

STLF Report to CWSEI and Mathematics Department

STLF: Joseph Lo

Period: 2012-08-06 – 2012-09-07

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Specific activities performed by STLF

- 1) Professional development
 - Attended STLF meetings (Aug 29)
 - Attended reading group (Aug 30)
- 2) Math SEI general meetings/activities
 - Met with Math-SEI group to review current projects and discuss future plans (Aug 9, 16, 30)
 - Met with Marc Fabbri from PSU to discuss about calculus workshops and basic skills test (Aug 17)
 - Met with Jim Carolan to review current projects and discuss future plans (Sept 6)
- 3) Course-specific meetings/activities

MATH 210 – Introduction to Mathematical Computing

- Brian Wetton will be the next instructor. We will have weekly meeting starting in September to go over the curriculum, the learning goals and the course materials.
- Programming techniques and applications will be the main focus of the course. Related course materials and activities will be developed.
- Last year, the majority of students completed the pre/co-requisite courses (first year calculus, introductory differential equations and linear algebra) more than a year before they took this course. Many of them had trouble remembering the required knowledge as they proceeded with the course. We plan to give a diagnostic in the beginning of the term and may provide pre-reading or review materials if necessary.

Math 200 – Calculus III

- I will be developing some pre-reading materials, graphical illustrations and online supplementary notes for Julia Gordon, one of the instructors of Math 200. The first pre-reading material and assignment will be released on Tuesday, Sept 11. Surveys on these materials will be given during the term to gather information about usage and student comments.
- A diagnostic on first-year calculus materials was given on Sept 6 to measure students' retention on calculus knowledge. Approximately 56% of the students have completed Calculus II in Spring 2012 and 13% in Spring 2011. Results will be provided in the next report.

Math 221 – Matrix Algebra

- I am responsible for developing Webwork assignments for all sections of Math 221. The instructors will choose most of the questions (hopefully) from the public problem library and some from the textbook or other sources. Most basic routine-type problems could be found in the library, but the quality of the randomization process within these problems needs to be checked. We found that, for some problems, the random generator may result in a loss of an important property required for solving those problems. For example, a

problem may have no verification procedures that can prevent a singular matrix to be generated by the randomization process when a non-singular matrix is desired. A question chosen from textbook or other sources will need to be programmed to Webwork.

- Another difficulty arisen from linear algebra is that a correct answer might have different forms and the answer checker needs to accept all possible forms. For example, a line in 3-space can be represented by a vector equation using any point on the line and any vector parallel to the line, or alternatively any two non-parallel planes that contains the line.
- I will be responsible for answering all technical questions from students. One of the course TAs is assigned to answer all other course-related questions.

Infinite series diagnostic

- The series diagnostic is given in Math 257/316 this term as an ungraded homework. We expect that most of the students this year took Math 101 in or after Spring 2011 when the series module is added to the curriculum. We would like to measure students' retention on their series skills. Results will be provided in the next report.

Mathematics Attitudes and Perceptions Survey (MAPS)

- Warren, Sandi and I have come up with a revised version of MAPS based on the results of all student and expert validation gathered in summer. We do not expect further changes in the questions, but may delete some after more student validations in the future.
- We would like to give this survey online to Math 100/180, 104/184, 200 and 221 during the second or third week of classes. We plan to offer two prizes of \$50 gift card from the bookstore to attract more responses.

Current project status (material prepared by either STLTF or other members of the MATH SEI)

MATH 110:

Learning Goals: 3rd draft of learning goals is complete.

Assessments: MAPS/Study Habit survey and Post-diagnostic was completed

New Methods/Materials: New problem-solving based workshops, remedial work on basic skills

MATH 210:

Learning Goals: Revised after the course is over. A possible new version will be created with the input of the new instructor

Assessments: End-of-term survey was done.

New Methods/Materials: The MATLAB module is new. Redevelopment of course materials on Maple is complete.

MATH 305:

Learning Goals: Complete

Assessments: Final exam done.

New Methods/Materials: None at this point

MATH 200:

Learning Goals: None at this point

Assessments: A diagnostic on calculus materials is given on the first day.

New Methods/Materials: Pre-reading and supplementary online materials are being developed throughout the term.

MATH 221:

Learning Goals: None at this point

Assessments: None at this point.

New Methods/Materials: Webwork assignments will be developed throughout the term.

Plan for immediate future work

MATH 200:

1. Develop pre-reading materials
2. Code the diagnostic and provide results to the instructor

MATH 221:

1. Develop Webwork assignments

Infinite series diagnostic:

1. Code the diagnostic and provide results to the instructor

Mathematics Attitudes and Perception Survey:

1. Set up the online survey
2. Ask the instructors-in-charge for permission to run in their courses
3. Invite more students for validation