Mathematical and Physical Sciences (MPS) 2013-2014 Assessment Report

I. Executive Summary: MPS met informally and virtually often throughout the year to evaluate students and program. Mainly we focused on the CS (Computer Science) major and students but we kept everyone in mind. Two years ago we had decided to construct an alternative CS minor that might appeal to nontraditional audiences and to seek permanent staffing to help address CS course needs. Unfortunately this effort was thwarted by the unexpected departure of Professor Moore last summer and the consequent scrambling to continue the existing programming.

II. ASSESSMENT REWIEW AND PLANNING MEETING: Professors Heinekamp and Stiadle met on May 1 from 1:30 to 2:30 pm to review current student progress and to discuss the structure of our majors (Computer Science (CS), Math, and Physics). At the principal meeting, however, we evaluated the progress of senior majors, current underclass majors, and potential majors, identifying individual problems as well as overall issues to address. We also continued the ongoing discussion of lack of structure in the CS major. We are offering CS courses, which is not the same as a CS major. On the other hand, we all agree, including Admissions, that we have to offer a CS major in the 20th century let alone the 21st. Moreover, there has been an identified, ongoing problem of communication skills among CS students Polling of students indicates that CS cannot be limited to a specific niche such as graphic design or gaming. Students are interested in all sorts of things and, indeed, ought to be empowered to move among various CS venues due to changing needs. In five years HS students may be building everyone's web pages and games. Conversely, a good database requires serious mathematical preparation in order to be workable. That's college material that we must require and provide.

III. PLAN FOR NEXT YEAR We continue to identify and to address four major issues.

(1) There have been very few CS minors in the last few years. Physics minors go up and down and Math minors are variable but fairly stable. The recent CS pattern seems persistent, however. We believe this is due to a high entry-level cost. Moreover, the minor itself is currently structured as half of a standard major, which may not address students' needs from other majors, e.g. Business, Psychology, and Graphic Design. Assuming staffing, we plan to propose some new minors that address these various needs.

(2) Many MPS students including, perhaps especially, among our CS majors seem impervious to low grades as a source of motivation for tasks, concepts, and communications skills they do not currently wish to learn. While some of this may be due to maturity issues, it is a departure from recent behaviors.

(3) In light of last summer's unexpected departure of Assistant Professor Moore, we took the opportunity to revisit again the structure of the CS major. We considered course offerings, structure, and staffing. Alas, we still suffer from understaffing in this realm.

(4) Given the tendency toward more applied offerings, especially as minors, MPS should explore some of these possibilities, such as a Statistics minor, which would appeal to the social sciences and business. Here again, staffing is the major impediment.

IV. UPDATED ASSESSMENT PLAN

(1) The major plans to develop other versions of the CS minor so as to dovetail effectively with the Business, FMS, and Graphic Design majors, among others. In addition, we hope to get consistent, effective, user-friendly staffing for the introductory programming class, CS 131, even if this is not necessarily the entry-level class for all minors or majors.

(2) Experience shows that students will perform on projects in which they're invested, so we can sometimes address the issue with targeted projects. This is, however, impractical for large classes and for every single concept. Moreover, it does not address the maturity problem relevant for jobs. Finally, it diverges from our liberal arts appeal to "things will change." This warrants our further study and continued consideration this coming year, as it was not practical to address it this year.

(3) A survey of current CS majors revealed no clear pattern of immediate job interest (database, web-development, programming, etc.) This is gratifying in the sense that it's consistent with the liberal arts approach mentioned above as well as the College and major liberal arts goals. Thus MPS recommends no changes in the major requirements at this time other than continuing to keep pace with industry standards. This is, for CS as well as Math and Physics of course, impossible without faculty practice outside academia.

(4) MPS is preparing proposals for a second CS minor in Web Development and a Math minor in Statistics so as to accommodate student interest in applications that will go along with their majors in Business, Economics, Psychology, Natural Sciences, and others.

(5) The department has advocated for and is searching for an additional member who will fill the position vacated by Professor Moore, although not necessarily in an equivalent role. Rather, such a person should be able to teach effectively in an area in addition to CS such as Math or Physics. Not only ought this person be difficult to find, since a CS PhD who is a good teacher is a rare commodity for an institution such as ours to attract, but it allows for the flexibility in course offerings that we have traditionally encouraged.

V. SUMMARY OF DATA USED

(1) MPS has evaluated and continues to evaluate standard CS, Math, and Physics major requirements at other, comparable institutions as well as standards articulated by national bodies concerned with these subjects.

(2) As observed above, we polled current majors and have informally spoken with first year students who expressed interest in our area but stopped after one semester. The new policy of assigning students to advisors in the area of initial interest has definitely been helpful in this regard. While it's natural for students to try out a major and then change their minds after a semester or two,

knowing the problems of the few who might continue in an MPS major or minor can help us tailor our program to serve all students better.