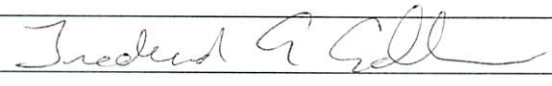
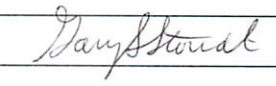
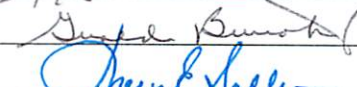
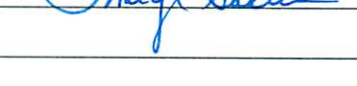
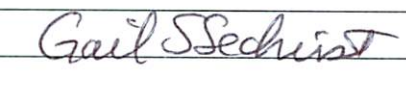


LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:	Senate Action Date:
		06-476	App 4/3/07	Info. 5/1/07

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person Gary Stoudt	Email Address gsstoudt@iup.edu
Proposing Department/Unit Mathematics	Phone 7-2608

Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

1. Course Proposals (check all that apply) ☐ New Course ☐ Course Prefix Change ☐ Course Deletion ☒ Course Revision ☐ Course Number and/or Title Change ☐ Catalog Description Change		
VARIOUS		
<u>Current Course prefix, number and full title</u>		<u>Proposed course prefix, number and full title, if changing</u>
2. Additional Course Designations: check if appropriate ☐ This course is also proposed as a Liberal Studies Course. ☐ Other: (e.g., Women's Studies, Pan-African) ☐ This course is also proposed as an Honors College Course.		
3. Program Proposals ☐ New Degree Program ☐ Program Title Change ☐ Program Revision ☐ New Minor Program ☐ New Track ☐ Other		
<u>Current program name</u>		<u>Proposed program name, if changing</u>
4. Approvals		
Department Curriculum Committee Chair(s)		Date 2/2/2007
Department Chair(s)		2-2-07
College Curriculum Committee Chair		03/12/07
College Dean		3/12/07
Director of Liberal Studies *		3-29-07
Director of Honors College *		
Provost *		
Additional signatures as appropriate: (include title)		
UWUCC Co-Chairs		4-3-07

* where applicable

Received

MAR 14 2007

Liberal Studies

II. Description of Curriculum Change

Current Catalog Description	Proposed Catalog Description
MATH 219 Discrete Mathematics 3c-0l-3cr Prerequisite: COSC 110 and MATH 122 or 123 Topics include set algebra, mappings, relations, semigroups, groups, directed and undirected graphs, Boolean algebra, and propositional logic, with examples and applications of these to various areas of computer science. Emphasizes developing an intuitive understanding of basic structures rather than formal theories and influence of these topics on theory and practice of computing.	MATH 219 Discrete Mathematics 3c-0l-3cr Prerequisite: COSC 110 and MATH 122 or 125 Topics include set algebra, mappings, relations, semigroups, groups, directed and undirected graphs, Boolean algebra, and propositional logic, with examples and applications of these to various areas of computer science. Emphasizes developing an intuitive understanding of basic structures rather than formal theories and influence of these topics on theory and practice of computing.
MATH 241 Differential Equations 3c-0l-3cr Prerequisites: MATH 122 or 124 Emphasizes techniques of solution and applications of differential equations. Topics include first order equations, second order linear equations, systems of linear equations, and series solutions of differential equations.	MATH 241 Differential Equations 3c-0l-3cr Prerequisites: MATH 122 or 126 Emphasizes techniques of solution and applications of differential equations. Topics include first order equations, second order linear equations, systems of linear equations, and series solutions of differential equations.
MATH 271 Introduction to Mathematical Proofs I 3c-0l-3cr Prerequisites: MATH 123 and 171 Gives basic ideas necessary to prove results in mathematics. Includes but is not limited to logic of mathematics, basic methods of proof, algebra of sets, equivalence relations and partitions of sets, functions, and mathematical induction.	MATH 271 Introduction to Mathematical Proofs I 3c-0l-3cr Prerequisites: MATH 121 or 125; 171 Gives basic ideas necessary to prove results in mathematics. Includes but is not limited to logic of mathematics, basic methods of proof, algebra of sets, equivalence relations and partitions of sets, functions, and mathematical induction.
MATH 272 Introduction to Mathematical Proofs II 3c-0l-3cr Prerequisites: MATH 124 and 271 with a grade of C or better A further study of the basic ideas of contemporary mathematics. Topics include but are not limited to mathematical induction, cardinality of sets, relations, methods of proof in number theory, analysis, and algebra.	MATH 272 Introduction to Mathematical Proofs II 3c-0l-3cr Prerequisites: MATH 126 and 271 with a grade of C or better A further study of the basic ideas of contemporary mathematics. Topics include but are not limited to mathematical induction, cardinality of sets, relations, methods of proof in number theory, analysis, and algebra.
MATH 342 Advanced Mathematics for Applications 4c-0l-4cr Prerequisite: MATH 241 Deals with the application of mathematics to problems of science. Emphasizes the three phases of such an application and the development of skills necessary to carry out each step: 1) translation of the given physical information to a mathematical model; 2) treatment of the model by mathematical methods; 3) interpretation of the mathematical result in physical terms. Topics include vector calculus, integral theorems, Fourier series, partial differential equations, and the Laplace transformation.	MATH 342 Advanced Mathematics for Applications 4c-0l-4cr Prerequisite: MATH 122 or 225; 241 Deals with the application of mathematics to problems of science. Emphasizes the three phases of such an application and the development of skills necessary to carry out each step: 1) translation of the given physical information to a mathematical model; 2) treatment of the model by mathematical methods; 3) interpretation of the mathematical result in physical terms. Topics include vector calculus, integral theorems, Fourier series, partial differential equations, and the Laplace transformation.
MATH 350 History of Mathematics 3c-0l-3cr Prerequisite: MATH 122 or 124 or instructor permission Development of the central concepts of mathematics from ancient times up to the development of calculus in the seventeenth century. Mathematical concepts are placed in historical perspective. The use of the history of mathematics as a pedagogical tool and its relationship to other sciences will be addressed.	MATH 350 History of Mathematics 3c-0l-3cr Prerequisite: MATH 122 or 126 or instructor permission Development of the central concepts of mathematics from ancient times up to the development of calculus in the seventeenth century. Mathematical concepts are placed in historical perspective. The use of the history of mathematics as a pedagogical tool and its relationship to other sciences will be addressed.

MATH 363 Mathematical Statistics I 3c-0l-3cr Prerequisites: MATH 122 or 124; 216 Probability theory necessary for an understanding of mathematical statistics is developed. Applications of set theory to models, combinations and permutations, binomial, Poisson and normal distributions, expected values, and moment generating functions.	MATH 363 Mathematical Statistics I 3c-0l-3cr Prerequisite: MATH 216; MATH 225 (may be taken concurrently) Probability theory necessary for an understanding of mathematical statistics is developed. Applications of set theory to models, combinations and permutations, binomial, Poisson and normal distributions, expected values, and moment generating functions.
MATH 421 Advanced Calculus I 3c-0l-3cr Prerequisites: MATH 124 and 272 with a grade of C or better A study of set theory, real number system, functions, topology of Cartesian space, sequences, convergence and uniform convergence, continuity, and uniform continuity.	MATH 421 Advanced Calculus I 3c-0l-3cr Prerequisites: MATH 272 with a grade of C or better A study of set theory, real number system, functions, topology of Cartesian space, sequences, convergence and uniform convergence, continuity, and uniform continuity.
MATH 423 Complex Variables 3c-0l-3cr Prerequisite: MATH 124 An introduction to the theory of functions of a complex variable: topics included are elementary functions, analytic functions, conformal mapping, integration, series, and application.	MATH 423 Complex Variables 3c-0l-3cr Prerequisite: MATH 225 An introduction to the theory of functions of a complex variable: topics included are elementary functions, analytic functions, conformal mapping, integration, series, and application.
MATH 445 Deterministic Models in Operations Research 3c-0l-3cr Prerequisites: MATH 122 or 124; 171 An introduction to using the basic tools of solving deterministic models in operations research. Includes optimization techniques and applications such as linear programming, nonlinear and dynamic programming, transportation models, and network models. In addition, sensitivity analysis, duality, simplex methods, and integer programming are discussed. Uses technology to solve problems and interpret the results.	MATH 445 Deterministic Models in Operations Research 3c-0l-3cr Prerequisites: MATH 122 or 225; 171 An introduction to using the basic tools of solving deterministic models in operations research. Includes optimization techniques and applications such as linear programming, nonlinear and dynamic programming, transportation models, and network models. In addition, sensitivity analysis, duality, simplex methods, and integer programming are discussed. Uses technology to solve problems and interpret the results.
MATH 446 Probabilistic Models in Operations Research 3c-0l-3cr Prerequisites: MATH 122 or 124; 171; 216 A survey of probabilistic methods for solving decision problems under uncertainty. Probability review, decision theory, queuing theory, inventory models, and Markov chains are covered. Uses technology to solve problems and interpret the results.	MATH 446 Probabilistic Models in Operations Research 3c-0l-3cr Prerequisites: MATH 122 or 225; 171; 216 A survey of probabilistic methods for solving decision problems under uncertainty. Probability review, decision theory, queuing theory, inventory models, and Markov chains are covered. Uses technology to solve problems and interpret the results.
MATH 447 Modeling and Simulation 3c-0l-3cr Prerequisites: MATH 122 or 124; 171; 216 Construction and solution of mathematical models. Emphasizes applications in areas such as logistics, natural and social sciences, and manufacturing. Discrete and continuous system models are analyzed using mathematical and computer-based methods. An introduction to computer simulation. An introductory course in differential equations is recommended but not required.	MATH 447 Modeling and Simulation 3c-0l-3cr Prerequisites: MATH 122 or 126; 171; 216 Construction and solution of mathematical models. Emphasizes applications in areas such as logistics, natural and social sciences, and manufacturing. Discrete and continuous system models are analyzed using mathematical and computer-based methods. An introduction to computer simulation. An introductory course in differential equations is recommended but not required.

MATH 451 Numerical Methods for Supercomputers 3c-0l-3cr Prerequisites: MATH 121 and 122, or MATH 123 or 127, MATH 171, COSC 250 Supercomputers make use of special computer architectures—vector and parallel processors—in order to achieve the fastest processing speed currently available. Students are introduced to these features and learn how numerical algorithms can be constructed to exploit supercomputers’ capabilities. They gain practical experience in programming for the Cray, YMP, in incorporating existing scientific software packages into user-written programs, in submitting remote jobs to the Pittsburgh Supercomputer Center, and in producing animated graphical output to summarize the typically large volume of output data generated by large scientific programs. (Also offered as COSC 451; may not register for duplicate credit)	MATH 451 Numerical Methods for Supercomputers 3c-0l-3cr Prerequisites: MATH 121 or 125; 171, COSC 250/MATH 250 Supercomputers make use of special computer architectures—vector and parallel processors—in order to achieve the fastest processing speed currently available. Students are introduced to these features and learn how numerical algorithms can be constructed to exploit supercomputers’ capabilities. They gain practical experience in programming for the Cray, YMP, in incorporating existing scientific software packages into user-written programs, in submitting remote jobs to the Pittsburgh Supercomputer Center, and in producing animated graphical output to summarize the typically large volume of output data generated by large scientific programs. (Also offered as COSC 451; may not register for duplicate credit)
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Summary of the Proposed Revisions

The Mathematics Department has submitted a new calculus sequence MATH 125, 126, 225 to replace the calculus sequence MATH 123, 124. Calculus is a foundational course and hence a prerequisite for many of our courses. This means we need to change the prerequisites on many of our courses. In the transition years, overrides will be given for students who meet the old prerequisites.

Rationale for the Revisions

Very briefly, here are the topics in the new calculus sequence:

MATH 125: Limits, derivatives, rates of change, maxima/minima, basic integration

MATH 126: Integration and applications, very basic differential equations, sequences and series, introduction to vectors

MATH 225: Differentiation and integration in multivariable calculus

Very briefly, here are the topics in the old calculus sequence:

MATH 123: Limits, derivatives, rates of change, maxima/minima, integration and applications,

MATH 124: Very basic differential equations, sequences and series, introduction to vectors, differentiation and integration in multivariable calculus

MATH 219

The old prerequisite included MATH 123, the new one includes MATH 125.

MATH 241

The old prerequisite included MATH 124. Since multivariable calculus is not essential in this course, the new prerequisite includes MATH 126.

MATH 271

The old prerequisite included MATH 123. Since differentiation is the main prerequisite we need for this class, the new prerequisite will include MATH 125. We are adding MATH 121 as an option to accommodate students in the minor.

MATH 272

The old prerequisite included MATH 124. Since multivariable calculus is not essential in this course, the new prerequisite includes MATH 126.

MATH 342

The old prerequisite of MATH 241 also covered MATH 124 (and hence multivariable calculus). Since the prerequisite of MATH 241 no longer covers multivariable calculus, we have to add that to the prerequisites.

MATH 350

The old prerequisite included MATH 124. Since multivariable calculus is not essential in this course, the new prerequisite includes MATH 126.

MATH 363

The old prerequisite included MATH 124. Since multivariable calculus is used later in this course, the new co-requisite includes MATH 225.

MATH 421

The old prerequisite included MATH 124. Since multivariable calculus is not essential in this course, the new prerequisite should include MATH 126. However, MATH 126 is included in the other prerequisite, MATH 272, so it is eliminated because it is redundant.

MATH 423

The old prerequisite is MATH 124. Since multivariable calculus is essential in this course, the new prerequisite is MATH 225.

MATH 445

The old prerequisite includes MATH 124. Since multivariable calculus is essential in this course, the new prerequisite includes MATH 225.

MATH 446

The old prerequisite includes MATH 124. Since multivariable calculus is essential in this course, the new prerequisite includes MATH 225.

MATH 447

The old prerequisite included MATH 124. Since multivariable calculus is not essential in this course, the new prerequisite includes MATH 126.

MATH 451

The old prerequisite included MATH 123. Since differentiation is the main prerequisite we need for this class, the new prerequisite will include MATH 121 and MATH 125. The MATH 127 prerequisite is being dropped because the course is no longer offered. We added the MATH 250 option because COSC 250 is now cross listed with MATH 250.

III. Letters of Support

Computer Science

-----Original Message-----

From: Bill Oblitey [mailto:oblitey@iup.edu]
Sent: Friday 8 December 2006 9:51 AM
To: Gary.Stoudt@iup.edu
Subject: Re: Prerequisite Change Support

Gary,
The Computer Science Department is in support of your calculus revisions and their affected prerequisites. We held a meeting and discussed how our students will have to be advised based on the changes you are making and we have generated our advising schemes based on the changes.

We fully support your syllabi revisions and we are glad that you took the needs of our students in consideration.

Bill Oblitey

Chemistry

-----Original Message-----

From: John Woolcock [mailto:woolcock@iup.edu]
Sent: Wednesday 13 December 2006 2:45 PM
To: Gary Stoudt
Subject: Fwd: Prerequisite Change Support

Gary,

The Chemistry Department supports the changes in pre-requisites listed below. If you need a more "official" letter, let me know.

Cheers,
John

Begin forwarded message:

> From: "Wendy Elcesser" <endyw@iup.edu>
> Date: December 13, 2006 1:18:50 PM EST
> To: "John Woolcock" <woolcock@iup.edu>
> Cc: "Sowa, Sharon " <Sharon.Sowa@iup.edu>, "Kondo, Anne E" <Anne.Kondo@iup.edu>, "Michael Briggs" <mbriggs@iup.edu>, "Elcesser, Wendy L" <Wendy.Elcesser@iup.edu>
> Subject: Re: Prerequisite Change Support
>
> John,
> The curriculum committee considers these changes to be the result of

> the recent revisions in the Calculus courses which we have previously
> supported and has no objection to these changes.
>
> Thanks for reading.
>
> Wendy
> ----- Original Message -----
> From: John Woolcock
> To: Wendy Elcesser
> Sent: Saturday 9 December 2006 11:18 AM
> Subject: Fwd: Prerequisite Change Support
>
> Wendy,
>
> These changes seem pretty straightforward. Pass them along to the
> Curriculum Committee and let me know their recommendation.
>
> Cheers,
> John
>

Physics

From: hershman [hershman@iup.edu]
Sent: Friday 2 February 2007 12:33 PM
To: Gary.Stoudt@iup.edu
Subject: Re: Support for Prerequisite changes

Gary,
The Physics Department approved the calculus course revision and, we hereby
support the "prerequisite" changes necessitated by the phasing out of the previous
calculus sequence and its replacement by the new calculus sequence.
Ken

Ken Hershman
Chairman
IUP Physics Department

----- Original Message -----
From: "Gary Stoudt" <Gary.Stoudt@iup.edu>
To: "'Ken Hershman'" <hershman@iup.edu>
Sent: Friday, February 02, 2007 11:42 AM
Subject: Support for Prerequisite changes

> Ken,
>
> Can we get a letter of support from you for the attached prerequisite
> changes? The changes are just substituting the new calculus sequence for
> the old one. Thanks. I believe this will be the last support we will
> need
> from you. ;-)
>
> Gary
>
> Gary Stoudt
> Mathematics Department