LSC Use Only
Number: _____
Submission Date: _____
Action-Date: _____

UWUCC USE Only
Number: 97-35c
Submission Date: _____
Action-Date: app. 12/16/97
Senate app. 2/3/98

CURRICULUM PROPOSAL COVER SHEET
University-Wide Undergraduate Curriculum Committee

I. **CONTACT**

Contact Person __Gerald Buriok__ Phone __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: __X__ Major   _____ Minor   _____ Track

_____ New Program* _____
                                    Program Name

__X__ Program Revision* __Economics/Mathematics__
                                    Program Name

_____ Program Deletion* _____
                                    Program Name

_____ Title Change _____
                                    Old Program Name

                        _____
                                    New Program Name

III. **Approvals (signatures and date)**

_____Gerald A. Buriok___ 9/14/97   _____Gerald Buriok___ 9/14/97
Department Curriculum Committee   Department Chair

_____ 10/15/97   _____John D. Eck___ 10/15/97
College Curriculum Committee   College Dean

                                         _____ 10/21/97
-Director of Liberal Studies (where   *Provost (where applicable)

15

Part II. Description of Curriculum change

1. Catalog description for the revised program in the appropriate form:

Bachelor of Arts - Economics/Mathematics

Liberal Studies: As outlined in Liberal Studies section   47-49
with the following specifications:
Social Science: EC121(included in major)
Mathematics: MA123 (Included in Major)
Electives: Intermediate foreign language.
no course with EC or MA prefix.

Major: 53-55
Core:

EC121	Principles of Economics I	3sh
EC122	Principles of Economics II	3sh
EC421	Macroeconomics Analysis	3sh
EC422	Microeconomics Analysis	3sh
MA123	Calculus I for Physics, Chemistry, and Mathematics	4sh
MA124	Calculus II for Physics, Chemistry, and Mathematics	4sh
MA171	Introduction to Linear Algebra	3sh
MA216 *or* EC355 Statistics		3-4sh

Economics Electives: 12
Students are especially encouraged to take EC334
Economics of Corporate Decisions and EC356
Econometrics. but any course except EC101
Basic Economics may be used. EC493 Internship
in Economics may be counted only with the approval of the
program coordinator. and only up to 6 semester hours.

Mathematics Electives: 15-16
At least one of the following two-semester sequences:
MA241   Differential Equations *and*
MA371   Linear Algebra
MA363 *and* MA364 Mathematical Statistics I and II
MA445 *and* MA446 Programming and Probabilistic
               Models in Operations Research
**Three additional courses either from the above or
from the following:**
MA271   Introduction to Mathematical Proofs I
MA272   Introduction to Mathematical Proofs II
MA342   Advanced Mathematics for Applications
MA417   Statistical Applications *or*

MA418	Sampling Survey Theory
MA421	Advanced Calculus I
MA422	Advanced Calculus II
MA423	Complex Variables I
MA425	Applied Mathematical Analysis I
MA427	Introduction to Topology
MA451	Numerical Methods for Supercomputers
MA465	Topics in Statistics
MA476	Abstract Algebra I
MA477	Abstract Algebra II

Other Requirements: 0

Free Electives: 20-24
Total Degree Requirements: 124

2. Summary of changes:

   a. Table comparing old and new programs

   Required courses:

Old Program	New Program
EC121 Principles of Economics I	EC121 Principles of Economics I
EC122 Principles of Economics II	EC122 Principles of Economics II
EC421 Macroeconomics Analysis	EC421 Macroeconomics Analysis
EC422 Microeconomics Analysis	EC422 Microeconomics Analysis
MA127 Calculus I	
MA128 Calculus II	
MA227 Calculus III	
	MA123 Calculus I for Physics, Chemistry, and Math
	MA124 Calculus II for Physics, Chemistry, and Math
MA171 Intro to Linear Algebra	MA171 Intro to Linear Algebra
MA216 or EC355 Statistics	MA216 or EC355 Statistics
[30-31 sh required]	[26-27 sh required]

Economics Electives:
Students are especially encouraged
to take EC334 and EC356, but any
course except EC101 may be used.
EC493 may be counted only with
the approval of the program
coordinator.

Economics Electives:
Students are especially encouraged
to take EC334 and EC356, but any
course except EC101 may be used.
EC493 may be counted only with
the approval of the program
coordinator, and only up to 6 semester hours.

Mathematics Electives:
At least one of the following two-
semester sequences:
MA241 and MA371;
MA363 and MA364;
MA445 and MA446.
Two additional courses either from
the above or from the following:
MA271,342,417 or 418, 421,422,
423,425,427,465,476,477.

Mathematics Electives:
At least one of the following two-
semester sequences:
MA241 and MA371;
MA363 and MA364;
MA445 and MA446.
Three additional courses either from
the above or from the following:
MA271,272,342,417 or 418, 421,422,
423,425,427,451,465,476,477.

b. List of all associated course changes:

These courses will be deleted from the list of required courses:

MA127 Calculus I (4sh)
MA128 Calculus II (4sh)
MA227 Calculus III (4sh)

These courses will be added to the list of required courses:

MA 123 Calculus I for Physics, Chemistry, and Mathematics(4sh)
MA 124 Calculus II for Physics, Chemistry, and Mathematics (4sh)

The number of required mathematics courses is reduced by one, and the number
of mathematics electives a student must choose is increased by one. MA 272 has
been added to the list of acceptable electives. MA 451 has been added to the list
of acceptable electives.

At most 6 semester hours of EC493 Internship in Economics will be counted
toward the degree.

3. Rationale for Change:

One of the objectives of the various mathematics programs is to give students a
rigorous understanding of the nature of mathematic and mathematical proofs. As
part of this objective, the Mathematics Department has traditionally offered a
separate three semester calculus sequence specifically for its majors, including a
more rigorous, proof oriented presentation, while offering a "leaner", more
applications oriented two semester sequence for the rest of the sciences. In recent
years, the Mathematics Department has found this dual approach to be a
stumbling block in handling students wishing to transfer or change majors into
mathematics. On a number of occasions, students entering or leaving the major

midway through one of the calculus sequences has had to start a second sequence from scratch because of differences in pace or rigor. To address this problem, the Mathematics Department has decided to place all of its majors in the two semester calculus sequence for the sciences. To make up for the reduced exposure to mathematical proofs. the faculty has proposed expanding its one semester introduction to proofs course (the former MA 271 Algebraic Structures) into a two semester sequence (proposed as MA 271-272) and add a one credit senior seminar "capstone" course. The expanded proof sequence will contain the more theoretical material from the three semester calculus sequence. Moving this material into the "proof" courses will further benefit the students in that they will have had more time to mature mathematically before grappling with abstractions. Also, having mathematics majors and science majors in the same calculus sequence is more in line with mathematics curricula elsewhere in the nation.

In order to keep the proper balance between Economics and Mathematics in the program, the number of mathematics electives a student must choose has been increased from two to three. This is in line with the reduction by one of the number of required mathematics courses when the change from a three course calculus sequence to a two course calculus sequence is implemented. MA 272 was added to the list of acceptable electives because of its relationship to MA 271. MA 451 was added to the list of acceptable electives because it provides students with an opportunity to gain exposure to supercomputers.

Regarding the limitation of 6 semester hours of EC493 Internship in Economics, the Department of Economics has used this limit since the internship was instituted. Although an economics major may count up to 12 EC internship hours toward the 124 needed for graduation. only 6 may be counted toward the major in economics. The restriction to 6 in the Econ/Math program simply extends to students in that program what already exists for economics and pre-law majors. If a student could count 12 semester hours of internship toward the major. they could graduate without taking any upper level "field" courses in the department. It was always the intention to limit it to 6. and this was has been handled by the program coordinator. who must grant approval for counting any EC493 credits.

Part III.   Implementation.

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

The program revision will become effective with students entering the University in the fall of 1998. The Mathematics Department will offer MA 127, 128. and 227 during the 1998-99 academic year to allow students who are already part way through the sequence. or who need to repeat one of the classes. an opportunity to take the classes. After that. MA 127,128,227 will become inactive and eventually be removed from the master list of courses. Students already in the program will be permitted to take MA 272 as an elective if they completed the old MA 271.

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.

The affect on faculty teaching loads will be almost negligible. Here is a listing of current offerings and proposed offerings under the revised program.

	Current Course Offerings	Revised Course Offerings
Fall:	MA 123 (2-3 sections)	MA 123 (3-4 sections)
	MA 124 (1-2 sections)	MA 124 (2-4 sections)
	MA 127 (1 section)	
	MA 128 (1-2 sections)	
	MA 227 (1 section)	
	Total: (6 - 9 sections)	Total: (5-8 sections)
Spring:	MA 123 (2 sections)	MA 123 (4 sections)
	MA 124 (2 sections)	MA 124 (3 sections)
	MA 127 (2 sections)	
	MA 128 (1 section)	
	MA 227 (1 section)	
	Total: (8 sections)	Total: (7 sections)

Note: Since MA 227 is four credits. there will be a savings of four credits in faculty workload each semester. (The courses MA 123. 124. 127. 128. 227 are all four credit courses.) No additional faculty are necessary. Adequate seats will be provided by offering sections of MA 123 and 124 in place of current offerings of MA 127 and 128 respectively.

3. Are other resources adequate?

Yes. No other resources are needed.

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

We do not believe the revisions will have any impact on the number of students taking these courses.

Part IV.   Course Proposals

Attached.

Part V.   Letters of Support.

Attached.

October 15, 1997

To whom it may concern:

The Economics Department and the Mathematics Department have agreed to the proposed revisions in the Bachelor of Arts-Economics/Mathematics program. The Economics Department will submit the proposal to the curriculum committee of the College of Humanities and Social Sciences, while the Mathematics Department will submit the proposal to the curriculum committee of the College of Natural Sciences and Mathematics. Modifications recommended by these committees will included in the final proposal from both departments.

Donald Walker 10/17/97

Donald Walker, Chairperson
Economics Department

Gerald Buriok 10-15-97

Gerald Buriok, Chairperson
Mathematics Department

21