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LIBERAL STUDIES

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Number: 98-35
Submission Date: _____
Action-Date: W – 12/11/98

CURRICULUM PROPOSAL COVER SHEET
University-Wide Undergraduate Curriculum Committee

I. CONTACT

Contact Person Gerald Buriok Phone 7-2608

Department Mathematics

II. PROPOSAL TYPE (Check All Appropriate Lines)

_____ **COURSE** _____
Suggested 20 character title

____ New Course* _____
Course Number and Full Title

____ Course Revision _____
Course Number and Full Title

____ Liberal Studies Approval+ for new or existing course _____
Course Number and Full Title

____ Course Deletion _____
Course Number and Full Title

____ Number and/or Title Change _____
Old Number and/or Full Old Title

_____
New Number and/or Full New Title

____ Course or Catalog Description Change _____
Course Number and Full Title

__X__ **PROGRAM:** _____ Major _____ Minor __X__ Track

____ New Program* _____
Program Name

__X__ Program Revision* Applied Mathematics
Program Name

____ Program Deletion* _____
Program Name

____ Title Change _____
Old Program Name

_____
New Program Name

III. Approvals (signatures and date)

Department Curriculum Committee — 10/1/98

Department Chair — 10/5/98

College Curriculum Committee — 11/2/98

College Dean — 11/02/98

+Director of Liberal Studies (where applicable)

*Provost (where applicable) — 11/3/98

Part II. Description of Curriculum Changes
1. Catalog description for the revised program in the appropriate form.

Bachelor of Science - Applied Mathematics

Liberal Studies: As outlined in Liberal Studies Section with the following specifications: Mathematics: (included in major) Liberal Studies electives: no courses with MA prefix			**50-52**
Major:			**40-41**
Required courses:			
MA 123	Calculus I for Physics, Chemistry, Mathematics	4 sh	
MA 124	Calculus II for Physics, Chemistry, Mathematics	4 sh	
MA 171	Introduction to Linear Algebra	3 sh	
MA 216	Probability/Statistics for Natural Sciences	4 sh	
MA 241	Differential Equations	3 sh	
MA 271	Introduction to Mathematical Proofs I	3 sh	
MA 272	Introduction to Mathematical Proofs II	3 sh	
MA 480	Senior Seminar	1 sh	
Controlled electives (1)			
Two courses from list: MA 371, 421, 422, 423, 424, 427, 476, 477		6 sh	
One of the following two-course sequences: MA342/CO450 or CO 451 or MA 451, MA 363/364, MA 445/446		6-7 sh	
Specified Elective: One of the controlled elective listed above or MA 353, MA 425, MA 447, MA 465, MA 481		3 sh	
Other Requirements:			**6-12**
CO 110	Problem solving and Structured Programming	3 sh	
CO 250	Introduction to Numerical Methods	3 sh	
Foreign Language Intermediate Level (2)		0-6 sh	
Free Electives:			**19-28**
Total Degree Requirements:			**124**

(1) A student may select courses to fulfill requirements for specialized track.
(a) Actuarial/Statistics: MA363, 364, 366, 371, 421, 446 ,465
(b) Math Analyst: /Engineering: MA342, CO450 or CO 451 or MA 451,371, 423, 447
(c) Operations Research: MA371, 421, 445, 446, 447
(2) Intermediate-level Foreign Language may be included in Liberal Studies electives.

Present Program specialized tracks for Bachelor of Science-Applied Math	**Proposed Program specialized tracks for Bachelor of Science-Applied Math**
Students may select courses to fulfill requirements for specialized track.	Students may select courses to fulfill requirements for specialized track.
Actuarial/Statistics: MA363, 364, 421, 422, 446, 465	Actuarial/Statistics: MA363, 364, 366, 371, 421, 446, 465
Scientific/Engineering: MA241, 342, 363, 364, 371, 423, 445, 446	Math Analyst: /Engineering: MA342, CO450, or CO 451 or MA 451, MA 371, 423, 447
Math Analyst: MA241, 342, 363, 364, 371, 445, or 446, 476, CO minor	Operations Research: MA371, 421, 445, 446, 447

2. Summary of Changes:

Old Track	New Track
Actuarial/Statistics:	**Actuarial/Statistics:**
MA363 Math Statistics I (3 sh)	MA 363 Math Statistics I (3 sh)
MA364 Math Statistics II (3 sh)	MA 364 Math Statistics II (3 sh)
	MA 366 Prep for Actuarial Exam (1 sh)
	MA 371 Linear Algebra (3 sh)
MA421 Advanced Calculus I (3 sh)	MA421 Advanced Calculus I (3 sh)
MA 422 Advanced Calculus II (3 sh)	
MA 446 Prob. Models for O.R. (3 sh)	MA446 Prob. Models for O.R. (3 sh)
MA465 Topics in Statistics.(3 sh)	MA465 Topics in Statistics.(3 sh)
Scientific/Engineering:	**Math Analyst: /Engineering**
MA241 Differential Equations (3 sh)	
MA342 Advncd Math for Applctns (4 sh)	MA342 Advncd Math for Applications (4 sh)
	CO450 Applied Numerical Methods (3 sh)
	or CO/MA451 Num. Methds for Supercompters(3cr)
MA 363 Math Statistics I (3 sh)	
MA 371 Linear Algebra (3 sh)	MA 371 Linear Algebra (3 sh)
MA 423 Complex Variable I (3 sh)	MA423 Complex Variable I (3 sh)
MA445 Programming Models for O.R. (3 sh)	
MA 446 Prob. Models for O.R. (3 sh)	
	MA447 Simulations Models (3 sh)
Math Analyst:	
MA241 Differential Equations (3 sh)	
MA342 Advncd Math for Applications(3 sh)	
MA 363 Math Statistics I (3 sh)	
MA 364 Math Statistics II (3 sh)	
MA 371 Linear Algebra (3 sh)	
MA445 Programming Models for O.R. (3 sh)	
or	
MA 446 Prob. Models for O.R. (3 sh)	
CO minor (6 to 9 additional sh)	

Operations Research
MA 371 Linear Algebra (3 sh)
MA 421 Advanced Calculus I (3 sh)
MA 445 Programming Models for O.R. (3 sh)
MA446 Prob. Models for O.R. (3 sh)
MA 447 Simulations Models (3 sh)

b. List of all associated course changes:
We are changing the suggestions that we are making for our specialized tracks within the Applied Mathematics Program.

1. Within the Actuarial/Statistics track we are suggesting,
   the addition of MA 366 Preparation of Actuarial Exam
   the addition of MA 371 Linear Algebra

   the deletion of MA 422 Advanced Calculus II

2. We have merged two tracks, Scientific/engineering and Math Analyst, into one, Math Analyst/ Engineering.

3. We have created a new track, Operations Research.

c. Rationale for Change.

Note, these tracks are only suggestions to the students and it is not required that one of them be chosen. The tracks are intended to provide the students with a feel for the issues they will confront in specific job settings. It is our recommendations to our advisees that they get as broad a background as possible.

1. The change in courses within the Actuarial/Statistics track reflects the content needed to successfully complete the actuarial exams.

2. We have merged two tracks, Scientific/Engineering and Math Analyst since the two tracks were virtually identical. In the newly formulated track, MA 241, was removed since it is now a requirement of the major, MA 363 was removed since statistics is not a major tool of engineers or analysts, MA 445 and MA 466 were moved to the Operations Research track CO 450 and MA 447 were added because the skills are necessary to engineers and analysts.

3. Trends in industry and the addition of faculty members with expertise in this area have made Operations Research a viable track for our majors.

Part III. Implementation

1. **How will the proposed revision affect students already in the existing program?**

   Since these tracks are suggestions rather than requirements, students within the existing program may choose to follow either the old or the new tracks, or any combination as they wish.

2. **How will the proposed revision affect faculty teaching loads? Have additional faculty been authorized? If you are adding requirements, how will adequate seats be provided?**

   Teaching load will not be affected.

3. **Are other resources adequate? (Space, equipment, supplies, travel funds)**

   Other resources are adequate.

4. **Do you expect an increase or decrease in the number of students as a result of these revisions? If so, how will the department adjust?**

   Number of students should not be affected by these changes.