

Capstone II AY17 Program Review: Capstone Rubric & 2017 Aggregate Scores

MATHEMATICS

Assessment Type: Program

Year/Term: 2016-2017

Level: Mathematics Capstone Rubrics

Learning Outcome: Program Learning Outcomes (PLOs)

Assessment Method/Tool: Program Learning Outcomes Capstone Rubrics

Measurement Scale: P = Proficient; C = Competent; D = Developing

Sample Size: 7

Assessment results for MATH 407 – Mathematics Program Capstone – Spring 2017
(Assessments relate to the “Communication” and “Analysis & Inquiry” learning outcomes of the Mathematics program. Rubrics are attached below).

Spring Presentation: P = Proficient; C = Competent; D = Developing

	Organization	Verbal Communication	Depth of Content	Accuracy of Understanding	Use of Media
Student #1	P	C	C	C	P
Student #2	P	C	P	P	P
Student #3	P	P	C	C	P
Student #4	P	P	P	P	P
Student #5	C	C	C	C	P
Student #6	C	P	C	C	C
Student #7	P	P	P	P	P

Written Paper: P = Proficient; C = Competent; D = Developing

	Mathematical Notation	Depth and Accuracy	Concise Writing and Organization	Logical Flow	Referencing
Student #1	C	C	C	P	C
Student #2	P	P	P	P	P
Student #3	P	C	C	C	P
Student #4	P	P	P	P	P
Student #5	P	P	P	C	P
Student #6	C	C	C	P	P
Student #7	P	P	C	P	P

MATH 407 Rubric – used to capstone presentations

Criteria	Proficient	Competent	Developing
Organization (COMMUNICATION)	Presentation was well organized. The order and flow of the concepts and examples made the content easy to follow.	Presentation had a degree of organization, but multiple significant changes would have made the presentation more clear.	Presentation lacked organization to a degree where even the foundational concepts of the content were difficult to understand.
Effectiveness of Verbal Communication (COMMUNICATION)	Speech was clear and articulate. Mathematical terms were used accurately and appropriately.	Speech lacked some clarity, but not enough to disrupt understanding. Mathematical terms were, with few exceptions, used accurately and appropriately.	Speech was awkward to a point where it distracted from understanding. Mathematical terms were consistently misused.
Depth of Content (ANALYSIS/INQUIRY)	The content of the presentation was at a level that was both accessible and new to senior math majors at EOU.	The content of the presentation either had substantial overlap with content that would already be familiar to senior math majors at EOU or was at a level beyond what such an audience could be expected to understand with their prior knowledge.	The content of the presentation was entirely material routinely covered in EOU courses.
Accuracy of Understanding (ANALYSIS/INQUIRY)	Presenter demonstrated a complete understanding of all major concepts and minor details in the talk and was able to give clear answers to audience questions.	Presenter demonstrated a complete understanding of all major concept in the talk, but lacked significant understanding of some minor details and/or was unsure of answers to audience questions.	Presenter had a lack of understanding of at least one major concept in the talk and was unable to accurately answer listener questions.
Effective Use of Media (COMMUNICATION)	Use of classroom media (chalkboard, transparencies, Beamer slides, etc.) were clear and used effectively to convey the content of the presentation.	Use of classroom media was generally effective, but additional efforts in this regard would have made the presentation more clear.	The use of media was ineffective and distracted from the clarity of the presentation.

MATH 407 Rubric – used to evaluate capstone paper

Criteria	Proficient	Competent	Developing
Use of Mathematical Notation & Definitions (COMMUNICATION)	The paper uses accurate and appropriate mathematical notation, definitions, and terminology	Most, but not all, the notation, definitions, and terminology is used accurately. Errors are identifiable and correctable by a reader of experience similar to the author.	Notation, terminology, and/or definitions are frequently misused. The writer may use personal rather than standard notation. Missing definitions compromise the paper beyond repair.
Depth and Accuracy of Content (INQUIRY/ANALYSIS)	Selected topic was of a depth appropriate for a senior undergraduate math major, not duplicated in EOU course curriculum, and analyzed to a depth appropriate for the undergraduate level. Attempts at original mathematical research were clearly present.	Topic had modest overlap with EOU course curriculum, was at a depth appropriate for an undergraduate math major, but not at the senior level, or was analyzed to a depth that was somewhat lacking.	Topic had significant overlap with EOU course curriculum, or lacked depth or analysis appropriate for an undergraduate math major.
Concise Writing and Organization (COMMUNICATION)	The paper is well-organized and succinct, without inclusion of irrelevant definitions, theorems, or examples.	The paper is generally well-organized but includes some unnecessary definitions, irrelevant examples and/or theorems which distract from the overall flow.	The paper has multiple disconnected ideas with no clear flow or purpose.
Logical Flow (INQUIRY/ANALYSIS)	The paper presents a topic with a clear flow from introduction through examples and necessary proofs	The paper generally has a clear flow, but would be more comprehensible if topics had been reordered.	The paper is missing important topics to make its flow clear and understandable.
References (COMMUNICATION)	The paper accurately references necessary prior works.	Some references necessary to the deductions are missing, misused, or stated inaccurately.	References are generally lacking, or the theorems in question are stated inaccurately.

Closing the Loop

All seven (100%) Capstone students assessed during for the 2016-2017 year were judged to be Proficient or Competent in all assessed areas for Communication and Inquiry & Analysis for both their capstone presentation and final written paper. Particular strengths of the

class included presentation organization, logical flow of the capstone paper, correct use of mathematical notation and referencing, and effective use of media. In these areas a majority of the students achieved a Proficient rating.

There were some categories in which a majority of students were judged as Competent with only a minority rising to the level of Proficient. These included concise writing (for the paper) and depth and accuracy of understanding (for the presentation). While the organization and logical flow of the papers tended to be a strength, the relative weakness in terms of conciseness suggests that this should be a stronger focus of the draft editing process in future years, perhaps in conjunction with more effective use of resources in the Writing Center.

We currently also have a “draft” process for the Capstone presentation. At the end of winter term students give a short talk introducing the topic they are researching for spring. However, at the time of this presentation, students are usually not far enough along in their research that they can be given meaningful feedback about their accuracy of understanding. The other relatively weak areas may be improved by having students do an additional practice presentation in the spring, well before their final talk, to better identify issues for which students might need to improve their level of understanding. In fact, this is the usual procedure for the Capstone course when it contains few students, but the size of this year’s class did not allow enough time for all students to be able to do this, so the mechanism for content feedback was through one-on-one meetings during office hours instead.