Indiana University East

Graduate Certificate in Mathematics

In an email from Markus Pomper to Dr. Sherry Queener:

I met with Jeff Watt and have revised the Graduate Certificate, following his recommendations. The revised proposal is attached. I am also including a rationale for the changes to the degree proposal.

The use of classes below the 500-level appears to be the major concern of the Graduate Committee. The revised program still uses some 400-level courses. However, this is in strict keeping with the Graduate School's policies on graduate courses, and has precedent through IU Bloomington's Master of Arts in Teaching and M.A. in Mathematics. The attached rationale contains links to all relevant materials. I also included an explanation as to why the program is not a replication of an undergraduate degree.

I have also made some changes in the assessment plan and in the rationale for the program.

Indiana University
Request for a New Credit Certificate Program

Campus: Indiana University East

Proposed Title of Certificate Program: Graduate Certificate in Mathematics

Projected Date of Implementation: Fall 2014

TYPE OF CERTIFICATE: (check one)

☐ UNDERGRADUATE CERTIFICATES – These programs generally require 12-29 credits of undergraduate-level academic work.

☑ GRADUATE CERTIFICATES – These programs generally require 12-29 credits of graduate-level academic work or undergraduate academic work carrying graduate credit.

☐ POST-BACCALAUREATE CERTIFICATES –These programs generally require 12-29 credits of undergraduate-level academic work, although students enrolling in these programs must have completed their baccalaureate degrees.

I. Why is this certificate needed? (Rationale)

The proposed program, a Graduate Certificate in Mathematics, is a program consisting of 18 credit hours of graduate credit in Mathematics. This qualification may supplement an existing Master's degree (e.g., in Education or Teaching) and provide the necessary credentials for teaching introductory level courses at the community college.[1] The program may also be of interest for current in-service High School teachers who wish to teach dual credit or AP courses in Mathematics. For this population, an existing teaching certification in conjunction with the proposed Graduate Certificate provides the necessary qualification to teach dual-credit classes[2]. In addition, the proposed certificate may serve some holders of a baccalaureate degree in mathematics who wish to go to graduate school but lack some of the admissions requirements.

Considering the Commission for Higher Education's *Reaching Higher* document and their associated goals, there is no shortage of demand for community college faculty with the credentials to teach basic mathematics courses. For example, the Commission's *Reaching Higher*[3]document calls for:

- An increase of the number of Academic Honors Core 40 diplomas to 50% of the graduating class by 2015 (from 32% in 2008-09 and 30.1% in 2003-04).

- A reduction of the amount of remedial instruction offered by IU and Purdue's regional campuses to no more than 10% of their credit hours.
- An increase in the number of dual-credit or AP courses offered and taken at Indiana high schools.
- An increase in the number of degrees conferred by Ivy Tech Community College and Vincennes University to 12,140 by 2015 (from 8,589 in 2009 and 8,093 in 2005) and
- An increase in Indiana's adult college participation rate to rank 10th in the nation by 2015 (from 27th in 2009-10).

The proposed Graduate Certificate is designed to meet these objectives by preparing the workforce that is capable of delivering on this promise. A graduate from this program will be qualified to teach at the community college level, as well as broaden his or her qualifications at the high school level to include dual credit courses.

The benefit of the proposed program to high schools in Indiana University East's service area cannot be overstated. The increased availability of dual-credit and AP courses at Indiana high schools is one of the goals stated in the Commission's *Reaching Higher* document. In her testimony to the Subcommittee on Higher Education and Workforce Training in July 2012[4], Commissioner Lubbers reiterated this goal. Access to these programs increases the academic rigor of high school education, and provides students with a cost-effective way of getting a head start on their college program. Participation in AP and dual credit (ACP) programs has been shown to increase students' college participation and graduation rates. The proposed program will provide high school teachers with the necessary credentials for teaching AP and ACP courses. Indeed, one of Indiana University's requirements for ACP teachers is "a Master's degree or its equivalent in graduate hours or significant graduate courses to reflect knowledge and depth in the subject area approved for"[5]. In addition to this general requirement, Indiana University expects teachers who wish to teach Calculus to have taken a course in Real Analysis; and teachers who wish to teach Finite Mathematics to have taken a course in probability theory. A graduate from the proposed program clearly would meet these qualifications.

Indiana Public Law requires all public high schools to offer at least two dual credit course choices to their students. Among all possible choices of dual credit courses, Calculus I is designated by the Commission as a Priority Dual Credit Course[6]. Yet, in 2010-11 only 34 high schools statewide offered Calculus I as an ACP course, serving 281 students. In the Indiana portion of IU East's service area, only 5 high schools offer ACP Calculus, providing dual credit to 27 students[7]. In summary, only a small proportion of Indiana's secondary schools currently provide the opportunity for ACP Calculus courses. The proposed program would provide area teachers with the credentials to offer this course. We anticipate that high school teachers with the additional Graduate Certificate would also provide guidance to the high schools in preparing more students and motivating them to attempt the dual credit courses in mathematics.

The Commissions' ambitious goals regarding enrollment at and graduation from the community college indicate that there will be a recurring demand for qualified individuals to teach remedial and entry-level mathematics at the community colleges.

The Commission's plan calls for an increase by 3,500 in the number of Associate degrees conferred annually. Assuming that each student takes two mathematics classes to attain his or her degree, and assuming Ivy Tech Community College's average class size of 22[8], we arrive at a need to staff an additional 318 sections of mathematics classes at the community college level statewide each year.

Currently Indiana's percentage of adults without a college degree who are in the process of pursuing their first degree is 5.6%, compared with the national average of 6.4%. This ranks the state 27th in the nation. In order to meet the goal of reaching a rank of 10th, Indiana needs to increase the proportion of adults in college by 30% (from 5.6% to 7.3%, in order to compete with Maryland for 10th place). Reflecting the fact that re-entering adult students have a high need for remedial mathematics, we use estimate that each such student will take three mathematics courses before earning an associate degree, and that such degree is completed in three years. Consequently, each such student takes, on average, one mathematics class per year. In 2010, Ivy Tech Community College enrolled approximately 60,000 students over age 25[9]. An increase of 30% in enrollment of the adult student population at Ivy Tech Community College, a need of one class per year, and an average class size of 22 translate into a statewide need of approximately 800 mathematics classes that need to be staffed each year.

While these numbers reflect statewide needs, the situation in IU East's service area is even more dire[10]. The percentage of adults with no high school degree in this area is 16%, compared with 13% statewide. The percentage of adults in the region with a high school diploma, but no college degree is 63%, compared with 56% statewide. The poor educational attainment in IU East's service region suggests it is necessary to prime the educational pump and increase the number of qualified teachers at the high school and community college level.

Lastly, Indiana University East's Mathematics Department itself would benefit from this program, since our enrollment growth of the previous years has led to a recurring demand for qualified adjunct teachers. The total number of credit hours taught at the 100-level in the Mathematics Department at IU East has grown by 900% from AY2004-05 to AY2011-12. The number of credit hours taught by adjuncts has grown at a similar rate. While some of this additional demand was absorbed by excess capacity in existing sections, it has not always been easy to find qualified adjunct teachers in order to staff additional sections. The Department of Mathematics anticipates that the problem will be further compounded in the near future, as many of the long-time adjunct faculty are well beyond retirement age. In order to maintain its educational mission, Indiana University East must do its share to prepare the workforce that is capable of teaching basic college level mathematics courses.

In a recent press release, Commissioner Lubbers stated[11]: "It is not an overstatement to say that Indiana's future depends on the education level of our citizens. Increasing college completion is our passport to opportunity and prosperity, and we must embrace this challenge with a sense of urgency and shared responsibility." The state's ambitious goals of increasing the number of graduates at the community college level, the number of academic honors diplomas, the number of dual credit classes, and the number of adult participants in higher education necessitates a significant increase in the number of qualified Mathematics teachers.

In preparation for this and for another graduate program, the School of Natural Sciences and Mathematics has obtained survey data from 31 of the 41 area high schools in Indiana alone. (High schools in the two Ohio counties of our service area were not included, nor were high schools in adjacent counties in Northern Kentucky or Indiana, even though the program and the location of the on-campus offerings might be attractive to some residents of these counties). This survey represents 131 mathematics teachers. There are approximately 170 mathematics teachers in our service area. Based on this survey, we anticipate that annually 4-6 mathematics teachers will choose to pursue this certificate at the behest of school administrators. (This is in addition to the same number of teachers who are expected to pursue a M.A.T. degree, if Indiana University East obtains permission to offer this degree).

In summary, there is a significant need for faculty who are qualified to teach introductory college level courses, dual credit courses, and AP courses. This need affects all areas of the state, but is particularly pronounced in rural areas. The intended audience for the proposed Graduate Certificate consists of current in-service teachers who seek to obtain the credentials for teaching at the community college. It may prove burdensome for many prospective degree candidates to travel to Richmond in order to attend evening or weekend classes. Because the shortage of qualified teachers is statewide, we propose to offer this Graduate Certificate initially an all-online format. If there is sufficient local demand, we intend to intend to offer the program also as a traditional classroom based program.

II. List the major topics and curriculum of the certificate.

The Certificate consists of 18 credit hours in mathematics at the graduate level.

For the purpose of this program, a graduate course is any MATH-M course at the 400-level or above. An exception is made for MATH-M393, as stated below.

Students are required to take 18 credit hours from courses in these areas within mathematics, at least one course from each group. This selection may not repeat courses that were taken as part of the student's undergraduate program:

i. Analysis (e.g., MATH-M413, M414, M415, M511, M512, M513, M514)

ii. Algebra (e.g., MATH-M403, M404, M501)
iii. Topology/Geometry (e.g., MATH-M421, M521, M522)
iv. Applications (e.g., MATH-M447, M448)
v. Probability/Statistics (e.g., MATH-M463, M466).

Students who have not taken MATH-M393 (Bridge to Abstract Mathematics), or equivalent, during their undergraduate career will be required to take this course.

These courses are designated dual undergraduate/graduate courses, as noted in the IU Graduate School Bulletin[12].

In select circumstances, the Chair of the Department of Mathematics may approve deviations from this program. This may occur in cases where a student's specific career interests warrant in-depth study of one area at the expense of the breadth prescribed in the curriculum noted above.

All courses for this program are currently offered in an online format, which allows students to complete this program online.

III. What are the admission requirements?

- Completion of a baccalaureate degree in Mathematics or related discipline, to include courses in the Calculus Sequence and Linear Algebra;
- Undergraduate GPA of at least 3.0 (on a 4.0 scale);
- Completed application;
- Official transcripts submitted to IU East;
- Curriculum Vita and a brief personal statement that explains the applicant's career goals.

IV. List the major student outcomes (or set of performance based standards) for the proposed certificate.

Instructional objectives

- To provide students with the rigorous understanding of key areas in mathematics, including formal definitions and formal proofs;
- Develop heuristics for judging a statement as true or false, and providing a proof or counterexample as indicated.
- To provide students with an understanding of the applications of mathematics, standard methods for solving applied problems, and/or applications in probability or statistics;
- To lay the foundation for further study of mathematics, possibly through independent

reading.

Performance-based standards

- Students will be able to provide formal definitions and proofs for select theorems in abstract algebra, real or complex analysis, and topology;
- Students will be able to conjecture the validity of proposed statements and will be able to substantiate their answer using proof methods in establishing the statement, or will draw from an array of examples in finding a counterexample;
- Students will be able to formulate select applied problems as a mathematical problem, and choose a suitable solution method to solve these problems, and interpret the result in the context of the given problem.

V. Explain how student learning outcomes will be assessed (student portfolios, graduate follow up, employer survey, standardized test, etc.) and describe the structure/process for reviewing assessment findings for the purpose of ensuring continuous improvement of the certificate.

To complete their studies, students will assemble a portfolio. This portfolio will contain a summary of each course the student has taken and will include artifacts that illustrate some of the student's work. The collection of these portfolios will serve as the basis for assessment.

As part of each course summary, the student will provide a reflection on the key concepts that were studied in the course. The student will select the artifacts, in consultation with the advisor, in order to illustrate the development of the course material, and any connections to other areas within mathematics. Further, students will be asked to select an advanced topic in mathematics (that has not been covered in the student's coursework) and independently summarize important aspects of this topic. Depending on the student's interests, this may be a research article.

Portfolios will be evaluated on the completeness of the exposition of each course subject, on the ability to detect and explain connections to other areas of mathematics, and on their ability to independently study material beyond the scope of their coursework.

The Chair of the Department of Mathematics will supervise the assessment process. Initial quantitative measures to evaluate the success of the program will be the number of students enrolled the proposed certificate program, and the number of students who complete the program and their G.P.A. The overall goals for the Graduate Certificate in Mathematics, course goals and objectives will be in place and will be assessed in accordance with the Mathematics Department Assessment Plan. A full program review will be completed every five years, as part of the School's cycle of outside review. The decisions of this review will be informed by the collective of evaluation benchmarks described below.

Evaluation Benchmarks for Student Success

A. Acceptance into the Program and Entrance Survey
   Candidates submit application materials (as outlined above). These materials are used to determine whether the applicant is ready for graduate study, and help identify the need for remediation.
   The collection of these materials, together with data collected in later benchmarks, will help the School of Natural Sciences evaluate and adapt the admissions standards for the program.

B. Completion of Mathematics. Depending on the type of course taken, assessment will address the following area:

   a. Proof and Rigor in Mathematics
      This assessment will be course embedded. In appropriate courses (Analysis, Algebra, Topology), instructors will assess students' ability to understand and apply rigorous definitions, provide suitable examples and counterexamples, and give rigorous proofs of theorems. In these courses, the assessment will also investigate students' ability to judge truth of statements, and to provide a proof or a counterexample, as needed.
   b. Mathematical Modeling and Applications
      This assessment will be course embedded. In appropriate courses (Probability, Statistics, Mathematical Modeling), instructors will assess students' ability to apply the concepts in real-world situations, select suitable solution methods and interpret the answer in the context of the given problem.
   c. The assessment strategies for these learning objectives have already been established for courses in the undergraduate programs in Mathematics. Courses used in the proposed program will be assessed using the same strategies. The School will use the benchmarks to determine whether a student is in good standing and, if needed, will suspend students who do not meet these criteria. The school will also use the course assessment to make improvements to individual courses.

C. Exit Survey
   An interview will be conducted with all graduate students upon completion of the program. Questions will be designed to evaluate outcomes of student learning along with resources, program content, program administration, and faculty. As part of the exit interview we will administer the same survey for the students' disposition towards proof and rigor in mathematics as was given upon admission. The progression in attitude towards the principle tenets of mathematics will inform the Department's decisions on course design, and possible changes in the program. The exit survey will also determine whether graduates are likely to accept part-time employment at a

community college, or gain acceptance to graduate school.

VI. Describe student population to be served.

The proposed program will attract and serve current high school mathematics teachers who wish to expand their teaching to include dual credit courses and/or courses at the community college.

We also anticipate that a small number of students will enroll in this program as a preparation for graduate studies in Mathematics.

VII. How does this certificate complement the campus or departmental mission?

The proposed certificate program is compatible with the Mission, Vision and Initiatives of Indiana University East, as endorsed by the Faculty Senate. Two Faculty Senate Resolutions, passed May 2004 and November 2009, endorse graduate education as an appropriate component of the mission of Indiana University East. Indiana University East has the mission of offering bachelor's degrees and selected master's degrees.

The mission statement of Indiana University East is as follows: "Indiana University East, a regional campus of Indiana University, offers residents of eastern Indiana, western Ohio and beyond a broad range of bachelor's degrees and selected master's degrees and certificates through its traditional main campus in Richmond, off-campus sites, and online program options."

The Commission for Higher Education's Policy on Regional Campus Roles and Mission (March 11, 2010) notes that regional campuses "may offer selected masters programs to meet state and regional needs". It has been established earlier, that the region has a continuing need for qualified mathematics teachers to teach introductory courses at the community college, and to teach dual credit courses at the high schools.

VIII. Describe any relationship to existing programs on the campus or within the university.

The School of Natural Sciences and Mathematics has the capacity to offer a large portion of the mathematics courses for this program in conjunction with existing mathematics programs. The majority of the courses required for the program may be taken either for undergraduate or graduate credit. As such, many of the courses needed for the certificate program would do double-duty and sustain both the undergraduate and the graduate certificate programs.

Indiana University East currently offers an online degree completion program for a B.S. in Mathematics, and a B.A. in Natural Sciences and Mathematics. The Department therefore has

significant expertise in creating coherent online programs, and in preparing mathematics courses for online delivery. We regularly offer five classes at the 400-level (M403, M405, M413, M421, and M447), and intend to increase this offering to eight courses within the next two years (by adding M404, M414, M448). At that time, we will be able to offer the requisite coursework for the proposed Graduate Certificate, albeit with a minimal selection of courses from which the student may choose electives. The Department of Mathematics at IU East will collaborate with other IU Math Departments, who may provide additional elective courses for this certificate.

In addition, Indiana University East is also in the process of proposing an M.A.T. in Mathematics. This program has an 18 hour core that is almost identical to the proposed Graduate Certificate. If this program is approved, the required courses for the graduate certificate would also sustain the M.A.T. program.

Furthermore, a student may choose to complete the coursework for the proposed Graduate Certificate first, and then apply for admission to the M.A.T. in Mathematics. In such a case, we intend to apply the applicable graduate courses from the Graduate Certificate to the M.A.T., which means that any student seeking teacher licensure would need to complete the School of Education's Transition to Teaching program (18 credit hours), and possibly a small number of additional math classes, in order to meet the remaining degree requirements for the M.A.T.

IX. List and indicate the resources required to implement the proposed program. Indicate sources (e.g., reallocations or any new resources such as personnel, library holdings, equipment, etc.).

The library has adequate resources for this degree. The current physical and information infrastructure is sufficient to support the program. No new positions are needed to implement the Graduate Certificate at this time. The majority of the courses needed for the program are already offered as part of the B.S. in Mathematics, and the few additional courses may be scheduled at current staffing levels. As enrollment grows, additional faculty resources may be needed to complement existing tenure and lecturer lines.

Indiana University East Administrators

Kathryn Cruz-Uribe, Ph.D., Chancellor, Indiana University East
Laurence Richards, Ph.D., Executive Vice Chancellor for Academic Affairs
Mary Blakefield, Ph.D., Associate Vice Chancellor for Academic Support Programs
Ross Alexander, Ph.D., Associate Vice Chancellor for Academic Affairs and Dean of Graduate Studies
Trudi Weyerman, D.A., Interim Associate Vice Chancellor for Teaching and Learning and Acting Dean of Distance Education
Neil Sabine, Ph.D., Dean, Natural Sciences and Mathematics
Markus Pomper, Ph.D., Chair, Department of Mathematics

Indiana University East Mathematics Faculty

Doctorally Qualified Faculty in Mathematics and Teaching Specialties

Morteza Seddighin, Ph.D., Professor of Mathematics.
Real Analysis, Functional Analysis, Optimization in Hilbert Spaces
Markus Pomper, Ph.D., Associate Professor of Mathematics.
Real Analysis, Geometry of Banach Spaces.
Young You, Ph.D., Assistant Professor of Mathematics.
Complex Analysis, Applied Mathematics.
Julia Kim, c.Ed.D., Visiting Assistant Professor of Mathematics.
Mathematics Education

The Department intends to hire two additional tenure-track faculty members with specializations in Algebra and Probability Theory in August 2014.

M.S./M.A.T-degree prepared Mathematics faculty members at Indiana University East will be available to teach some courses in their areas of expertise on a limited basis.

X. Describe any innovative features of the program (e.g., involvement with local or regional agencies, or offices, cooperative efforts with other institutions, etc.).

None noted.

References

[1] The typical position description requires a "Master's degree with 18 credit hours in Mathematics".
[2] Indiana University's ACP program requires "a significant" number of credits in Math in order to teach dual credit courses; Ivy Tech Southeast communicated that 12 graduate credit hours in Mathematics are sufficient for this purpose.
[3] Indiana Commission for Higher Education: Reaching Higher – State Level Dashboard of Key Indicators, February 2010. http://www.in.gov/che/files/Final_2010_Update(3).pdf
Accessed on July 17, 2012
[4] http://edworkforce.house.gov/UploadedFiles/07.18.12_lubbers.pdf
Accessed on July 30, 2012
[5] The full qualifications for the ACT program teachers may be found at
http://acp.indiana.edu/index.php?nodeID=teacherAcceptanceStandards-generic
Accessed on July 31, 2012
[6] http://www.doe.in.gov/sites/default/files/individualized-learning/priority-dual-credit-coursesidoe.pdf
[7] Data provided by Indiana University's ACP coordinator
[8] Ivy Tech Community College's Average Class size is stated on Ivy Tech Community College's website "About Us". http://www.ivytech.edu/about/
Accessed on July 20, 2012
[9] Ivy Tech Community College of Indiana. Institutional Research, Student Profiles.
http://www.ivytech.edu/institutional-research/profiles/2010.pdf
Accessed on July 20, 2012
[10] Obtained from STATS Indiana, http://www.stats.indiana.edu/index.asp
[11] Press release of Commission for Higher Education.
http://www.in.gov/che/files/121001RELEASE_-_Commissioner_on_Community_Tour-UPDATED.pdf
Accessed on October 8, 2012
[12] http://www.indiana.edu/~bulletin/iu/grad/2008-2009/Mathematics0809.pdf

VINCENNES UNIVERSITY
www.vinu.edu

Vincennes University
Vincennes, Indiana 47591
(812) 888-8888
Fax (812) 888-5868

www.vinu.edu

September 13, 2013

Dear Commissioners,

I am writing a letter of support for a new Graduate Certificate Program that is being proposed by Indiana University East. This new program, consisting of 18 credit hours of graduate credit in mathematics, offers a good solution to meet the need for qualified math instructors in our state.

The proposal outlines the various target audiences and demands for math instruction to meet the goals for a qualified workforce in Indiana. As an educator at Vincennes University, I am well aware of the challenges to attract and hire individuals with minimum credentials in math. Just as rural secondary schools are challenged to find faculty who qualify to teach dual credit math courses, department chairs at the community college level scramble every year to find qualified adjuncts for math instruction. This proposal offers a concrete solution for broadening a narrow candidate pool. As an online program, it is also appealing to secondary math educators who are already in Indiana and, very likely, in many of rural areas where we have a documented need.

The faculty at IU-East is to be commended for identifying the need and preparing a practical solution to certify college-level math instructors with the proposed program. I urge you to approve this Graduate Certificate Program.

Yours truly,

Laurel Smith, Ph.D.

Interim Assistant Provost for Curriculum and Instruction
Vincennes University
1002 N. First Street
Vincennes, IN 47591
812.888.4176
lasmith@vinu.edu

IVY TECH COMMUNITY COLLEGE

August 8, 2013

Dr. Laurence D. Richards
Executive Vice Chancellor
Indiana University East
2325 Chester Blvd
Richmond, IN 47374

Dear Dr. Richards:

I am writing in support of Indiana University East's proposed Graduate Certificate in Mathematics. I am the Vice Chancellor for Academic Affairs at Ivy Tech Community College of Indiana - -Southeast, with campuses located at Batesville, Lawrenceburg, and Madison. As you know, the Southeast corner of the state has no public university, so our staff and faculty have limited opportunities to become credentialed to teach in certain areas. Mathematics is one of those areas.

On the Madison campus, we have two full-time employees who have expressed to me their desire to earn their credential to teach college-level mathematics. Unfortunately they currently cannot do so as they need to maintain their full-time employment with us, so attending a day-time class in Louisville or Cincinnati is out of the question. I have helped them search for an on-line answer, but there is none, until now. We also have several adjuncts instructors who would like to earn their credentials. So the Southeast Region would very much like to have this Certification Program in Mathematics as an option for our full-time and part-time instructors.

Additionally, this Certification Program in Mathematics will attract high school instructors who desire to teach dual credit mathematics for Ivy Tech or become an adjunct instructor for us. That would create more opportunities for our high school students to earn dual credit and make a smoother transition into college or university curriculum, increasing the probability that students will be successful in college.

This program will be a wonderful opportunity for the Southeast corner of the state.

Sincerely

Joe Moore

L. Joe Moore, Ph.D.
Vice Chancellor for Academic Affairs
Ivy Tech Community College of Indiana - -Southeast
Madison, IN 47250

590 IVY TECH DRIVE
MADISON, INDIANA 47250-1881
812-265-2580
FAX: 812-265-4028

IVY TECH COMMUNITY COLLEGE

September 11, 2013

Dr. Markus Pomper
Associate Professor of Mathematics
Chair, Department of Mathematics
Indiana University East
Richmond, IN 47374

Dear Dr. Pomper:

Ivy Tech Community College enthusiastically supports your proposal to offer a new Graduate Certificate in Mathematics as part of the proposed MAT in mathematics.

Ivy Tech's credentialing requirements for teaching program level mathematics requires instructors to possess a master's or higher degree from a regionally accredited institution with at least 18 graduate credit hours in mathematics-related courses. Your degree will meet these requirements and help us fill a growing need for qualified adjunct instructors, along with potential full-time faculty positions in mathematics. Our regional Vice-Chancellors for Academic Affairs consistently rank mathematics as one of the two most challenging areas for meeting our faculty needs.

Furthermore, your plan to offer the Graduate Certificate through an all-online format is ideal for Ivy Tech. This means we can make this opportunity available to potential instructors across the state at each of our 14 regions.

Thank you for your leadership in putting together this program. Again, on behalf of Ivy Tech Community College, we endorse the proposal wholeheartedly.

Sincerely,

Russell D. Baker, Ed. D.
Vice President of Academic Affairs
Ivy Tech Community College

c: Dr. Mary Ostrye, Provost
c: Dr. Ken Sauer, Senior Associate Commission for Academic Affairs, CHE

50 WEST FALL CREEK PARKWAY NORTH DRIVE
INDIANAPOLIS, INDIANA 46208-5752
P. 317-921-4882

INDIANA UNIVERSITY
NORTHWEST

To Whom It May Concern

Dear Colleagues:

As chairperson of the Department of Mathematics and Actuarial Science at Indiana University Northwest, I am extremely interested in the ongoing projects and expanded degree and certificate offerings of online coursework at Indiana University East. The proposed Master Degree program as well as the proposed Certificate program will be a great addition to the lineup of upper-level mathematics classes at Indiana University. Often we have seniors who neglected to take courses in correct sequence and need a particular course for their major in mathematics. At that point we are faced with an unfortunate dilemma: (1) ask the student to postpone graduation and take the class when it is offered again, or (2) offer the course in an independent study mode (which is hard on instructor and robs the student of a full-featured class experience). Having an option to take these classes online at IU East will be a great benefit to our students as well. At the same time – students at other IU regional campuses (like IU Northwest) can enroll and complete this certificate and Master program by combining their locally offered courses with the online offering at IU East even after they graduate.

Therefore, I full heartedly support both of the proposed programs at IU East. I believe they will prove to be of great benefit to students within the Indiana University system as well as contribute to the increased completion and graduation rates at all Indiana University campuses (and possibly other state colleges in Indiana).

Sincerely,

Dr. Iztok Hozo, Chairperson
Professor of Mathematics
Department of Mathematics and Actuarial Science
Indiana University Northwest