UNDERGRADUATE PROGRAM MODIFICATION PETITION

1. Attach a description of the program as it currently exists, including program title and specific requirements: Students pursuing a degree in Mathematics must complete eight required courses: Math 230, Calculus I; Math 330, Calculus II; Math 335, Calculus III; Math 253, Introduction to Mathematical Logic; Math 412, Abstract Algebra; Math 413, Linear Algebra; Math 435, Theory of Probability and Math 492, History of Mathematics. Students must also complete a minimum of four upper-level electives with one of the electives selected from Math 410, Introduction to Analysis; Math 433, Differential Equations or Math 432, Advanced Calculus. (Check sheet is attached.)

2. Proposed Program Title, if modified: not modified

3. Proposed Program Description, if modified: Students pursuing a degree in Mathematics must complete eight required courses: Math 230, Calculus I; Math 235, Calculus II; Math 335, Calculus III; Math 253, Introduction to Mathematical Logic; Math 362, Linear Algebra; Math 410, Introduction to Analysis; Math 412, Abstract Algebra; and Math 438, Theory of Probability. Students must also complete a minimum of 15 credit hours of upper-level math electives. (Check sheet is attached.)

4. Proposed Program Admission Requirements, if modified: not modified

5. Implementation Date: ☒ ☐ ☐ ☐ ☐ ☐ ☐ Fall Spring Summer I Summer II Summer III 2013 Year

6. Attach rationale for the program modification.

7. Department faculty signatures (majority required). If an interdisciplinary program, a majority of each department must sign this form. Number of Faculty in Dept(s) 10

Dari J. Mahler
Rita Hudson
Edly E. Hett
John Donnelly
Charlotte Wells
Kathy V. Rodgers
Dept. Chair

8. Sent to Chair of College Curriculum Committee: Date: 10/11/12

9. Received by Chair of College Curriculum Committee: Date: 10/11/12

College Curriculum Committee:
Approved ☒ Not Approved ☐

Signature: Chair of Committee Date: 10/11/12

10. Sent to the Dean of the College of Date: 10/11/12

Approved ☒ Not Approved ☐
Mathematics

Otta Donnelly
Seth J. Stelowich
Sara Zuerig
Ishuva Ballew
J. Whitehead
Cassie Anderson
A. Allen
A. Scott
Betty J. Blaho
Joyce Rubens
Robyn A. Semmersheim
Mary Krist
Katherine L. Cortt
11. Sent to originator:
   **Originator responsible for 12 through 13**
   Date: 10/1/12

12. Is the program a part, or to be a part, of teacher training?
   Yes ☑ No ☐
   If yes, have this signed by the Dean of Science and Engineering.
   Approved ☑ Not Approved ☐
   Date: 10/1/12

13. Sent to Provost Office.
   (Original plus an electronic copy to Michele Duran at mlduran@usi.edu)
   Date: 10/1/12

14. Received in Provost Office:
   Date: 10-3-12

15. Notified Chair of University Curriculum Committee:
   Date: 10-3-12

16. Curriculum Committee Meeting date to discuss petition:
   Date: 11-7-12

17. Meeting date published in USI Today:
   Date: 10/29/12

18. Received by Chair of Curriculum Committee:
   Date: __________

   University Curriculum Committee:
   Approved ☐ Not Approved ☐
   Date: __________

   Signature: ____________________________________________
   Chair of Curriculum Committee

19. Sent to Provost:
   Date: __________

20. Received by Provost:
    Date: __________

    Approved ☐ Not Approved ☐
    Date: __________

    Signature: __________________________________________
    Provost

21. Notice of approval by Provost published in USI Today:
    Date: __________

22. Notified Registrar of final approval:
    Date: __________
UNIVERSITY OF SOUTHERN INDIANA  
MATHEMATICS MAJOR  
42 SEMESTER HOURS 

NAME ___________________________________________  ADVISOR ________________

Minor ___________________________________________

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Sem/Yr Cr/Hr</th>
<th>Grade</th>
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<tbody>
<tr>
<td>MATH 230 Calculus I</td>
<td>__________</td>
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<tr>
<td>MATH 253 Principles of Math Logic</td>
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<tr>
<td>MATH 235 Calculus II</td>
<td>__________</td>
<td>4</td>
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<tr>
<td>MATH 335 Calculus III</td>
<td>__________</td>
<td>4</td>
</tr>
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<td>MATH 362 Linear Algebra</td>
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<tr>
<td>MATH 410 Introduction to Analysis</td>
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<tr>
<td>MATH 438 Theory of Probability</td>
<td>__________</td>
<td>3</td>
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<tr>
<td>MATH 412 Abstract Algebra I</td>
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<td></td>
<td>__________</td>
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<tr>
<td></td>
<td></td>
<td>27 Hrs</td>
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</table>

Electives (15 credit hours)

The remaining elective courses are to be selected from upper level course offerings in mathematics as directed by advisor.

| MATH ___________________________ | __________ | ______ |
| MATH ___________________________ | __________ | ______ |
| MATH ___________________________ | __________ | ______ |
| MATH ___________________________ | __________ | ______ |
| MATH ___________________________ | __________ | ______ |
| MATH ___________________________ | __________ | ______ |
|                                   | __________ | ______ |
|                                    | __________ | 15 Hrs |

Total Hours at 300/400 Level

__________ (39) 

Total Hours 42 Hrs _______
### Required Courses

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Sem/Yr</th>
<th>CrHr</th>
<th>Grade</th>
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<td>MATH 230</td>
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<td>Linear Algebra</td>
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<td>MATH 410</td>
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<td>MATH 412</td>
<td>Abstract Algebra I</td>
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<td>MATH 438</td>
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**Total Hours:** 27 Hrs

### Electives (12 credit hours)

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<th>CrHr</th>
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**Total Hours:** 39 Hrs
Question 6—Rationale for Program Modification for the Degree in Mathematics

The rationale for this program modification is to strengthen and enhance the degree in mathematics. This modification includes four items: moving Math 492, History of Mathematics, from a required course to an elective course; moving Math 410, Introduction to Analysis, from an elective course to one of the eight required math courses; removing the requirement that one of the electives be selected from Math 410, Math 432 or Math 433; and increasing the number of elective credit hours from 12 to 15. These proposed changes are the culmination of discussions that began with the implementation of our Assessment Plan in 2008 and continued with our external reviewer and the evaluative committee during our 2010 Program Review. Also factored into our decisions was analysis of data from the 2011 and 2012 Major Field Tests and review of math curricula of our peer institutions.

Math 492, History of Mathematics

Presently, Math 492 serves as the synthesis course for the core curriculum; this will not be a part of the new core curriculum.

Math 410, Introduction to Analysis

Presently Math 410 is a math elective and not a required course. Proposing this course as a required course serves to strengthen the degree. In analyzing data from the Major Field Test, the sub-scores in the areas of calculus, algebra, routine, non-routine, and applied, indicated USI’s weakest performance was in the non-routine and applied areas. Requiring all students earning a degree in mathematics to successfully complete Math 410 is one strategy for addressing this weakness. Secondly, requiring an analysis course better aligns USI’s curriculum with our peer institutions (Indiana State, IU Southeast, Ball State, IUPUI, Western Kentucky, IU South Bend, PPFW, IU Kokomo, Murray State, Purdue and Indiana University) and serves to level the playing field when our graduates compete with graduates from these institutions for seats in graduate programs or for employment opportunities.

Removing the requirement that one elective must be selected from Math 410, Math 432, or Math 433

Requiring Math 410 as one of the required courses nullifies this requirement.

Increasing the Number of Elective Credit-Hours from 12 to 15

The Major Field Test was developed to assess factual knowledge as well as students’ abilities to analyze and solve problems, understand relationships, and interpret material. The Department of Mathematics considers the Major Field Test an important instrument in assessing our program. This exam provides national comparative data on mastery of concepts, principles, and knowledge expected of students completing a degree in mathematics. The goals of the Major Field Test align closely with three of the five program outcomes and tangentially with the other two outcomes of the department assessment plan. Additionally, the Major Field Test will be used in assessing the specialized professional associations (SPA) requirements for all math teaching majors for accreditation through NCATE. For these reasons, the Department of Mathematics could not ignore that USI’s aggregate average score for 2012 was in the 34th percentile. One facet of our plan to address this unacceptable score is to increase the number of elective credit hours required for a major in mathematics.

Increasing the number of elective credit hours from 12 to 15 broadens the experiences of all of our students. Specifically, for our students seeking employment, it increases their opportunities to apply mathematics; for our students entering graduate school, it strengthens their mathematical knowledge; and for our students seeking teacher certification, it increases the breadth of their mathematical knowledge. Increasing the number of credit hours for a degree in mathematics from 39 credit hours to 42 credit hours better aligns USI’s math curriculum with other Indiana colleges and universities where the average number of credit hours for a degree in mathematics is 45. (Indiana University Southeast requires 41 credit hours; Ball State University requires a minimum of 55 credit hours; IUPUI requires 45 credit hours plus a two credit-hour capstone course; IU South Bend requires 45 credit hours; PPFW requires a minimum of 52 credit hours; IU Kokomo requires 41 credit hours; and Indiana State requires 39 credit hours.)

The Department of Mathematics understands the 120 credit-hour constraint for majors; this change does not violate that policy using the present University Core requirements.