This proposal requests approval for nominal changes in supporting areas for mathematics majors, as well as the addition of one 400-level course as one of those allowed for the Statistics Track. Please see attachment for details.

Please see attachment.
December 19, 2003

MEMORANDUM

TO: Stephen Halperin
Dean, College of Computer, Mathematical and Physical Sciences

FROM: Victor Korenman
Associate Provost for Academic Planning and Programs

SUBJECT: Proposal for Nominal Changes in Supporting Areas for Math Majors, and Addition of a Course to the Statistics Track (PCC Log No. 03022)

After consultation with Dr. Sylvester J. Gates, Jr., Chair of the Senate PCC Committee, I have approved your proposal for nominal changes in supporting areas for math majors and the addition of a course to the statistics track. A copy of the approval proposal is enclosed.

The change is effective immediately. The College should ensure that the new requirements are fully described in the next edition of the Undergraduate Catalog and in all relevant descriptive materials, and that all advisors are informed.

VK: sfm
Enclosure

Cc: Dr. Sylvester J. Gates, Jr., Chair, Senate PCC
Dr. Mary Giles, University Senate
Ms. Barbara Hope, Data Administration
Dr. Phyllis Peres, Undergraduate Studies
Ms. Anne Turkos, Archives
Dr. Scott Wolpert, College of Computer, Mathematical and Physical Sciences
Dr. Linda Yokoi, Records & Registrations
JUSTIFICATION/REASONS/RESOURCES

Justification is included for those changes not involving Physics and Computer Science that are due to changes in their courses and numbering.

FOR THE TRADITIONAL TRACK:

#4. should read: One course from CMSC 106, 114, 131 or ENEE 114, or PHYS 165. Student may be exempt from this requirement if he or she can demonstrate adequate programming knowledge from prior course or work experience.

Change/Rationale: PHYS 165 is added to the list of courses allowed in #4, because it is deemed equivalent to CMSC 131 and ENEE 114. (Note that the second sentence is changed to correct grammar, etc. )

#5. (f) should read: BMGT 220-221, and one of BMGT 340, 343

Change/Rationale: The change to (f) involves the addition of BMGT 343 as an alternative 3rd course in the sequence. The rationale for such a change is that mathematics majors are allowed to register for BMGT 343 without the catalogue prerequisite BMGT 430. BMGT 343 contains an overview of investments, and is reasonable as one of the triad of supporting courses in Business.

FOR THE SECONDARY EDUCATION TRACK

#4. should read: One course from CMSC 106, 114, 131 or ENEE 114, or PHYS 165. Student may be exempt from this requirement if he or she can demonstrate adequate programming knowledge from prior course work experience.

Change/Rationale: PHYS 165 is added to the list of courses allowed in #4, because it is deemed equivalent to CMSC 131 and ENEE 114.

FOR THE STATISTICS TRACK:

#3 (ii) should read: MATH 351, 411, 412, 414, 420, 424, 464.

Change/Rationale: Addition of MATH 424 to the list. The newly labeled MATH 424 (Introduction to Mathematics of Finance) has STAT 400 or BMGT 231 as prerequisite, and has linear algebra and differential equations as advisable prerequisites. Thus the course is suited to be in the Statistics Track.

#4. should read: One course from CMSC 106, 114, 131 or ENEE 114, or PHYS 165. Student may be exempt from this requirement if he or she can demonstrate adequate programming knowledge from prior course work experience.

Change/Rationale: PHYS 165 is added to the list of courses allowed in #4, because it is deemed equivalent to CMSC 131 and ENEE 114.
Admission
All Materials Science and Engineering students must meet admission, progress, and retention standards of the A. James Clark School of Engineering.

Advising
Students choosing materials science and engineering as their major or materials engineering as their primary or secondary field of concentration should contact Dr. Kathleen Hart, the Undergraduate Programs Coordinator, Room 1113, Chemical and Nuclear Engineering Building, at (301) 405-5989. Dr. Hart can set up appointments with Professors Lloyd, Martinez-Miranda, and Wilson, the Undergraduate Advisors. Any questions about the program should be directed to Dr. Ramesh Ramamoorthy, Undergraduate Studies Director.

Co-op Program
The Materials Science and Engineering program works within the A. James Clark School of Engineering Cooperative Engineering education Program. For details, see the A. James Clark School of Engineering entry in chapter 6.

Financial Assistance
Financial Aid based upon need is available through the Office of student Financial Aid. Faculty Merit Scholarships are offered to outstanding students by the department. Other scholarships are available through the A. James Clark School of Engineering. The department offers opportunities for research internships with faculty.

Honors and Awards
Each of the large number of professional-materials-oriented societies such as the metallurgical and ceramic societies sponsor awards to recognize outstanding scholarship and undergraduate research. All students enrolled in the materials engineering program are encouraged to select a faculty adviser who in their junior and senior years will guide them towards nomination for these awards. Awards from MRS, TMS Societies are available.

Student organization: There is an active student chapter of The Minerals, Metals & Materials Society (TMS).

Course Code: ENMA

Nuclear Engineering Program (ENNU)
2309 Chemical and Nuclear Engineering Building, (301) 405-5832
www.mne.umd.edu

Professor and Chair: Christou

Use of Nuclear Engineering as a field of concentration in the Bachelor of Science in Engineering program has been suspended for the time being.

MATHEMATICS (MATH)
College of Computer, Mathematical and Physical Sciences
1117 Mathematics Building, Undergraduate Office, (301) 405-5053
www.math.umd.edu/

Professor and Chair: Fitzpatrick


Assistant Professors: Dolzmann, B., Haines, Li, Ramachandran, Trivisa, Yu

Professors Emeriti: Alexander, Auslander, Babuska††, Brace, Corbel, Edmundson, Ehrlich, Goldberg, Goldhaber, Good, Heins, Horvath, Hubbard, Hummel, Kellogg, Kirwan, Kleppner, Lehner, Markley, Neri, Olver, Owings, Syski, Zedek

Associate Professors Emeriti: Sather, Schneider

Affiliate Professors: O’Leary, Stewart, Young

Adjunct Professor: Rinzel

††Distinguished Scholar Teacher

††Distinguished University Professor

** Joint Appointment: Department of Curriculum and Instruction

***Joint Appointment: IPST

†Director, AMSC

††Director, CSC AMM

!!!Associate Dean, CMPS

!!!!Dean, CMPS

!!!!!!Chancellor, USM

The program in mathematics leads to a degree of Bachelor of Science in mathematics and offers students training in preparation for graduate work, teaching, and positions in government or industry. Mathematical training is integrated with computer use in several courses. Because a strong mathematical background is important in several fields, over a third of UMCP mathematics majors are double majors. Additional information on these topics and mathematics is available from the department website.

Requirements for Major
There are three tracks for the major, the traditional track the secondary education track, and the statistics track. The secondary education track is for students seeking to become certified to teach mathematics at the secondary level. Each mathematics major must complete each required course with a grade of C or better.

TRADITIONAL TRACK

Major Requirements:

1. The introductory sequence MATH 140,141,240, 241 or the honors sequence MATH 350-351. Completion of MATH 340 satisfies the requirement for MATH 241; completion of MATH 340-341 satisfies the requirement for MATH 240-241.

2. One of the courses MATH 246, 341, 414, 415, 436, 462.

3. Eight MATH/AMSC/STAT courses at the 400-level or higher, at least four of which are taken at College Park. The eight courses must include:
   (a) At least one course from MATH 401, 403, 405.
   (b) One course from AMSC 460,466.
   (c) MATH 410 (completion of MATH 350-351 exempts the student from this requirement and (e) below; students receive credit for two 400-level courses.) Students are strongly encouraged to complete MATH 310 prior to attempting MATH 410.
   (d) A one-year sequence which develops a particular area of mathematics in depth, chosen from the following list:
      (i) MATH 410-411
      (ii) MATH 410-412
      (iii) MATH 403-404
      (iv) MATH 403-405
      (v) MATH 446-447
      (vi) STAT 410-420
   (e) The remaining 400-level MATH/AMSC/STAT courses are electives, but cannot include any of: MATH 400, 461, 478, or STAT 464. Also, students with a strong interest in applied mathematics may, with the approval of the Undergraduate Office, substitute two courses (with strong mathematics content) from outside the Mathematics Department for one upper-level elective course.

4. One course from CMSC 106, 114 or ENEE 114. Students may be exempt from this requirement if he or she can demonstrate adequate programming knowledge from prior course work experience.

5. One of the following supporting three-course sequences. These are intended to broaden the student’s mathematical experience. Other sequences might be approved by the Undergraduate Office but they would have to make use of mathematical ideas, comparable to the sequences on this list.
   (a) (i) PHYS 161-262-263.
   (ii) PHYS 171-272-273
   (iii) PHYS 141-142, and an upper-level physics course approved by the Mathematics Department
Major Requirements:

1. The introductory sequence MATH 140,141,240, 241 or the honors sequence MATH 350-351. Completion of MATH 340 satisfies the requirement for MATH 241; completion of MATH 340-341 satisfies the requirement for MATH 240-241.
2. One of the courses MATH 246, 341, 401, 420, 452, 462 or AMSC 460 or 466.
3. Seven MATH/AMSC/STAT courses at the 400-level or higher, at least four of which are taken at College Park. The seven courses must include:
   (a) MATH 410 (completion of MATH 350-351 exempts the student from this requirement; students receive credit for two 400-level courses.) Students are strongly encouraged to complete MATH 310 prior to attempting MATH 410.
   (b) MATH 402 or MATH 403
   (c) MATH 430
   (d) STAT 400 or STAT 410
   (e) At least one course from MATH 406, 445, 446, 447, 450, 456 or 475.

The remaining 400-level MATH/AMSC/STAT courses are electives, but cannot include any of: MATH 400, 461, 478, or STAT 464.

4. One course from CMSC 106,114 or ENEE 114. Student may be exempt from this requirement if the student demonstrates adequate programming knowledge from prior course or work experience.

5. At least one course from MATH 406, 445, 446, 447, 450, 456 or 475.

6. One of the following supporting two course sequences. These are intended to broaden the student's mathematical experience.
   (a) CHEM 103 and 104
   (b) CHEM 103 and 113
   (c) PHYS 221 and 222
   (d) PHYS 161 and 262
   (e) PHYS 141 and 142
   (f) BSCI 105 and 106
   (g) ASTR 200 and a second 3-credit ASTR course, excluding ASTR 100, 101, 110, and 111.
   (h) METO 200 and 201, and any 400 level METO course.
   (i) GEOL 100 and 110, and one of GEOL 322 or GEOL 341.

The student-teaching pair EDCI 450-451 is 15 credits and has further prerequisites in the College of Education. In order to take these courses the student must be admitted into the College of Education. A student in the secondary education track of the mathematics major would normally be expected to receive a double major in Mathematics and Mathematics Education.

STATISTICS TRACK

Major Requirements:

1. The introductory sequence MATH 140,141,240, 241 or the honors sequence MATH 350-351. Completion of MATH 340 satisfies the requirement for MATH 241; completion of MATH 340-341 satisfies the requirement for MATH 240-241.
2. One of the courses MATH 246, 341 and 414.
3. Eight additional courses, at least four of which must be taken at College Park. The eight courses are prescribed as follows:
   (a) One course from MATH 410 and 350
   (b) One course from AMSC 460 and 466
   (c) One course from MATH 401 and 405
   (d) STAT 410
   (e) One course from STAT 401 and 420
   (f) STAT 430
   (g) Two additional courses from the following list:
      (i) Any 400-level or higher STAT courses except STAT 464
      (ii) MATH 351, 411, 412, 414, 420, 464
      (iii) AMSC 477
      (iv) BIOM 402

4. One course from CMSC 106, 114 or ENEE 114. Student may be exempt from this requirement if the student demonstrates adequate programming knowledge from prior course or work experience.

5. One of the three-course supporting sequences listed in the “Traditional Track” above (part 4).

AREAS OF STUDY

Within the Department of Mathematics there are a number of identifiable areas which students can pursue to suit their own goals and interests. They are briefly described below. Note that they do overlap and that students need not confine themselves to one of them.

1. Pure mathematics: the courses which clearly belong in this area are: MATH 402, 403, 404, 405, 406, 411, 414, 415, 417, 430, 432, 436, 437, 445, 446, 447, 452, STAT 410, 411, 420. Students preparing for graduate school in mathematics should include MATH 403, 405, 410 and 411 in their programs. MATH 463 (or 660) and MATH 432 (or 730) are also desirable. Other courses from the above list and graduate courses are also appropriate.

2. Secondary teaching: When selecting the seven courses for the Secondary Education Track, students are encouraged to choose those courses which are required for certification to teach mathematics at the secondary level: MATH 402 or 403, MATH 430, and STAT 400. The following additional courses are particularly suited for students preparing to teach: MATH 401, MATH 406, MATH 445, and MATH 475.

3. Statistics: For a student with a Bachelors degree seeking work requiring some statistical background, the minimal program is STAT 400-401. To work primarily as a statistician, one should combine STAT 400-401 with STAT 430 and at least one more statistics course, most suitably, STAT 440 or STAT 450. A stronger sequence is STAT 410, 420, 430. This offers a better understanding and wider knowledge of statistics and is a general core course (i.e., does not specify one area of application). For economics applications STAT 400, 401, 430, 440, 450, and AMSC 477 should be considered. For operations research AMSC 477 and/or STAT 411 should be added or perhaps substituted for STAT 450. To prepare for graduate work, STAT 410 and 420 give the best background, with STAT 405, 411, 430, 440, 450 added at some later stage.

4. Computational mathematics: there are a number of math courses which emphasize the computational aspects of mathematics including the use of the computer. They are AMSC 460, 466, MATH 431, 450, 456, 475 and STAT 430. Students interested in this area should take CMSC 114, 214 as early as possible, and CMSC 420, 211 are also suggested.

5. Applied mathematics: the courses which lead most rapidly to applications are the courses listed above in 3 and 4 and MATH 401, 412, 414, 415, 420, 431, 436, 462, 463, 464, and MATH/AMSC 420 and 472. A student interested in applied mathematics should obtain, in addition to a solid training in mathematics, a good knowledge of at least one area in which mathematics is currently being applied. Concentration in this area is good preparation for employment in government and industry or for graduate study in applied mathematics.

Advising

Advising for math majors is mandatory. Students are required to sign up for an advising appointment at the math undergraduate office window (1117 Mathematics Building), beginning the week before preregistration.

Honors

The Mathematics Honors Program is designed for students showing exceptional ability and interest in mathematics. Its aim is to give a student the best possible mathematics education. Participants are selected by the Departmental Honors Committee during the first semester of their junior year. A precise statement of the requirements may be found at www.math.umd.edu/undergraduate/opportunities