Course: Math 010 The Art and Practice of Mathematics

1. Date of Application: 12/2/2011
2. Name, Dept of Proposer: Math dept, Mathematics and Computer Science
3. Name of Dept/Program housing course: Mathematics and Computer Science
4. Name of Chair/PD: Chris Jones
5. How often is the course taught:semesterly
6. Course Prerequisites:High school algebra II and geometry, Sem 20 or 110, and Eng 5
7. Unit value of course:1
8: Normal Class Size: 18
9. Number of sections expected Fall 2012:2
10. Number of sections expected Spring 2013:2
11. Is the course appropriate for first-year students: Yes
12. Relevant Learning Goal(s):Mathematical Understanding
13. Chair will oversee submission of student work: Yes
14. Chair will oversee instructor participation in norming/asst: Yes

15. Teaching: "While the content for Math 10 varies by choice of the instructor, the following, specific to a current offering, typifies the embodiment of the course's pursuit of the Mathematical Understanding goal.

Learning outcomes for Math 10 are numbered in the attached sample syllabus. Although the schedule of topics in this course is malleable, here are some specific examples of how we guide students to achieve each of those goals.

1.   Clarifying the concept of infinite helps students make a transition from mystery to precision. The struggles of Cantor, the architect of the study of infinite, bring forth the intellectual drama of acceptance of new ideas. They also ponder on why it took so long to discover non-Euclidean geometries.
2.   The history of apportionment systems for the house of representatives, as well as the study of ranking methods of voting involve the student in a real application of mathematics. Similarly the study of proportion in art.
3.   Students are asked to think about their financial future and analyze annuity saving plans.
Or determine when is convenient to buy and when to rent a house in the Bay Area.
4.   Depending on the semester, students are introduced to elementary coding theory or theory of networks.
5.   Students analyze arguments using symbolic logic. They examine model deductive proofs: direct proofs and proofs by contradiction to appreciate how carefully mathematical knowledge is built. They distinguish between valid and invalid arguments.
6.   Some examples are: the use of dimension in ?Flatland?; the use of non-orientable surfaces in science fiction; the use of randomness in the ?The Maltese Falcon?
7.   Daily, the instructor models the translation of a problem to mathematical language with student participation.
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16. Learning: "Again the following statement is specific to a current offering, but reflective of the conduct of a typical offering of Math 10.

Students are assigned daily homework, which is collected and graded. They complete several in-class exams and write some short papers. This strengthens the achievement of learning goals 3 and 7. They give some presentations and sometimes participate in seminar style discussions. Their understanding is enhanced by in-class geometric constructions. The

questions in the exams are designed to assess the student?s fluency in the use of notation and conceptual understanding of the subject matter. The exam questions can be tailored to coincide with each learning outcome.

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