Statement of the problem
   - Logic
   - Symbolism
   - Justification

3. Students will be able to demonstrate facility with algebraic structures.

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

   Criteria for Success: The department subscore will be at the 65th percentile or higher

Department Learning Outcome (Shape): *Students will develop characteristics necessary to be effective members of the communities where they work and live.*

Program Learning Outcomes (Shape):

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

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

   Criteria for Success: The department subscore will be at the 65th percentile or higher

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

   Means of Assessment (annual): MTH382 Signature Assignment and CSC254 Signature Assignment

   Criteria for Success: MTH382: 80% of the students should have an average score of at least 2.5 in each of the major areas.
   CSC254: 80% of the students should have an average score of at least 2.5 in each of the major areas.

6. Students will be able to speak about their work with precision, clarity and organization (Oral Communication).

   Means of Assessment (annual): Each student will be required to give a 20-minute oral presentation on a topic in their field as a part of their participation in the Senior Seminar. 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 4 (outstanding) to 1 (unsatisfactory) in the following areas:
   - Command of background material
   - Organization
   - Oral presentation skills (added as part of the new rubric in the spring of 2010)
   - Use of presentation tools
   - Ability to field questions from the audience

   Note that the department has a mapping between its rubric and the AAC&U Oral Communication Value Rubric.

   Criteria of Success: 80% of the students should have an average score of at least 2.5 in each of the major areas in the department rubric. This translates to 80% of the students being above a 3 in the AAC&U rubric.

7. Students will be able to write about their work with precision, clarity and organization (Written Communication).

   Means of Assessment (annual): Each student will be required to write a paper on a topic in their field as a part of their participation in the Senior Seminar. 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 4 (outstanding) to 1 (unsatisfactory) in the following areas:
   - Bibliography and other supporting documentation
   - Organization
   - Grammar and spelling
   - Depth of information
   - Clarity of writing

   Note that the department has a mapping between its rubric and the AAC&U Written Communication Value Rubric.

   Criteria of Success: 80% of the students should have an average score of at least 2.5 in each of the major areas in the department rubric. This translates to 80% of the students being above a 3 in the AAC&U rubric.

8. Students will collaborate effectively in teams.

   Means of Assessment (annual): MTH352 Signature Assignment (assignment and rubric to be developed).

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

9. Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand (Information Literacy).

   Means of Assessment (annual): Each student will be required to write a paper on a topic in their field as a part of their participation in the Senior Seminar. 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 4 (capstone) to 1 (benchmark) in the following areas:
   - Determine the Extent of Information Needed
   - Access the Needed Information
   - Evaluate Information and its Sources Critically (carefully explains the reason for the choice of sources).
   - Use Information Effectively to Accomplish a Specific Purpose
   - Access and Use Information Ethically and Legally

   Criteria for Success: 80% of the students should have an average score of at least 3 in each of the major areas.

10. Students will be able to gather relevant information, examine information and form a conclusion based on that information (Critical Thinking).

    Means of Assessment (annual): Each student will be required to write a paper on a topic in their field as a part of their participation in the Senior Seminar. 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 4 (capstone) to 1 (benchmark) in the following areas:
    - Explanation of issues
    - Evidence: Selecting and using information to investigate a point of view or conclusion
    - Context (students can explain how their work fits into the larger context of the discipline).
    - Student's position and findings (can clearly explain their findings and the limitations of their work)
    - Conclusions and related outcomes (implications and consequences)

    Criteria for Success: 80% of the students should have an average score of at least 3 in each of the major areas.

11. Students will be able to understand and create arguments supported by quantitative evidence, and they can clearly communicate those arguments in a variety of formats (Quantitative Reasoning).

    Means of Assessment (annual): Each student will be required to complete a quantitative reasoning assignment as part of Senior Seminar. The students will be given the evaluation criteria with their assignment and will rated by the faculty using a rubric with a scale of 4 (capstone) to 1 (benchmark) in the following areas:

    - Interpretation: Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)
    - Representation: Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)
    - Calculation
    - Application / Analysis: Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis
    - Assumptions: Ability to make and evaluate important assumptions in estimation, modeling, and data analysis
    - Communication: Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)

    Criteria for Success: 80% of the students should have an average score of at least 3 in each of the major areas.

Department Learning Outcome (Send): *We believe that work is an act of service. Graduates will be prepared to serve a complex world through their technical and professional abilities.*

Program Learning Outcome (Send):

12. Mathematics graduates will be adequately prepared for graduate study, teaching and careers using 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 50^{th} percentile on the exam.

    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**:** 80% of the students will have an average score of 2.5 or higher.

    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.