

07-49
App-3/18/08
Info.-4/22/08

Undergraduate Distance Education Review Form

(Required for all courses taught by distance education for more than one-third of teaching contact hours.)

Existing and Special Topics Course

Course: MATH121 Calculus I for Natural and Social Sciences

Instructor(s) of Record: Dr. Frederick Adkins

Phone: 724-357-3790

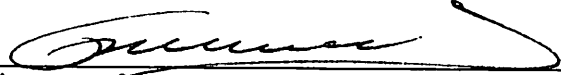
Email: fadkins@iup.edu

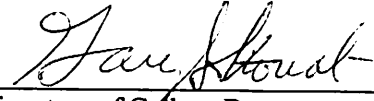
Step One: Proposer

A. Provide a brief narrative rationale for each of the items, A1- A5.
These items are included in the attached appendix.

Step Two: Departmental/Dean Approval

Recommendation: Positive (The objectives of this course can be met via distance education)
 Negative

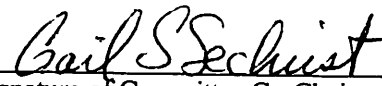
 2/22/08
Signature of Department Designee Date

Endorsed:  2-27-08
Signature of College Dean Date

Forward form and supporting materials to Liberal Studies Office for consideration by the University-wide Undergraduate Curriculum Committee. Dual-level courses also require review by the University-wide Graduate Committee for graduate-level section.

Step Three: University-wide Undergraduate Curriculum Committee Approval

Recommendation: Positive (The objectives of this course can be met via distance education)
 Negative

 3-18-08
Signature of Committee Co-Chair Date

Forward form and supporting materials to the Provost within 30 calendar days after received by committee.

Received

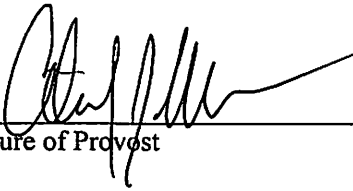
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Liberal Studies

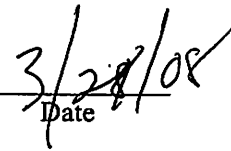
Step Four: Provost Approval

Approved as distance education course

Rejected as distance education course



Signature of Provost



Date

Forward form and supporting materials to Associate Provost.

Appendix: Required Materials and Documents

Step One: Proposer

A. Provide a brief narrative rationale for each of the items, A1- A5.

A1. How is the instructor qualified in the distance education delivery method as well as the discipline?

The instructor of record is Dr. Frederick Adkins. He has a Ph.D. in Applied Mathematical and Computational Sciences from The University of Iowa. In addition to having taught an online version of MATH115 five times since 2005, Dr. Adkins has been actively involved in distance education since 1999. In 1999, Dr. Adkins was selected for and participated in the IUP Instructional Design Center WebCT Development Stipend Program. This was a week-long intensive introduction to WebCT including the opportunity to build a WebCT course. Dr. Adkins used this experience to add supplemental WebCT based material to his MATH123 and MATH124 courses. In the following year, Dr. Adkins attended a workshop "CAPE— Distance Education / Videoconference Operator Training" which was held at IUP. This training focused on communication needs and operation of videoconference equipment.

In addition to directly teaching online classes, Dr. Adkins has had an active role in shaping the future of distance education in the Pennsylvania State System of Higher Education. From 2000-2004 he was the technical specialist for the PASSHE Center for Distance Education and the Keystone University Network. He provided software development and support for the State System's WebCT and Blackboard installations. From 2002-2004 he was a member (with Dr. Kolb) of the planning and oversight team the "Keystone University Network Workgroup."

Through his involvement in statewide distance education activities, Dr. Adkins participated in the "EDU101: Online Instructor Certificate Course." This is an eCollege Online Course taken during 2001-2002 for training faculty to teach courses online.

Dr. Adkins has also participated in a variety of activities and conferences focusing on distance education including:

- SSHE Network Operations Center--- MCU Videoconference Operator Training. October 10-11, 2000. A selected group of faculty and technical staff across the PASSHE participated in this two day training workshop on usage of videoconferencing multipoint control unit (MCU) bridge operation and distance education hardware.
- Blackboard Users Summit 2001, Washington, DC. April 5-6, 2001. This was a symposium sponsored by Blackboard to showcase online education.
- *Educause 2001 Conference. Indianapolis.* October 28-31, 2001. Educause is an organization with a dedication to serving the technology needs of higher education. I went to this conference with the specific purpose to meet with the Independent Blackboard Users Group.
- Blackboard Users Conference 2003, Baltimore, MD. February 25-27, 2003.
- Reviewer of the 2004 PASSHE Distance Education Program Investment Grants

Dr. Adkins has used and shared the skills he acquired through workshops and activities such as:

- Presenter at "Faculty Professional Development Day: Hands-on WebCT workshop," California University of Pennsylvania, May 2001.
- By supporting activities at "Emerging Educational Technologies Conference," Lock Haven University of Pennsylvania May 2000.
- Participant as a faculty consultant for PASSHE Online Learning Network RFP Vendor Interviews in Harrisburg (2001).

A2. How will each objective in the course be met using distance education technologies?

Course objectives and corresponding distance education implementation are given below:

1. Students will understand and take advantage of pattern recognition in the study of mathematics.

Students will practice recognizing the structure of algebraic expressions related to the rules of calculus. In exercise sets, students will be asked to self-discover the rules by reviewing a series of specific examples. They will then validate or improve their rules by reviewing additional examples. This material is also presented in video-lecture content and textbook readings.

2. Students will make a careful study of functions and their application to the natural and social sciences.

Modeling natural and social science applications with mathematics is integrated throughout the course. Exercise sets for almost every section of the textbook include written homework exercises that ask the student to model real-world problems. Additionally, video-lecture content will cover application of calculus to exploration and modeling of natural and social science problems.

3. Students will understand how to interpret functions expressed analytically and graphically.

The online environment uniquely ties technology to the learning process. Computer software will be used to aid students in graphing and exploring the properties of functions. Students also have the option of using a graphing calculator in addition to computer software. One of the roles of calculus is to enable students to uncover interesting features of functions without the need for technology. Occasionally, technology gives misleading results or hides important details regarding the graphical interpretation of functions. Students will use calculus to explore situations where the technology may not provide sufficient detail or when calculus indicates a more careful investigation is needed.

4. Students will understand the limit process and how it pertains to functions in the natural and social sciences.

The idea of limit is central to understanding calculus. In both derivative and integral calculations, students will use the computer interface to model approximations to tangents to functions and area under curves. These models will use successively better approximations (hence the limit process). Students will thus be able to visualize the limit process and see its effect on calculating the derivative and the Riemann sum.

5. Students will be able to calculate the derivative of a function and interpret its meaning.

Through the interactive online exercises, students will be required to symbolically enter results as they calculate derivatives. These solutions will be automatically checked by computer software. The online software checks for common mistakes and provides students feedback prompts to correct any errors. Through written homework assignments, application problems, discussion board postings, and examination questions students will be asked to provide written responses that interpret the meaning of their calculations.

6. Students will be able to calculate the integral of a function and interpret its meaning.

Through the interactive online exercises, students will be required to symbolically enter results as they calculate integrals. These solutions will be automatically checked by computer software. The online software checks for common mistakes and provides students feedback prompts to correct any errors. Through written homework assignments, application problems, discussion board postings, and examination questions students will be asked to provide written responses that interpret the meaning of their calculations.

7. Students will leave the course with a solid set of skills and a conceptual framework to equip the students for future study.

The course concludes with a final project and a final exam. These materials are submitted in hard copy to the instructor providing practice and evidence of the student's solid set of skills and conceptual framework developed through the course.

A3. How will instructor-student and student-student, if applicable, interaction take place?

Material for the online course includes interactive exercises that use computer generated prompts to address student questions and give hints for subsequent steps. Additionally, there are video mini-lectures, audio clips annotating step-by-step solutions, and online try-it-yourself exercises. It is anticipated that a hyper-linked online textbook will be used to direct students to read and review necessary textbook pages. Instructor will provide interactive assistance during "office hours" via use of web-based videoconferencing software, use of chat rooms, and by telephone. Instructor-student interaction will also occur through email, discussion board postings, and by exchange of documents including fax, electronic, and postal mail.

Students are required on a weekly basis to contribute and respond to discussion board postings tied to course content. This is the foundation for the student-student community. Students will also be encouraged to exchange email addresses for additional peer collaboration.

A4. How will student achievement be evaluated?

Students will be required to complete written homework assignments, take online quizzes, and complete examinations over chapters of material. Students will have a project to complete at the end of the semester that uses content spanning the entire course.

A5. How will academic honesty for tests and assignments be addressed?

Written homework exercises will be submitted by either US Postal Mail, scanning and emailing, or by fax. Homework should be the student's own work (verified by handwriting consistency), but students are allowed to seek help from a qualified tutor. Student discussion board postings are reviewed and reply comments are posted online with expected follow-up email messages sent to and from the instructor. This interaction allows instructor to gauge originality of student work. Online quiz and exam materials are algorithmically generated so each student receives different numbers in similar type problems. As the students have both time limitations and receive different problems this helps eliminate cheating. Instructor is considering using proctored testing services for the final exam.

- B. Submit to the department or its curriculum committee the responses to items A1-A5, the current official syllabus of record, along with the instructor developed online version of the syllabus, and the sample lesson. This lesson should clearly demonstrate how the distance education instructional format adequately assists students to meet a course objective(s) using online or distance technology. It should relate to one concrete topic area indicated on the syllabus.**

These items are presented on subsequent pages.

B1. Current Official Syllabus of Record

I. Catalog Description

MATH 121 Calculus I for Natural and Social Sciences	4 credits 4 lecture hours (4c-0l-4sh)
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Prerequisites: MATH 105 or MATH 110 or appropriate Placement Test Score or permission of the Mathematics Department Chairperson.

Note: A student may not take MATH 121 after successfully completing a calculus course without the written approval of the mathematics department chairperson.

This course offers a review of elementary functions, including logarithmic and exponential functions. Natural and Social Science majors are introduced to the central ideas of calculus, including limit, derivative and integral. Applications to natural and social sciences are emphasized.

II. Course Objectives

1. Students will understand and take advantage of pattern recognition in the study of mathematics.
2. Students will make a careful study of functions and their application to the natural and social sciences.
3. Students will understand how to interpret functions expressed analytically and graphically.
4. Students will understand the limit process and how it pertains to functions in the natural and social sciences.
5. Students will be able to calculate the derivative of a function and interpret its meaning.
6. Students will be able to calculate the integral of a function and interpret its meaning.
7. Students will leave the course with a solid set of skills and a conceptual framework to equip the students for future study.

III. Course Outline

A. Functions (4 hours)

1. Real Numbers, Inequalities, and Lines
2. Exponents
3. Functions
4. Functions, Continued

This is intended as a short review of pre-calculus. All of this material is covered extensively in MATH 105 or MATH 110.

B. Derivatives and Their Uses (11 hours)

- 1) Limits and Continuity
- 2) Slopes, Rates of Change, and Derivatives
- 3) Some Differentiation Formulas
- 4) Product and Quotient Rules
- 5) Higher-Order Derivatives
- 6) Chain Rule and Generalized Power Rule
- 7) Nondifferentiable Functions

- C. Further Applications of Derivatives (11 hours)
 - 1. Graphing Using the First Derivative
 - 2. Graphing Using the First and Second Derivatives
 - 3. Optimization
 - 4. Further Applications of Optimization
 - 5. Optimizing Harvest Size
 - 6. Implicit Differentiation and Related Rates

- D. Exponential and Logarithmic Functions (6 hours)
 - 1. Exponential Functions
 - 2. Logarithmic Functions
 - 3. Differentiation of Logarithmic and Exponential Functions

Reminder: Items 1 and 2 are a review from MATH 105/110.

- E. Integration and Its Applications (11 hours)
 - 1. Antiderivatives and Indefinite Integrals
 - 2. Integration Using Logarithmic and Exponential Functions
 - 3. Definite Integrals and Area
 - 4. Further Applications of Definite Integrals
 - 5. Integration by Substitution

- F. Additional Topics in Integration (9 hours)
 - 1. Integration by Parts
 - 2. Integration Using Tables
 - 3. Improper Integrals
 - 4. Numerical Integration

The remaining eight hours are for four review classes and four tests.

IV. Method of Instruction

This course is taught in a traditional classroom setting involving lecture, student participation in class, homework assignments, and written in class evaluations. Instructors are free to assign optional projects that may or may not involve graphing technology.

V. Evaluation Methods

The final grade for the course will be determined as follows:

50% Tests. Tests will include problems on basic competency and critical thinking.

20% Final Examination. The final examination will be comprehensive and cover both basic competency and critical thinking.

30% Homework, Quizzes, and Projects. These will cover textbook assignments and applications.

Grades will be assigned as follows:

A: 90%-100%

B: 80%-89%

C: 70%-79%

D: 60-69%

F: 0%-59%

VI. Required Textbook

Berresford, Geoffrey C. and Andrew M. Rockett. Applied Calculus (2nd edition). Boston: Houghton Mifflin Publishing Company, 2000.

VII. Special Resource Requirements

Some instructors may require students to purchase a graphing calculator.

VIII. Bibliography

Committee on the Mathematical Sciences in the Year 2000. Everybody Counts: A Report to the Nation on the Future of Mathematics Education. Washington, DC : National Academy Press, 1989.

Hughes-Hallet, Deborah, et al. Applied Calculus. New York: John Wiley & Sons, Inc., 1999.

Ostebee, Arnold, and Paul Zorn. Calculus from Graphical, Numerical, and Symbolic Points of View. Stamford, CT: Harcourt, 1997.

IX. Student Enrollment

This course is offered every semester and the average enrollment is 210 students.

B2. Instructor syllabus:

Instructor Syllabus

MATH 121 Calculus I for Natural and Social Sciences

Section 801 - 4 credits

Instructor:

Dr. Frederick Adkins
212 Stright Hall
Indiana University of Pennsylvania
Indiana, PA 15705
Work Phone: (724)357-3790
Home Phone: (724)349-7346 (please no calls after 9:00pm)
Email: fadkins@iup.edu

Description (From Catalog):

This course offers a review of elementary functions, including logarithmic and exponential functions. Natural and Social Science majors are introduced to the central ideas of calculus, including limit, derivative and integral. Applications to natural and social sciences are emphasized.

Prerequisites: MATH 105 or MATH 110 or appropriate Placement Test Score or permission of the Mathematics Department Chairperson.

Note: A student may not take MATH121 after successfully completing a calculus course without the written approval of the mathematics department chairperson.

Required Textbook:

Lial, Greenwell, and Ritchey. (2007). *Calculus with Applications, Brief Version*. 9th Edition, New York: Addison-Wesley. ISBN: 0321422740

For more details on the text, see: <http://hawk.ma.iup.edu/math121/book/>

Technology:

Students will need to install free plugins for MathXL available at:

<http://www.mathxl.com/info/wizard.asp?bookCode=cwa81&mml=yes>

Also from this site, you will need to download software for Adobe Acrobat Reader, Macromedia Flash Player, RealPlayer, and QuickTime Player unless you already have this software. There may be additional plugins required depending on your computer's operating system. It is suggested to use Microsoft Internet Explorer for the browser.

Students should also have access to software similar to Microsoft Word and Excel.

Evaluation Methods:

The final grade will be determined as follows:

Grade	Weighted Percentage of Points Earned
A	90% -- 100%
B	80%-- 89%
C	70%-- 79%
D	60%-- 69%
F	below -- 60%

Your points total and grade is composed of:	
7 Chapter Quizzes (7% of your grade each)	49%
Comprehensive final (on last day of class)	20%
Discussion Questions / Responses (1% each chapter)	7%
Computer Based Homework Exercises	17%
Pencil and Paper Homework Journal	7%

Course Outline

- A. Functions (4 class hours)
 - 1. Real Numbers, Inequalities, and Lines
 - 2. Exponents
 - 3. Functions
 - 4. Functions, Continued

- B. Derivatives and Their Uses (12 class hours)
 - 1. Limits and Continuity
 - 2. Slopes, Rates of Change, and Derivatives
 - 3. Some Differentiation Formulas
 - 4. Product and Quotient Rules
 - 5. Higher-Order Derivatives
 - 6. Chain Rule and Generalized Power Rule
 - 7. Non-differentiable Functions

- C. Further Applications of Derivatives (12 class hours)
 - 1. Graphing Using the First Derivative
 - 2. Graphing Using the First and Second Derivatives
 - 3. Optimization
 - 4. Further Applications of Optimization
 - 5. Optimizing Harvest Size
 - 6. Implicit Differentiation and Related Rates

- D. Exponential and Logarithmic Functions (8 class hours)
 - 1. Exponential Functions
 - 2. Logarithmic Functions
 - 3. Differentiation of Logarithmic and Exponential Functions

- E. Integration and Its Applications (12 class hours)
 - 1. Antiderivatives and Indefinite Integrals
 - 2. Integration Using Logarithmic and Exponential Functions
 - 3. Definite Integrals and Area
 - 4. Further Applications of Definite Integrals
 - 5. Integration by Substitution

- F. Additional Topics in Integration (8 class hours)
 - 1. Integration by Parts
 - 2. Integration Using Tables
 - 3. Improper Integrals
 - 4. Numerical Integration

The remaining 4 class hours are for examination and review.

Expectations:

I expect that you:

- Take responsibility for your own learning.
- Complete homework as indicated and in the manner described.
- Read the assigned material in addition to completing the exercises.
- Keep pace with the material-- this requires working on a daily basis.
- Seek assistance when difficulty arises.
- Take notes when appropriate and actively participate in web-based classroom activities.

You can expect from me:

- Assistance during posted office hours or by appointment.
- Timely return of materials.
- Clarity of my expectations and intentions.
- Fairness and reasonableness.

I am willing to help you in any way I can to succeed in this course, but I also expect you to be working hard toward the same goal.

Recommendations:

As the semester progresses you will develop habits as to how you study and do your work for your classes. It is important to begin the semester in the way you would like to finish it; consistent work and time spent on material as it is covered will dramatically increase your understanding, ability to keep pace with the course, and (from a student's perspective) should save time when compared to trying to catch-up and cram at the end of a semester.

Even though this is a web-based class, you should keep a notebook just like you would in a classroom lecture-based class. You should read the textbook. You should also be asking yourself questions like "is this clear to me?" or "do I need to see more examples of this?" as you are going through the online material. These are the types of questions you might be asked by a traditional classroom instructor—in a web-based class you need to *monitor your own learning* and *seek additional help when needed*.

This is Part I of the official syllabus. Be sure to print and read Parts II and III which provide more details about what you should be doing to be successful in this online class.

Syllabus Part II

Tips for Success in MATH121 Online!

If this were a regular classroom course it would meet 4 days a week for 15 weeks and have 50 minutes of class time each day plus the necessary time (1-3 hours per day) to do homework. This is 60 class periods plus at least 60 hours of homework, for a total of at least 120 hours. In an online class, all the time is really “home”work.

Part of the reason to take an online class is flexibility of choosing your own hours. Some students will take more, some less, but you need to **set a regular time when you can work about two hours of time on this class** each day.

Tip 1) Understand how you are being evaluated.

7 Chapter Quizzes (7% of your grade each)	49%
Comprehensive final (on last day of class)	20%
Discussion Questions / Responses (1% each week)	7%
Computer Based Homework Exercises	17%
Pencil and Paper Homework Journal	7%

Tip 2) For the pencil and paper homework exercises you should be keeping a hand-written journal of the work you do throughout the semester. The course web site and “Part III” of the syllabus lists these end of the section textbook exercises.

You should be completing these pencil and paper exercises in addition to the computer-based online homework exercises. It makes sense that more practice on homework exercises will improve your performance on chapter quizzes.

YOU MUST SHOW YOUR WORK WITH DETAIL TO GET CREDIT!

You can choose to hold onto the pencil and paper exercises and submit them with your final exam, or you can mail or drop off the exercises from the first half of the class at the end of October. I will review and return these. In order to receive credit you need to postmark your pencil and paper journal with your final exam within 2 business days of December 11. Mail to: Dr. Frederick Adkins, Mathematics Dept, Indiana University of Pennsylvania, Indiana, PA 15705. If you ask for the “Media Mail” rate for your notebook, it will cost less. If you live close to IUP, you can also drop your journal off at the Math Department Office STR233.

Tip 3) Be responsible for your own learning. Only you will know if you do not understand the material. I will be able to review your comprehension via your quiz and exam grades, but that is too late. You need to deal with problems/difficulties as they arise. You need to determine when some concept or type of problem is not clear to you and then follow-up on this by seeking a solution to your question. There are a variety of resources: reading the textbook, viewing video lectures online, finding online computer exercises with the ‘help me solve this’ feature, contacting the tutor center (see Tip 7), or email/phone to the instructor.

Tip 4) Many students make the mistake in a regular classroom college course of thinking that they should work alone to master the material. Of course the actual graded work (materials turned in and taking of exams/quizzes) needs to be your own unique effort. However, I encourage you to seek assistance in the form of tutoring and group interaction. One might think that this is impossible in an online setting, but I am going to have a question/answer web-based bulletin

board/discussion list. You will see from the syllabus that you must post at least one **meaningful** question *each week* and contribute responses or answers to at least two questions *each week*. Questions can be about content (like “I do not understand how to evaluate the limit of a fraction when the denominator is zero”) or problems (like “How can you evaluate $\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1}$ ”). Responses should include specific reference to the solution such as a page number or a web link or your personal solution technique. Postings like “I don’t understand this either” are appropriate, but do not count toward your required postings as either your question or a response. Questions you write about in your journal for which you cannot find an answer on your own are OK for posting on the discussion list.

Tip 5) Know and follow the progress deadlines:

Quizzes are computer generated and will be available for specific dates throughout the semester. The seven quizzes cover material from about one chapter each as shown in the table below. You should try to keep pace with the material as shown in the table. You should be completing approximately one quiz per week. In order to allow you to get up to speed, the first quiz will be available until September 14th. However, you should be completing the quizzes *earlier* during the weekly dates shown. This is to keep you on pace to complete the course by December 10th.

You are supposed to take each quiz only ONCE. The system has the option to take the quiz a “second” time. This second chance is only to be used in case of computer problems. In the event of computer malfunction, power outage, etc. the quiz software should allow you to login again and continue the quiz where you stopped. In the event that a partially completed quiz is not saved you should utilize the “second” quiz.

Essentially you need to be covering a little more than a chapter every two weeks. Here is the suggested schedule:

August 28-December 11--- Section 801:

Week Number	1-2	3-4	5-6	7-8	9-10	11-12	13-15
Dates of Week (Mon-Sun.)	8/25-9/7	9/8-9/21	9/22-10/5	10/6-10/19	10/20-11/2	11/3-11/16	11/17-12/8
Material to Learn	Ch R & Ch1	Ch 2 & 3.1	Ch 3	Ch 4	Ch 5	6.1-6.5	7.1-7.5 & 8.1-2
Must Take Quiz by Date	9/14	10/12	10/12	11/9	11/9	12/7	12/10 Also: Final Exam on 12/10-12/12

Tip 6) There is a four step process you should use when covering material from each section of the textbook.

Step 1: Each day you work on content in this course you should start in the "**Lessons/Tasks**" section for the chapter that you are working on.

Step 2: After completing the instructional material indicated in "Lessons/Tasks" for a section of the book, you should **read over that section in the textbook.**

Step 3: Next you should go to "**Online Homework**" and complete the problems for that section.

The "Online Homework" problems generally have built-in feedback and additional opportunities to help you learn the content better. You should be using the "View An Example", "Help Me Solve This", "Video", "Animation", and "Textbook Pages" features displayed in each problem.

Step 4: Once you have mastered the "Online Homework" exercises, **do the assigned pencil & paper homework problem in your journal.** Make sure you label and date each set and check your answers with the odd numbered solutions in the back of the textbook.

Tip 7) Know what resources are available to help you.

Student Technical Support and Phone Tutoring

For MyMathLab Website Usage and Installation Tech Support:

Monday-Friday

9 AM - 6 PM Eastern Standard Time

Phone: 1-800-677-6337

Email: support@coursecompass.com

MyMathLab includes FREE access to the AW Tutor Center.

That's right -- Free phone tutoring!

Free Phone Tutoring

Sunday to Thursday 5pm – Midnight/12am EST.

Toll free 888-777-0463

You will need to know your CourseID to use this service. It is **adkins12090.**

(If you make use of the phone tutors, let me know if they did a good job. I'd appreciate your feedback!)

If you have local access to campus, IUP has "Homework Helper" math tutoring in Pratt Hall. These hours are not posted yet, but have typically been Mon-Thurs 6-9pm.

I will be posting my office hours on a weekly basis in the www.coursecompass.com site. Feel free to call me and email questions at other times too. I am here to help you! Ask when you have questions.

Syllabus Part III
MATH121 Online Fall 2008
Dr. Adkins

This section covers the “Pencil and Paper End of Section Exercises” to be done in your journal.
Note: these exercises are practice *and learning* that you should be completing for every section.

Please mark the section number at the top of each page in your journal. Start each section on the top and front side of a new piece of paper (this is to help me in giving you credit for your work).

Number and complete each problem in a neat and clear manner. You need to show the details of your work on each problem for credit. Credit will not be given for just the answer as most of these have solutions in the back of the textbook. You should also be checking your own answers with those in the back of the textbook.

Section Assigned problems.

- R.1 #3,13,21,24
- R.2 #1,5,9,15,24
- R.3 #9,14,21,33,37
- R.4 #2,9,19,26,27,34
- R.5 #3,11,15,23,31,43
- R.6 #1,3,7,10,15,21,37,49,51
- R.7 #1,17,21,25

- 1.1 #1,3,13,15,19,29,45,53,61,63,71
- 1.2 #1,5,7,11,13,15,17,18,19,23,27
- 1.3 #3,5,7,9,18

- 2.1 #1,3,11 (Solve for y first), 29,33,41,45,49,51,67 (see page 50 for fig 1.a), 73,75
- 2.2 #3,4,5,6,7,9,20,21,22,23,24,29,43,49,51
- 2.3 #1,2,3,7,9,11,13,15,21,25,27,37,39,43,46,47,48
- 2.4 #1 (Hint: How thick is 1 sheet?), 2,5,6,7,9,11,12,13,15,19,27,30,33,37,39,42
- 2.5 #1,5,7,11,13,19,23,25,29,31,37,47,51,59,69,77
- 2.6 #1,3,6,7,13 (\$7300 is due in 3 years @ 11%), 15,17,19,21,25,31, 37,39

- 3.1 #1,2,3,4,9,11,13,21,23,25,29,31,33,43,45,47,49,53,57,75,76,81
- 3.2 #1,3,5,9,11,19,25,33,35
- 3.3 #1,9,23,25,29,37,41
- 3.4 #3,5,11,15,17,23,33,37,45,47
- 3.5 #1,3,7,15,17

- 4.1 #1,7,11,13,19,26,27,29,31,37,41,50,51,53,61,67,71
- 4.2 #1,5,17,19,27,29,31,35,39,43
- 4.3 #1,3,7,21,23,27,29,35,45,51,52,55,59,65 part a and b.
- 4.4 #1,11,15,21,25,29,33,37,42,45,53
- 4.5 #1,7,15,31,37,49,53

- 5.1 #1,5,11,15,19,29,35,44,49
- 5.2 #1,5,9,15,21,25,29,30,31 (Hint: Graph formula for $f'(x)$ and look where crosses x-axis), 35,39,45

- 5.3 #1,3,13,19,25,27,35,39,43,51,59
5.4 #3,7,11,29
- 6.1 #7,9,11,19,29,33,35,47
6.2 #1,7,9,13,17,23 (see example #3)
6.3 #3,5,9,17,21,23
6.4 #1,5,15,17,23,30,37
6.5 #1,5,9,11,24,27
- 7.1 #1,5,7,11,13,15,19,25,31,37,44,45,49,53,57,65,67
7.2 #1,2,3,5,7,9,13,17,29,31,37
7.3 #1,3,7,15,17 (Hint: graph of $\sqrt{9-x^2}$ is part of circle; what's the radius?), 23 part (a)
only, 35
7.4 #3,5,9,15,17,21,31,41,53
7.5 #1,7,11,25,29,33
- 8.1 #3,9,13,15,25 (Hint: see Appendix formula #9), 33

(This is the “welcome letter” emailed to each student as they register for the class)

Welcome to MATH121 online!

I am glad to have you in class!

As the class officially starts on August 25th, I thought that I would introduce myself, explain how the online class will work, and let you know what materials you will need to participate in the class.

About the Instructor:

I have been teaching in the Math Department at IUP since 1996. Prior to this, I taught for the Math Department at the University of Iowa while I completed my Ph.D. in Applied Mathematics and Computational Sciences and a Master’s degree in Mechanical Engineering. My teaching responsibilities at IUP range from basic algebra to graduate courses. I regularly teach courses in calculus – like MATH121 (which is an applied calculus course with an emphasis on applications appropriate for natural and social sciences). I have taught about thirty sections of calculus in my twelve years at IUP.

In addition to teaching math courses at IUP, I am also involved in computer applications. I occasionally teach courses related to computer science. Additionally, I am one of the founding co-directors of the IUP Software Development Center. From 1999-2004, I was also the technical specialist for the Keystone University Network and the Pennsylvania State System of Higher Education’s Center for Distance Education. In this role I provided software development, support, and training for faculty and students in distance education classes statewide. In addition to my supporting role for statewide distance education, I have taught MATH115 five times as an online course. I look forward to working with each of you to make this a great learning experience.

How the online class will work:

You will need a PC-compatible computer with web-access to access the instructional content. You will also need the course textbook that comes bundled with a website access code. Later in this letter I will give the details of the required textbook.

The class is mostly asynchronous and web-based. Asynchronous essentially means without a synchronized time schedule, i.e. there is not a “class time”. You will be able to do the homework, review of instructional content, and take the exams at any time of the day you choose. There will be progress deadlines that you will have to meet in order to keep you on pace with the material. Students will be allowed to work ahead with content and homework. This will be detailed in the course syllabus. You must also set-up/read your IUP email to get class information and updates: see <http://www.iup.edu/distance/admin/accessemail.shtm>

Much of the online material you will be accessing for the course comes from Addison-Wesley’s MyMathLab. MyMathLab is a website that provides the framework for you to interact with the mathematics content. Much of the content in MyMathLab requires installation of some browser plug-ins (free software that runs inside of the web browser). **I suggest that you use Microsoft’s Internet Explorer to access the material** (other browsers may work for some but not all of the MyMathLab content and the publisher discourages their use). There is a plug-in installation web page that will guide you through the process. I also have a toll-free number that you can call for assistance (see

below). You will need to have some administrative computer privileges in order to install the plug-ins. This is generally the default on most home computers and the installation web page is easy to use. However, if you intend to access the homework exercises through a computer lab, library, or other public resource, you may need to plan ahead to have the computer lab administrator install the plug-ins on the computer you will be using. I am willing to work with public lab administrators whom you request to install the plug-ins.

I plan to have a session during the first week of class for those that are within short driving distance of IUP to come to campus for an orientation on use of the MyMathLab software, on installation of the plug-ins, help with setting up your IUP email account, and for any questions you might have. This session is not required. I realize that not everyone will need to attend this session and it is difficult to find a time that works for those who would like to attend. If you are interested in attending please send me an email: fadkins@iup.edu, so I can find a time that works for you!

During this session I will give a brief computer-based tour of the MyMathLab course supplement. As a preparation and introduction, please access the following link:

<http://awhe.webex.com/awhe/playback.php?FileName=http%3A//www.aw-bc.com/orientation/webex/mymathlab.wrf>

This is a WebEX Movie (plays through a self-installing applet ... just click on accept content from WebEX) that gives some details about what the software can do and how you will use MyMathLab. This takes about 4 minutes.

You may wish to have access to a graphing calculator, but this is not required and I will suggest some free software alternatives. Graphing calculators are nice because you do not need to be by a computer when doing pencil and paper homework exercises.

Registering for MyMathLab

You might want to register for MyMathLab and try out the "review" homework exercises prior to the beginning of class. You should have another email attachment that contains the instruction document for registering and logging into MyMathLab. Registration is easy and most of you will **not** need to review the instruction document. Start the registration by going to <http://www.coursecompass.com>, and clicking on "Register". Be sure to read the part of this letter below on the required textbook before doing the registration. You will need to know the "instructor's course ID": **adkins12090**. Please give your first and last name the same way IUP has you listed when registering. Also do not give a middle initial. Once you are registered, click on "DO HOMEWORK" and try the exercises for the Review Chapter.

The Student Tech. Support number can be helpful if you are having any problems in the registration or plug-in installation: 1-800-677-6337 OR support@coursecompass.com

As we begin this journey through calculus together, feel free to contact me with any questions or comments:

fadkins@iup.edu

(724) 357-3790 (work) (724) 357-7908 (fax)

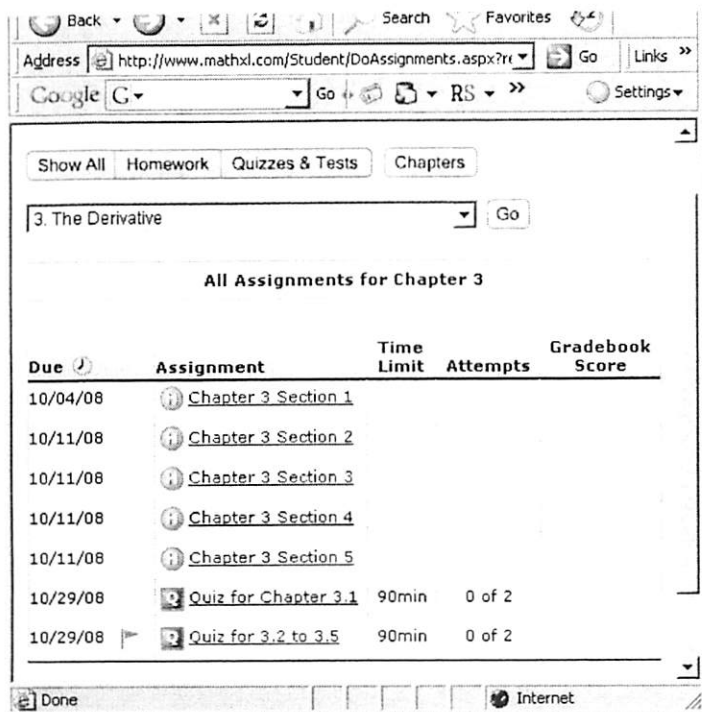
(724) 349-7346 (home, please no calls after 9pm)

212 Stright Hall, Math Dept. IUP

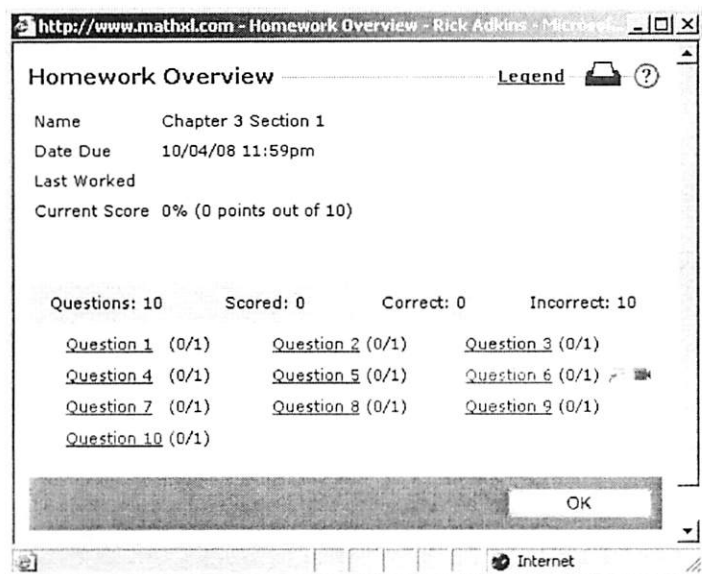
Indiana, PA 15705

B3. Sample Lessons / Sample Exercises.

After reviewing instructional content (video and interactive text) on a section, the student will be prompted to start doing homework problems. The screen below shows the homework problem index.



After selecting a section to work on, the student is shown a screen like:



The exercises with the video camera key indicate that there is a video clip to provide instruction for that type of exercise.

Students can work on exercises in any order they choose and have a variety of tools available to help them while the complete the exercises. As you can see from the sample problem below, there are links for "Help Me Solve This" which step the student through the current problem, "View an Example" which shows the student how to solve a similar problem, "Video" which is a video clip giving

instruction on the theory behind a problem, “Textbook Pages” which hyper-link directly to the content related to this problem in the online textbook, and “Ask My Instructor” which sends the instructor and email with the students question.

Address | http://www.math.d.com/Student/PlayerHomework.aspx?homeworkId=1739613&questionId=90&fromPlayerCheck=yes

Google | Go | RS | Bookmarks | PageRank | Popups okay | Settings

Homework Chapter 2 Section 1 Homework Overview Back to Homework & Tests

Questions << 1 2 3 4 5 6 7 8 9 >> Risk Admin

Determine the domain of the function.

$$f(x) = \sqrt{2-x}$$

Choose the domain of $f(x)$.

A $(-\infty, 2]$

B $(-\infty, 2)$

C $(-\infty, \infty)$

D $[2, \infty)$

Click to select your answer, then click Check Answer.

Check Answer Clear Answer Problem Progress Submit Work

Help Me Solve This View an Example Videos Textbook Pages Ask My Instructor Print

Exercise Score: 1 of 1 pts
Homework Score: 11.1% (1 of 9 pts)

Done Internet

Questions often have multiple parts to connect ideas from new content. For instance, a question could ask the student to determine whether the graph is symmetric to the y-axis. As a second part of that problem, the student is next asked to determine that this is equivalent to being an even function. Or a question could ask the student to find the rate of change of a population, and then find the marginal rate at some specific population level.

Many of the problems are interactive-open entry, asking the student to type in their solutions. See:

Homework Chapter 4 Section 5

Exercises << 1 2 3 4 5 6 7 >>

Find the derivative.

$$f(x) = \log_2((9 - 3x^2)^{5/2})$$

$f'(x) =$