

## Indiana Commission for Higher Education

## DISTANCE EDUCATION PROGRAM PROPOSAL

Institution: Indiana University East  
 Degree Program: B.S. in Mathematics (online completion program)  
 Date: October 27, 2011

## Item

1. On-Campus Enrollment/Degree History (from SIS):

The B.S. in Mathematics for on-site delivery was just recently approved and has become available in SIS effective August 2011. At the time of this writing, there is one student enrolled in this program.

For comparison, the enrollment in the related B.A. in Natural Science and Mathematics (Concentration in Mathematics) are listed for both the on-site and the online programs.

## Traditional B.A. in NSM (Concentration in Math only)

	<u>FY2008-09</u>	<u>FY2009-10</u>	<u>FY2010-11</u>	<u>Fall 11</u>
Headcount	3	3	8	8
FTE	3	3	7	6
Degrees	1	3	2	3*
* anticipated				

## Online B.A. in NSM (Concentration in Math only)

	<u>FY2008-09</u>	<u>FY2009-10</u>	<u>FY2010-11</u>	<u>Fall 11</u>
Headcount	0	0	2	16
FTE	0	0	2	10
Degrees	0	0	0	0

2. Mix of Technologies:

This program will be delivered by using the following mix of technologies (select as many as apply):

- Television:  
 One Way Video
- IHETS - Satellite  
 IHETS - Terrestrial  
 IU VIC System
- Cable/Public TV  
 Videocassette  
 Other : (explain here)

Two-Way Video

- IHETS - Satellite
- IHETS - Terrestrial
- IU VIC System

Other : ( explain here )

- Internet/Web
- IHETS INDnet
- IU VIC System
- Other : Oncourse, Indiana University's course management system and publishers' proprietary learning online learning systems (e.g., Pearson's MyLab).

Computer-Based (CD-ROM, DVD, diskette, etc.)

Audioconferencing/Audiocassette

Print Correspondence

Other : ( explain here )

3. Access to the Instruction:

- a. The selected mix of technologies allows students to receive the instruction in the following settings (select as many as apply):

- Home
- Workplace (Including Hospitals)
- Libraries and Other Public, Non-Educational Settings
- K-12 Schools
- Campuses/Centers within the Same System
- All Public Campuses/Centers

- b. Will the institution enroll students in the program from anywhere in the state?

- Yes
- No

( If "No", please explain here )

4. Schedule for Delivering Coursework:

- a. All required coursework in the concentration, with the exception of Calculus I and Calculus II (MATH-M215-M216) will be offered via distance education technology over a 2-year period. The School of Natural Science and Mathematics offers these two courses in an online format, and we intend to admit students into the program without having taken Calculus I and II previously, with the understanding that degree

completion may take an additional year. Please see Appendix A for an outline of the degree completion.

- b. Indiana University East offers a wide variety of online classes that are suitable as general electives.
- c. Please explain how students will be able to complete general education, minor, and other curricular requirements outside of the major.

The 60 hour completion program presumes that students will have met the general education requirements and program requirements of the Indiana University East School of Natural Sciences and Mathematics prior to starting the completion program. However, a student may elect to pursue the program even if this is not the case, and a customized plan of study will be developed for the student to complete initial requirements if not previously completed. If any completion program requirements have already been met through transferable course equivalents, online alternatives may be selected in consultation with the assigned faculty advisor.

5. Off-Campus Curriculum and Instruction:

- a. Will the off-campus curriculum be identical to the on-campus curriculum?

Yes  
 No

- b. Will the program require students to complete laboratory or studio work?

No  
 Yes

( If "Yes", explain here )

- c. Please explain how the program will provide for timely and appropriate interaction between students and faculty members.

Courses will be provided using Oncourse, Indiana University's course management system. Within Oncourse, students and faculty may interact via synchronous or asynchronous forums or by email and chat room. Tele-conference and video conference software (currently provided outside of Oncourse structure) may be used in some courses

- d. Will the program require students to come to campus for any period of time?

- No  
 Yes

If "Yes," please indicate for how long, with what frequency, and for what purpose.

( If "Yes", explain here )

- e. Please explain how the program will provide for timely and appropriate interaction between students and other students.

Courses will be offered in an asynchronous format through Oncourse. Completion of the course will be time limited by the standard semester for on campus offerings.

Students can interact with each other and with the instructor via email, forums, chat rooms, Wiki's, or webcasts.

The School of Natural Sciences and Mathematics maintains an Oncourse site specifically for interaction among students and between students and advisors. This site offers students convenient methods of sending messages to each other, to communicate in online forums and chat.

6. Assessment of Student Learning:

Please explain how student learning will be assessed.

The learning outcomes for the proposed online degree completion program are the same as the outcomes for the traditional B.S. in Mathematics.

Program assessment: The Mathematics faculty has identified several learning outcomes for the proposed B.S. in Mathematics. These include:

- Calculus and its Applications. Students will be familiar with the techniques of integration and differentiation of functions real variables. Students will be able to apply this knowledge to applied problems, such as related rates, maximization, and in determining work, mass, volume and area. Assessment of these learning objectives will be course-based in the Calculus-sequence.
- Abstractions and Proofs: Students will be familiar with basic proof techniques and with fundamental definitions related to the real number system and to the fundamental questions of algebra. Assessment of these learning objectives will be course-based in the three courses Math-M393, M403 and M413.
- Applications: Students will be able to apply standard algorithms in optimization to applied situations. These may include the Simplex Methods for linear programming, constrained non-linear optimization, Branch-and-Bound Algorithms for integer programming, or

applications of Game-Theory. Assessment of this learning objective will be course-based in Math-M447.

- Specializations: Students will have deep knowledge in some areas of specialization within mathematics. This learning objective is achieved by allowing students to choose from a variety of suitable advanced courses. The learning objectives for each course vary, but can be summarized as “gaining knowledge in a field of specialization”. Assessment of this objective will be achieved through course-based assessment and through the senior seminar.
- Cross-knowledge: Students are expected to have knowledge of the types of problems that are being discussed in areas of mathematics other than their area of specialization. As students enter the program they will be advised to begin a portfolio that showcases their understanding of mathematics and its applications. Students will finalize this portfolio during their senior year. Assessment of this objective of cross-knowledge will also be achieved by evaluating the portfolio.

Post-Graduation Assessment: We will evaluate the effectiveness of the program with respect to graduates’ employability through the following measures:

- Graduate Job Placement Rates: Beginning with the first graduates, graduates will be encouraged to provide employment data. An email communication system will help to maintain current employment data.
- Employer Assessments: Employers of the graduates of this program will be requested to provide information regarding their perceptions of the level of preparation of the graduates for their work setting.
- Alumni Surveys: Beginning one year following their graduation, students of the program will be requested to provide feedback regarding the outcomes of their learning as it pertains to their preparation. This survey will be administered one year after graduation and in two-year intervals thereafter.

7. Availability of Academic Support and Student Services:

Please explain how students will have access to each of the following academic support and student services:

- a. Admissions  
The application for admission is online via the IU East home page.
- b. Financial Aid  
Some financial aid forms are available online; financial aid counselors are available by telephone (toll-free).
- c. Academic Advising

Students will be assigned to academic advisors, with whom they can communicate by email or telephone.

- d. **Course Materials (including delivery mechanism)**  
Courses will be provided online using Oncourse, Indiana University's course management system, or through USPS if needed.
- e. **Library Materials (including delivery mechanism)**  
From the IU East library web page students have access to databases (many with full-text articles), interlibrary loan, and electronic reserves. Online LibGuides provide course and subject specific reference assistance. Reference help is available from librarians via a direct email link from the library website.
- f. **Placement and Counseling**  
Placement and Counseling are both available via email and telephone – information about each is provided on the IU East website. A website devoted to Online Learning contains many resources to help students be successful in their courses.
- g. **Technical support (e.g. on-line help desk)**  
Technical support is available (live “tech chat”, email, or phone request) through the IU East Information Technology Help Desk during regular business hours. Requests are forwarded to University Information Technology Services for coverage on evenings and weekends. The Indiana University Knowledge Base provides online printed resources for technology information.

8. Student Fees (current as of Fall 2011):

Fees<sup>1</sup> Charged per Semester Hour  
for Part-Time Students

	<u>Indiana Residents</u>	<u>Non-Residents</u>
On-Campus Instruction (tuition)	\$ 193.94	\$ 546.76
Distance Education Instruction (tuition)	\$ 193.94	\$ 275.07

Mandatory fees:

Distance Education Fee	\$ 30	per course
Student Activity Fees	\$ 5.41	/hr (not to exceed \$64.92 )
Technology Fees	\$ 65.35	(1-5 hours)
	100.30	(6-11 hours)
	136.30	(12 or more hours)

9. Review Process:

This program will be reviewed under the process and criteria dated ( enter date ), which has been transmitted to the Commission for Higher Education.

<sup>1</sup> All tuition and mandatory fees

This program will be reviewed under the existing process for review of programs in the School of Natural Science and Mathematics. External reviews take place on a 5-year cycle. The next review will be Spring 2012.

**NEW ACADEMIC DEGREE PROGRAM PROPOSAL SUMMARY**

I. Prepared by Institution

Institution/Location: Indiana University East Richmond, IN  
 Program: B.S. in Mathematics (online completion program)

	<u>Year 1</u> <u>FY2012-13</u>	<u>Year 2</u> <u>FY2013-14</u>	<u>Year 3</u> <u>FY2014-15</u>	<u>Year 4</u> <u>FY2015-16</u>	<u>Year 5</u> <u>FY2016-17</u>
Enrollment Projections (Headcount)					
Full-Time	<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>	<u>40</u>
Part-Time	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>	<u>40</u>
Enrollment Projections (FTE)					
Full-Time	<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>	<u>40</u>
Part-Time	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>	<u>40</u>
Degree Completions Projection	<u>0</u>	<u>0</u>	<u>10</u>	<u>10</u>	<u>10</u>
New State Funds Requested (Actual)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
New State Funds Requested (Increases)	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

II. Prepared by CHE

New State Funds To Be Considered  
for Recommendation (Actual)

New State Funds To Be Considered  
for Recommendation (Increases)

CHE Code:  
Campus Code:  
County Code:  
Degree Level:  
CIP Code:

Comment: Budget calculations are based on the assumption that Year 1 = FY2012-13

**Appendix A:**

Outline for degree completion for students entering in the Fall Semester of an odd year

First Year Fall	First Year Spring	First Year Summer	Second Year Fall	Second Year Spring	Second Year Summer
<b>MATH-M311*</b> (Calculus III)	<b>MATH-M313 §</b> (Differential Eqns)	Elective	<b>MATH-M366 §</b> (Statistics)	<b>MATH-M303*</b> (Linear Algebra)	Elective
<b>MATH-M371 §</b> (Numerical Method)	<b>MATH-M393 *</b> (Bridge to Abstract Math)	Elective	<b>MATH-M413*</b> (Real Analysis)	<b>MATH-M403*</b> (Modern Algebra)	Elective
<b>MATH-M380 §</b> (History of Math)	<b>INFO-I201§</b> (Math Fndts Inform.)		Elective	<b>MATH-M499*</b> (Senior Seminar)	
<b>MATH-M447*</b> (Math Models)	Elective		Elective	Elective	
12	13	6	12	11	6

Course in **bold** font are courses within the major.

Courses marked with \* are required courses in the major.

Courses marked with § are electives within the major and may be substituted with other suitable courses, as outlined in the Math B.S. program description.

Electives may be any additional courses. Students who complete the courses in the major as described in this plan will meet IU East residency requirements and course-level requirements as prescribed by Institutional Program requirements.