

Submit original with signatures + 1 copy + electronic copy to Faculty Senate (Box 7500). See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for a complete description of the rules governing curriculum & course changes.

**TRIAL COURSE OR NEW COURSE PROPOSAL**

**SUBMITTED BY:**

<b>Department</b>	<b>Mathematics and Statistics</b>	<b>College/School</b>	<b>CNSM</b>
<b>Prepared by</b>	<b>Latrice Bowman</b>	<b>Phone</b>	<b>474-5427</b>
<b>Email Contact</b>	<b><a href="mailto:lnbowman@alaska.edu">lnbowman@alaska.edu</a></b>	<b>Faculty Contact</b>	<b>Latrice Bowman</b>

<b>1. ACTION DESIRED</b> (CHECK ONE):	Trial Course	<input type="checkbox"/>	New Course	<input checked="" type="checkbox"/>
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<b>2. COURSE IDENTIFICATION:</b>	Dept	<b>MATH</b>	Course #	<b>110X</b>	No. of Credits	<b>4</b>
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Justify upper/lower division status & number of credits:	<p><b>Upper/Lower Division:</b> This course will combine the topics from two 100-level courses: Math 107 Functions for Calculus and Math 108 Trigonometry.</p> <p><b>Number of Credits:</b> The course will have 5 hours of classroom instruction per week over the course of a standard length semester (3 lecture hours and 2 recitation hours). This is similar to the current structure for MATH 200X.</p>
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<b>3. PROPOSED COURSE TITLE:</b>	<b>Precalculus</b>
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<b>4. To be CROSS LISTED?</b> YES/NO	<b>N</b>	If yes, Dept:	<input type="checkbox"/>	Course #	<input type="checkbox"/>
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NOTE: Cross-listing requires approval of both departments and deans involved. Add lines at end of form for additional required signatures.

<b>5. To be STACKED?</b> YES/NO	<b>N</b>	If yes, Dept.	<input type="checkbox"/>	Course #	<input type="checkbox"/>
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<b>How will the two course levels differ from each other? How will each be taught at the appropriate level?:</b>	
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Stacked course applications are reviewed by the (Undergraduate) Curricular Review Committee and by the Graduate Academic and Advising Committee. Creating two different syllabi—undergraduate and graduate versions—will help emphasize the different qualities of what are supposed to be two different courses. The committees will determine: 1) whether the two versions are sufficiently different (i.e. is there undergraduate and graduate level content being offered); 2) are undergraduates being overtaxed?; 3) are graduate students being undertaxed? In this context, the committees are looking out for the interests of the students taking the course. Typically, if either committee has qualms, they both do. More info online - see URL at top of this page.

<b>6. FREQUENCY OF OFFERING:</b>	<b>Every Fall, Spring, and Summer</b>
	Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) - or As Demand Warrants

<b>7. SEMESTER &amp; YEAR OF FIRST OFFERING</b> (AY2013-14 if approved by 3/1/2013; otherwise AY2014-15)	<b>Fall 2015</b>
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**8. COURSE FORMAT:**

NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council. Furthermore, **any core course compressed to less than six weeks must be approved by the Core Review Committee.**

<b>COURSE FORMAT:</b> (check all that apply)	<input type="checkbox"/>	1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input checked="" type="checkbox"/>	6 weeks to full semester
<b>OTHER FORMAT</b> (specify)												
<b>Mode of delivery</b> (specify lecture, field trips, labs, etc)	<b>Lecture with recitation times</b>											

<b>9. CONTACT HOURS PER WEEK:</b>	<input type="text" value="4"/>	LECTURE hours/weeks	<input type="text" value="1"/>	LAB hours /week	<input type="text" value=""/>	PRACTICUM hours /week
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Note: # of credits are based on contact hours. 800 minutes of lecture=1 credit. 2400 minutes of lab in a science course=1 credit. 1600 minutes in non-science lab=1 credit. 2400-4800 minutes of practicum=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/guidelines-for-computing-/> for more information on number of credits.

OTHER HOURS (specify type)	<input type="text"/>
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10. **COMPLETE CATALOG DESCRIPTION** including dept., number, title, credits, credit distribution, cross-listings and/or stacking (50 words or less if possible):

Example of a **complete** description:

FISH F487 W, O Fisheries Management  
 3 Credits Offered Spring  
 Theory and practice of fisheries management, with an emphasis on strategies utilized for the management of freshwater and marine fisheries. Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; ENGL F414; FISH F425; or permission of instructor. Cross-listed with NRM F487. (3+0)

**MATH F110X Precalculus**

4 Credits

Various classes of functions and their graphs are explored numerically, algebraically and graphically. Function classes include polynomial, rational, exponential, logarithmic and trigonometric. Skills and concepts needed for calculus (MATH 200X) are emphasized. This class is for students intending to take Calculus I. Note: Only seven credits total may be earned from MATH F107X, MATH F108, and MATH F110X. Prerequisite: placement into MATH 110X.  
 (4+1)

11. **COURSE CLASSIFICATIONS:** Undergraduate courses only. Consult with CLA Curriculum Council to apply S or H classification appropriately; otherwise leave fields blank.

H = Humanities	<input type="text"/>	S = Social Sciences	<input type="text"/>
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Will this course be used to fulfill a requirement for the baccalaureate core? If YES, attach form.	YES:	<input checked="" type="checkbox"/>	NO:	<input type="checkbox"/>
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IF YES, check which core requirements it could be used to fulfill:

O = Oral Intensive, Format 6	<input type="checkbox"/>	W = Writing Intensive, Format 7	<input type="checkbox"/>	X = Baccalaureate Core	<input checked="" type="checkbox"/>
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11.A Is course content related to northern, arctic or circumpolar studies? If yes, a "snowflake" symbol will be added in the printed Catalog, and flagged in Banner.

YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
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12. **COURSE REPEATABILITY:**

Is this course repeatable for credit?	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
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Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

<input type="text"/>
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How many times may the course be repeated for credit?	<input type="text"/>	TIMES
If the course can be repeated for credit, what is the maximum number of credit hours that may be earned for this course?	<input type="text"/>	CREDITS

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course?	<input type="text"/>	CREDITS
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13. **GRADING SYSTEM:** Specify only one. Note: Changing the grading system for a course later on constitutes a Major Course Change - Format 2 form.

LETTER:	<input checked="" type="checkbox"/>	PASS/FAIL:	<input type="checkbox"/>
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RESTRICTIONS ON ENROLLMENT (if any)

14. PREREQUISITES

Placement into MATH 110

These will be required before the student is allowed to enroll in the course.

15. SPECIAL RESTRICTIONS, CONDITIONS

16. PROPOSED COURSE FEES

\$25

Has a memo been submitted through your dean to the Provost for fee approval?

Yes

Yes/No

17. PREVIOUS HISTORY

Has the course been offered as special topics or trial course previously?

Yes

Yes/No

If yes, give semester, year, course #, etc.:

MATH 194 Spring 2014, Fall 2014, Spring 2015

18. ESTIMATED IMPACT

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

This course will be offered in place of one section of MATH 107X, a 4 credit math course. Thus, we have not changed the total number of credits DMS must teach each semester. However, in the long-run, we expect the course to reduce DMS teaching load by allowing appropriate students to take a single 4-credit course to prepare for MATH 200 Calculus I instead of two courses for a total of 7 credits. This course will require extensive use of a computer lab. As a result, enrollment in the course will be strictly limited to available resources.

19. LIBRARY COLLECTIONS

Have you contacted the library collection development officer (kljensen@alaska.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

No

Yes

N/A

20. IMPACTS ON PROGRAMS/DEPTS

What programs/departments will be affected by this proposed action? Include information on the Programs/Departments contacted (e.g., email, memo)

All programs that require Calculus I have the potential to be affected. Well-prepared students would have a shorter path to enrollment in Calculus I.

21. POSITIVE AND NEGATIVE IMPACTS

Please specify positive and negative impacts on other courses, programs and departments resulting from the proposed action.

Positive: Progressing through mathematics requirements is a major hurdle for many students. This course will offer a shorter path for those students who need to complete Calculus I, are close to being prepared to enroll in calculus, but still need to address some deficiencies in their mathematical background. As examples, a student who placed into Calculus I and had to withdraw due to poor prerequisite knowledge or a student who has completed courses in MATH 107x and MATH 108, but delayed enrollment in calculus would be targets of this course. Another issue this course addresses is delay between prerequisite completion and calculus enrollment. Under the present scheme, this lag is typically one year. Students in this course would be in a position to drop that to one semester. Finally, by narrowing the goal of the course explicitly to preparation for calculus, the topics and expectations can be more tightly tied to that goal.

Negative: None.

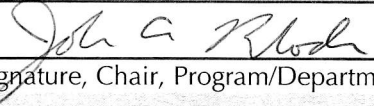
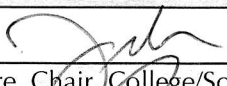
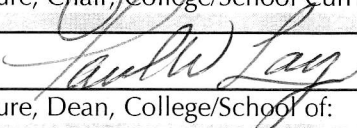
### **JUSTIFICATION FOR ACTION REQUESTED**

The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.

With the present curriculum offerings, a student who needs to take Calculus I and who is not prepared to take Calculus I will need to pass both MATH 107X Functions for Calculus (4.0 credits) and MATH 108 Trigonometry (3.0 credits) in order to satisfy the prerequisites for Calculus. Most students in this situation take these courses consecutively, not concurrently, which effectively delays enrollment in Calculus I by about a year. This path has the added disadvantage that the material on non-trigonometric functions is learned multiple semesters before it is applied in Calculus. Finally, over the years, MATH 107X has come to be used as a terminal core math course. A recent DMS study found that only 42% of students who pass MATH 107X even attempt Calculus I. This group constitutes a mere 27% of enrolled MATH 107X students. The proposed course has higher prerequisite requirements than MATH 107X, explicitly targets students who intend to take calculus, and is both individualized and mastery-based. The majority of outside-of-class work will be tailored to the student's particular weaknesses. So a student who shows mastery of polynomial functions and weakness in exponential functions will be able to reduce the work on one and work more extensively on the other. The course syllabus is constructed to encourage students to master all topics, not just 70% of them. The number of credit hours is designed similarly to MATH 200X where students will meet 5 days a week for 1 hour each day where 3 of these days are used for lecture and the other two days are used for recitation. The recitation usually consists of some short lectures with in class work done either individually or in small groups.

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**APPROVALS:** (Forms with missing signatures will be returned. Additional signature blocks may be added as necessary.)

	Date	9/29/14
Signature, Chair, Program/Department of: Mathematics + Statistics		
	Date	9-30-14
Signature, Chair, College/School Curriculum Council for: CNSM		
	Date	10/2/14
Signature, Dean, College/School of: CNSM		

Offerings above the level of approved programs must be approved in advance by the Provost (e.g., non-graduate level program offering of a 600-level course):

Signature of Provost (if applicable)	Date	
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**ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE.**

Signature, Chair	Date	
Faculty Senate Review Committee: <input type="checkbox"/> Curriculum Review <input type="checkbox"/> GAAC		
<input type="checkbox"/> Core Review <input type="checkbox"/> SADAC		

**ADDITIONAL SIGNATURES:** (As needed for cross-listing and/or stacking; add more blocks as necessary.)

Signature, Chair, Program/Department of:	Date	
Signature, Chair, College/School Curriculum Council for:	Date	
Signature, Dean, College/School of:	Date	

Note: If removing a cross-listing, you may attach copy of email or memo to indicate mutual agreement of this action by the affected department(s).

If degree programs are affected, a Format 5 program change form must also be submitted.

# MATH 110X Precalculus 4cr Spring 2015

*MWF 1-2pm Chapman 106 and TR 11:30am-12:30pm Chapman 103 Final Exam  
Friday May 8 10:15am-12:15pm*

*(Please note that this is the scheduled final time for Core Math finals)*

Instructor: Latrice Bowman Office: Chapman 301E Phone: 474-5427 email: [lnbowman@alaska.edu](mailto:lnbowman@alaska.edu)

Office Hours: MW 11:45am-12:45pm, T 1-2pm, or you are welcome to drop by.

Prerequisites: placement into MATH 110X.

Course Materials:

Text: Precalculus 6<sup>th</sup> edition by Stewart, Redlin, and Watson ISBN 9781133594765

This book can be purchased for \$145.50 or rented for \$65.49 at the UAF bookstore

ALEKS subscription: Your text should come with an ALEKS access code. You will need to set up an account the first day of class so if you do not have this code you will be able to purchase it online using a credit card.

Course description:

We will be studying various classes of functions and explore the numerical, algebraic and graphical aspects of them. Function classes include polynomial, rational, exponential, logarithmic, and trigonometric. Skills and concepts needed for Calculus are emphasized. This course is appropriate for students intending to take Calculus I, NOT for students trying ONLY to satisfy core requirements. Note: only seven credits may be earned from MATH 107x, MATH 108 and MATH 110X.

Course Goals:

We will cover background material needed to learn and understand Calculus. Students will study different classifications of functions and for each classification we will look at definitions, algebraic formulation, numerical properties and graphical characterizations. Students will recognize that the structure of this course emphasizes mastery of all course material.

Student Learning Outcomes:

- Identify and find all solutions to equations and inequalities
- Simplify expressions
- Graph functions and interpret graphs
- Understand the basic properties of functions
- Apply a variety of techniques to find solutions to equations
- Move between numerical, graphical and algebraic representations of functions
- Apply both the unit circle and triangle definitions to evaluate or graph trigonometric functions

Grades: Grades will be calculated based on the following:

Category	Percentage
ALEKS	10
Quizzes	15
Exam 1	15
Exam 2	15
Exam 3	15
Final (ALEKS and Paper)	30

Letter	Percentage
A	90-100
B	80-89
C	70-79
D	60-69
F	Below 60

#### Instructional Methods:

This is a hands-on mastery based course. This course meets five days a week for 1-hour each day.

Three days a week will be designated lecture/quiz days. These will consist of short overview lectures followed by 15-20 minute quizzes. These brief lectures are meant to supplement the textbook and the provided course materials. Students are required to have read through the material and be prepared for the class lecture. The quizzes will cover material that was previously covered in class or in previously assigned work. The quizzes are meant to test basic knowledge of concepts and basic applications of concepts. Twice a week will be designated 10-15 minute lectures and class work. Students will be required to attend these sessions and work on assignments, both in groups and individually.

The majority of the learning done in this course will be done independently. Students should expect to spend a minimum of 10 hours a week outside of class on assignments and studying.

#### Course Calendar (tentative):

- (week 1) A Review of the Fundamentals, Part I: real numbers, exponents and radicals, algebraic and rational expressions and equations. 1.1-1.5
- (week 2) A Review of the Fundamentals, Part II: modeling with equations, inequalities, coordinate geometry and graphing. 1.6-1.8, 1.10
- (week 3) Functions, Part I: definition, graphical implications, reading graphs, average rate of change. 2.1-2.4
- (week 4) Functions, Part II: transformations of functions, combinations of functions, one-to-one functions and inverses, 2.5-2.7
- (week 5) Polynomial Functions: quadratics, higher-order polynomials, division of polynomials, zeros of polynomials. 3.1-3.4
- (week 6) Rational Functions: definition and graphs of rational functions. 3.7; Review. Exam 1 on Chapters 1,2, and 3.
- (week 7) Exponential and Logarithmic Functions, Part I: definitions and basic properties of exponential and logarithmic functions. 4.1-4.4
- (week 8) Exponential and Logarithmic Functions, Part II: equations containing exponential and logarithmic expressions, modeling with exponential and logarithmic functions. 4.5-4.6
- (week 9) Unit Circle Definition of Trigonometric Functions: definitions, graphs, inverse trigonometric functions. 5.1-5.4
- (week 10) Review. Exam 2 on Chapters 4 and 5. A first look at the Right Triangle Approach to Trigonometric Functions. 6.1-6.2
- (week 11) More on the Right Triangle Approach: definitions, inverse functions, law of sines, law of cosines. 6.3-6.6
- (week 12) A Brief Look at Trigonometric Identities: Fundamental identities will be emphasized. 7.1; A quick look at other identities. 7.2-7.3. Trigonometric inequalities. 7.4
- (week 13) Systems of equations. 10.1; Review. Exam 3 over Chapter 6, 7, and 10.1.

- (week 14) Putting it all Together: a comprehensive look at all the families of functions covered in this course, cataloging and comparing both algebraic and graphical representations; a comprehensive look at trigonometric functions including both definitions, when to use which one, and identities; a comprehensive look at functions generally including defining properties and those of inverse functions. Practice Prerequisite Test for MATH 200X. Final Exam.

**Course Policies:**

**Attendance:** Attendance for this class is mandatory. Any student with more than five unexcused absences will be withdrawn for lack of participation. Students will not be exempt from work or given additional time on assignments whether an absence is excused or not.

**ALEKS:**

**Initial Assessment:** All students will take a proctored initial assessment in ALEKS. This assessment will usually take about 90 minutes and must be taken within the first two days of class.

**Objectives:** ALEKS objectives align with lecture topics and will be due weekly Saturday nights by 11:59pm. Student completion of ALEKS objectives will depend on the student’s initial assessment in ALEKS (students who mastered a topic in the initial assessment will have less work to complete that topic). All students are expected to master 100% of the topics in an objective by the weekly due date. Students will earn a score of 0-4 for completion of each ALEKS Objective as follows:

Percentage	Score
100	4
93-99	3
86-92	2
79-85	1
Below 79	0

**In Class Quizzes:** Quizzes will be given in class up to three times a week and will consist of 1 or 2 problems to be worked. Each quiz will be worth 10 points. No make-up quizzes will be allowed. Students will be allowed to drop their three lowest quizzes.

**Exams:** There will be 3 proctored hour long exams during the semester. All exams are written on paper, are closed book, closed notes, and no calculators. Exams will be given on the following dates and will cover the indicated material:

Exam	Topics	Date
1	Fundamentals and Functions	Friday, February 13
2	Polynomials, Exponentials and Logarithms	Friday, March 13
3	Trigonometry	Wednesday, April 29
Final Assessment	ALEKS Comprehensive	Thursday May 7
Final Exam	Comprehensive	Friday, May 8

Students will be given the opportunity to do an exam retake if they are not happy with their exam score. The retake will not be the same as the original exam however it will cover the same course material. The average of the two scores will be used in the overall grade calculation.

**Final and Final Assessment:** The final ALEKS objective will be a comprehensive assessment. This assessment will be proctored. Students will be allowed 1-hr to complete this assessment. The final exam will be a comprehensive 2-hour



exam and will be given at the UAF final exam time for this course. Students will be required to score at least 75% on the final exam and on the final assessment, else they will lose one letter grade from their overall grade.

#### Additional Support:

The UAF Math and Stat Lab: This free service can provide help on any problems within this course. For assistance you will need to go to Chapman 305. This is a drop in tutoring lab. You may go there to do homework or get specific questions answered. The lab will be open Monday-Friday 8am-10pm and Weekends 10am-6pm.

Online tutoring is another free service available to you through Blackboard. If you are not able to attend the Math and Stat Lab you will be able to receive help from qualified tutors using an online whiteboard.

SSS (Student Support Services) provides one-on-one tutoring to students who satisfy the requirements of the program. In addition to math tutoring SSS provides, advising, all core subject tutoring, laptop rentals and some other services.

The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. State that you will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodation to students with disabilities. Current letters for accommodations must be received by UAF e-learning staff and your instructor by January 31.

University and Department Policies: Your work in this course is governed by the UAF Honor code. The Department of Mathematics and Statistics has specific policies on incomplete grades, late withdrawals, and early final exams, some of which are listed below. A complete listing can be found at <http://www.dms.uaf.edu/dms/Policies.html>.

Late Withdrawal: This semester the last day for withdrawing with a W appearing on your transcript is March 13. If, in my opinion, a student is not participating adequately in the class, I may elect to drop or withdraw this student. Inadequate participation includes but is not limited to: missing an exam, repeatedly failing to take quizzes or to complete ALEKS objectives, or having a failing average (below 70%) at the withdrawal date.

Academic Honesty: Academic dishonesty, including cheating and plagiarism, will not be tolerated. It is a violation of the Student Code of Conduct and will be punished according to UAF procedures.

Courtesies: As a courtesy to your instructor and fellow students, please arrive to class on time, turn your cell phones and iPods off during class, and pay attention in class.