

General Education Review Committee Agenda

December 14, 2007
ADM 201
12:30 p.m. – 1:30 p.m.

I. Roll

() Erik Hirschman	Mat-Su/ UAB	Humanities/ Social Sciences
() Caedmon Liburd	UAB	
() Patricia Fagan	CAS	Humanities
() Bob Capuzzo	COE	
() Jack Pauli	CBPP/ UAB	
() Jeane Breinig	CAS	Written Communication
() Len Smiley	CAS/ UAB	Quantitative Skills
() Suzanne Forster	CAS/ UAB	
() Robin Wahto	CTC/ UAB	
() Walter Olivares	CAS	Fine Arts
() Tom Miller	OAA	Guest
() Gail Holtzman	CHSW/ UAB	Social Sciences
() Grant Baker	SOENGR/ UAB	
() Barbara Harville	CAS	Oral Communication
() vacant		Natural Science
() Karl Wing	USUAA	

II. Approval of Agenda (pg. 1)

III. Approval of Summary (pg. 2-3)

IV. Chair's Report

V. Course Action Requests

Chg LING A101 The Nature of Language (3 cr) (3+0)
No revisions received

Chg MATH A107 College Algebra (4 cr) (4+0) (pg. 4-8)

Chg MATH A108 Trigonometry (3 cr) (3+0) (pg. 9-12)

Chg MATH A109 Precalculus (6 cr) (6+0) (pg. 13-18)

Chg MATH A172 Applied Finite Mathematics (3 cr) (3+0) (pg. 19-22)

Chg MATH A200 Calculus I (4 cr) (4+0) (pg. 23-26)

Chg MATH A201 Calculus II (4 cr) (4+0) (pg. 27-30)

Chg MATH A272 Applied Calculus (3 cr) (3+0) (pg. 31-38)

VI. Old Business

VII. New Business

VIII. Informational Items and Adjournment

General Education Review Committee Summary

November 30, 2007

ADM 201

12:30 p.m. – 1:30 p.m.

I. Roll

(x) Erik Hirschman	Mat-Su/ UAB	Humanities/ Social Sciences
() Caedmon Liburd	UAB	
(x) Patricia Fagan	CAS	Humanities
(x) Bob Capuozzo	COE	
(x) Jack Pauli	CBPP/ UAB	
(x) Jeane Breinig	CAS	Written Communication
(x) Len Smiley	CAS/ UAB	Quantitative Skills
(x) Suzanne Forster	CAS/ UAB	
(x) Robin Wahto	CTC/ UAB	
() Walter Olivares	CAS	Fine Arts
(x) Tom Miller	OAA	Guest
(x) Gail Holtzman	CHSW/ UAB	Social Sciences
() Grant Baker	SOENGR/ UAB	
() Barbara Harville	CAS	Oral Communication
() vacant		Natural Science
() Karl Wing	USUAA	

II. Approval of Agenda (pg. 1-2)
Approved

III. Approval of Summary (pg. 3-4)
Under New Business “Approved as models approved” remove second approve
Approved w/ changes

IV. Chair’s Report

V. Course Action Requests

Chg LING A101 The Nature of Language (3 cr) (3+0)
Tabled- no revisions received

Chg CHEM A103 Survey of Chemistry (3 cr) (3+0) (pg.5-12)
Approved

Chg CHEM A103L Survey of Chemistry Laboratory (1 cr) (0+3) (pg. 13-19)
Approved

Chg CHEM A104 Introduction to Organic Chemistry and Biochemistry
(3 cr) (3+0) (pg. 20-26)
Approved

Chg CHEM A104L Introduction to Organic Chemistry and Biochemistry Laboratory
(1 cr) (0+3) (pg. 27-33)
Approved

Chg CHEM A105 General Chemistry I (3 cr) (3+0) (pg. 34-40)
Approved

Chg CHEM A105L General Chemistry I Laboratory (1 cr) (0+3) (pg. 41-47)
Approved

Chg CHEM A106 General Chemistry II (3 cr) (3+0) (pg. 48-54)
Approved

Chg CHEM A106L General Chemistry II Laboratory (1 cr) (0+3) (pg. 55-61)
Approved

Chg HNRS A192 Honors Seminar: Enduring Books (3 cr) (3+0) (pg. 62-70)
Concerns raised:

If there is available space, non-honors students could register. However, there are rarely any slots open for non-honors students. Administratively, this course and HNRS A292 are already being accepted as GER only if student completes the Honors Core. Approving them as GERs would eliminate paperwork involved in petitioning each course. If this change is accepted, this would be a restrictive GER course. Major concern is that we are creating a second level of GERs.

Chg HNRS A292 Honors Seminar in Social Science (3 cr) (3+0) (pg. 71-78)
Motion: Pass these two Honors course with the comment to UAB that much concern was expressed regarding the creation of a restrictive category of GERs.
For 6
Against 0
Approved

VI. Old Business

VII. New Business

VIII. Informational Items and Adjournment

Meeting Adjourned @1:50 pm

18. Mark if course has fees Math Lab Fee

19. Justification for Action

Minor change in course description. Update evaluation guidelines, texts and bibliography.

Initiator (faculty only)

Date

Initiator (PRINT NAME)

Approved

Disapproved:

Department Chairperson

Date

Approved

Disapproved:

Curriculum Committee Chairperson

Date

Approved

Disapproved:

Dean/Director of School/College

Date

Approved

Disapproved:

Undergraduate or Graduate
Academic Board Chairperson

Date

Approved

Disapproved:

Provost or Designee

Date

Course Content Guide
University of Alaska Anchorage
College of Arts and Sciences
Mathematical Sciences Department

Date: November 30, 2007

Course Information:

Course Subject/Number: Math A107

Credits and Contact Hours: 4.0 credits, 4+0 Contact Hours

Course Title: College Algebra

Grading Basis: A-F

Course Description: Covers equations and inequalities, function theory, solution of equations greater than second degree, determinants and matrices, systems of equations and inequalities, exponential and logarithmic function, graphs and equations of conic sections, including applications of all these topics; binomial theorem; sequences and series; mathematical induction and combinatoric notation.

Special Notes: A student may apply no more than 7 credits from any combination of MATH A107, A108 and A109 toward the graduation requirements for any baccalaureate degree.

Prerequisite: MATH A105 with minimum grade of C.

Registration Restrictions: If prerequisite is not satisfied, appropriate SAT or ACT scores or approved UAA Placement Test required.

Course Attributes: UAA GER Quantitative Skill Requirement.

Fees: Yes.

1. Instructional Goals and Student Outcomes

Instructional Goals. The Instructor will:

- Present proper notation, terminology and basic problem-solving methods
- Demonstrate the classification of various types of problems in algebra and the identification of which methods to apply to specific problems
- Present real-world applications using algebra

Student Outcomes. Students will be able to:

- Use proper notation, terminology and basic problem-solving methods
- Select the appropriate method of solution for problems in algebra
- Apply algebra to real-world problems

2. Guidelines for evaluation

Grading policy and procedures are at the discretion of the faculty member teaching the course. Assessment may be based on homework assignments, quizzes, tests and a midterm examination. A comprehensive final exam will be given. The grade in the course will be based on how well the student masters the course content.

3. Course Level Justification

The course is similar to standard College Algebra courses taught nationwide at the freshman level.

4. Course Outline

- 1.0 Basic Concepts. The student is expected to know the topics in this section prior to enrolling in MATH A107.
 - 1.1 Sets of Numbers and Their Properties
 - 1.2 Integer Exponents and Scientific Notation
 - 1.3 Rational Exponents and Radicals
 - 1.4 Polynomials
 - 1.5 Factoring Polynomials
 - 1.6 Algebraic Fractions

- 2.0 Equations and Inequalities
 - 2.1 Linear Equations and Modeling Applications
 - 2.2 Quadratic Equations and Modeling Applications
 - 2.3 Complex Numbers
 - 2.4 Polynomial and Radical Equations
 - 2.5 Inequalities and Absolute Value

- 3.0 Graphs of Equations
 - 3.1 The Rectangular Coordinate System
 - 3.2 The Slopes and Equations of Lines
 - 3.3 Graphs of Other Equations
 - 3.4 Proportion and Variation

- 4.0 Functions
 - 4.1 Functions and Function Notation
 - 4.2 Quadratic Functions
 - 4.3 Polynomial and Other Functions
 - 4.4 Translating and Stretching Graphs
 - 4.5 Rational Functions
 - 4.6 Operations on Functions
 - 4.7 Inverse Functions

- 5.0 Exponential and Logarithmic Functions
 - 5.1 Exponential Functions and Applications
 - 5.2 Base- e Exponential Functions and Applications
 - 5.3 Logarithmic Functions and Applications
 - 5.4 Properties of Logarithms
 - 5.5 Exponential and Logarithmic Equations

- 6.0 Polynomial Equations
 - 6.1 The Remainder and Factor Theorems
 - 6.2 Synthetic Division
 - 6.3 Descartes' Rules of Signs and Bounds on Roots
 - 6.4 Rational Roots of Polynomial Equations
 - 6.5 Irrational Roots of Polynomial Equations

- 7.0 Linear Systems
 - 7.1 Systems of Linear Equations
 - 7.2 Gaussian Elimination and Matrix Methods
 - 7.3 Matrix Algebra
 - 7.4 Matrix Inversion
 - 7.5 Solution of Systems of Equations using Determinants
 - 7.6 Partial Fractions
 - 7.7 Systems of Inequalities and Linear Programming

- 8.0 Conic Sections and Quadratic Systems
 - 8.1 The Circle
 - 8.2 The Parabola
 - 8.3 The Ellipse
 - 8.4 The Hyperbola
 - 8.5 Solving Simultaneous Second-Degree Equations

- 9.0 Natural Number Functions
 - 9.1 The Binomial Theorem and Combinatoric Notation
 - 9.2 Sequences, Series and the Summation Notation
 - 9.3 Arithmetic and Geometric Sequences and Applications
 - 9.4 Mathematical Induction

5. Suggested Texts

Cohen (2003): College Algebra, 5th edition. Brooks/Cole Cengage Learning.

Gustafson & Frisk (2007): College Algebra, 9th edition. Brooks/Cole Cengage Learning.

Sullivan (2008): College Algebra, 8th edition. Prentice Hall.

6. Bibliography

Beecher, Penna & Bittinger (2008): College Algebra, 3rd edition. Addison Wesley.

Dugopolski (2007): College Algebra, 4th edition. Addison Wesley.

Larson & Hostetler (2004): College Algebra, 6th edition. Houghton Mifflin.

Lial, Hornsby, Schneider (2005): College Algebra, 9th edition. Addison Wesley.



Curriculum Action Request

University of Alaska Anchorage

Proposal to Initiate, Add, Change, or Delete a Course or Program of Study

1a. School or College AS CAS		1b. Division AMSC Division of Math Science		1c. Department Mathematical Sciences	
2. Course Prefix MATH	3. Course Number A108	4. Previous Course Prefix & Number		5a. Credits/CEU 3	5b. Contact Hours (Lecture + Lab) (3+0)
6. Complete Course/Program Title Trigonometry <small>Abbreviated Title for Transcript (30 character)</small>					
7. Type of Course <input checked="" type="checkbox"/> Academic <input type="checkbox"/> Non-credit <input type="checkbox"/> CEU <input type="checkbox"/> Professional Development					
8. Type of Action <input checked="" type="checkbox"/> Course <input type="checkbox"/> Program			9. Repeat Status No # of Repeats Max Credits		
<input type="checkbox"/> Add <input type="checkbox"/> Prefix <input type="checkbox"/> Course Number <input checked="" type="checkbox"/> Change <input type="checkbox"/> Credits <input type="checkbox"/> Contact Hours <small>(mark appropriate boxes)</small> <input type="checkbox"/> Delete <input type="checkbox"/> Title <input type="checkbox"/> Repeat Status <input type="checkbox"/> Grading Basis <input type="checkbox"/> Cross-Listed/Stacked <input type="checkbox"/> Course Description <input type="checkbox"/> Course Prerequisites <input type="checkbox"/> Test Score Prerequisites <input type="checkbox"/> Co-requisites <input type="checkbox"/> Other Restrictions <input type="checkbox"/> Registration Restrictions <input type="checkbox"/> Class <input type="checkbox"/> Level <input type="checkbox"/> College <input type="checkbox"/> Major <input checked="" type="checkbox"/> Other CCG			10. Grading Basis <input checked="" type="checkbox"/> A-F <input type="checkbox"/> P/NP <input type="checkbox"/> NG		
			11. Implementation Date semester/year From: Fall/2008 To: /9999		
			12. <input type="checkbox"/> Cross Listed with _____ <input type="checkbox"/> Stacked with _____ Cross-Listed Coordination Signature		
13. List any programs or college requirements that require this course BLS, BA Elementary Education, AAS BS Construction Management, BS Technology, BS Technology Business Emphasis.					
14. Coordinate with Affected Units: Faculty list serve, CAS, CTC, COE, KPC, KO, Matsu, Kachemak Bay, Construction Management, Computer Science, Engineering, Engineering Science, Geomatics, Geology, Physics. Department, School, or College _____ Initiator Signature _____ Date _____					
15. <input checked="" type="checkbox"/> General Education Requirement <input type="checkbox"/> Oral Communication <input type="checkbox"/> Written Communication <input checked="" type="checkbox"/> Quantitative Skills <input type="checkbox"/> Humanities <input type="checkbox"/> Fine Arts <input type="checkbox"/> Social Sciences <input type="checkbox"/> Natural Sciences <input type="checkbox"/> Integrative Capstone					
16. Course Description Covers angular measure and trigonometric functions, fundamental trigonometric identities, composite angle identities, and graphs of trigonometric functions. Also includes complex numbers, De Moivre's theorem, solution of right and oblique triangles, solution of trigonometric equations, inverse trigonometric functions and vectors. Provides calculation practice helpful for physics, engineering and survey technology courses. Special Notes: A student may apply no more than 7 credits from any combination of Math A107, A108 and A109 toward the graduation requirements for any baccalaureate degree.					
17a. Course Prerequisite(s) (list prefix and number) Math A107 with minimum grade of C.		17b. Test Score(s)		17c. Co-requisite(s) (concurrent enrollment required)	
17d. Other Restriction(s) <input type="checkbox"/> College <input type="checkbox"/> Major <input type="checkbox"/> Class <input type="checkbox"/> Level		17e. Registration Restriction(s) (non-codable) If prerequisite is not satisfied, appropriate SAT or ACT scores or approved UAA Placement Test required.			
18. <input checked="" type="checkbox"/> Mark if course has fees Math Lab Fee					
19. Justification for Action Update evaluation guidelines, texts and bibliography.					

_____ Initiator (faculty only) Date	_____ Approved _____ Disapproved: _____ Dean/Director of School/College Date
_____ Initiator (PRINT NAME)	_____ Approved _____ Disapproved: _____ Undergraduate or Graduate Academic Board Chairperson Date
_____ Approved _____ Disapproved: _____ Department Chairperson Date	_____ Approved _____ Disapproved: _____ Provost or Designee Date
_____ Approved _____ Disapproved: _____ Curriculum Committee Chairperson Date	_____ Approved _____ Disapproved: _____ _____ Date

Course Content Guide
University of Alaska Anchorage
College of Arts and Sciences
Mathematical Sciences Department

Date: November 30, 2007

Course Information:

Course Subject/Number: MATH A108

Credits and Contact Hours: 3.0 credits, 3+0 Contact Hours

Course Title: Trigonometry

Grading Basis: A-F

Course Description: Covers angular measure and trigonometric functions, fundamental trigonometric identities, composite angle identities, and graphs of trigonometric functions. Also includes complex numbers, De Moivre's theorem, solution of right and oblique triangles, solution of trigonometric equations, inverse trigonometric functions and vectors. Provides calculation practice helpful for physics, engineering and survey technology courses.

Special Notes: A student may apply no more than 7 credits from any combination of Math A107, A108 and A109 toward the graduation requirements for any baccalaureate degree.

Prerequisites: Math A107 with minimum grade of C.

Registration Restrictions: If prerequisite is not satisfied, appropriate SAT or ACT scores or approved UAA Placement Test required.

Course Attributes: UAA GER Quantitative Skill Requirement.

Fees: Yes.

1. Instructional Goals and Student Outcomes

Instructional Goals. The instructor will:

- Prepare students for calculus courses involving trigonometric functions
- Prepare students for courses in other disciplines involving trigonometric functions
- Demonstrate the solution of applied problems involving both radian and degree calculations

Student Outcomes. Students will be able to:

- Perform trigonometric formula manipulations to simplify and solve equations
- State properties of the graphs of trigonometric functions
- Obtain numerical answers to a wide variety of measurement problems requiring trigonometry

2. Guidelines for evaluation

Grading policy and procedures are at the discretion of the faculty member teaching the course. Assessment may be based on homework assignments, quizzes, tests and a midterm examination. A comprehensive final exam will be given. The grade in the course will be based on how well the student masters the course content.

3. Course level justification

The course is similar to standard trigonometry courses taught nationwide at the freshman level.

4. Course Outline

1.0 Trigonometric Functions

- 1.1 The Unit Circle
- 1.2 Trigonometric Functions of Real Numbers
- 1.3 Trigonometric Graphs
- 1.4 Modeling Harmonic Motion

2.0 Trigonometric Functions of Angles

- 2.1 Angle Measure
- 2.2 Trigonometry of Right Angles
- 2.3 The Laws of Sines
- 2.4 The Law of Cosines

3.0 Analytic Trigonometry

- 3.1 Trigonometric Identities
- 3.2 Addition and Subtraction Formula
- 3.3 Double Angle, Half Angle, and Product-Sum Identities
- 3.4 Inverse Trigonometric Functions
- 3.5 Trigonometric Equations

4.0 Polar Coordinates, Complex Numbers and Vectors

- 4.1 Polar Coordinates
- 4.2 Graphs of Polar Equations
- 4.3 Complex Numbers and their Graphs
- 4.4 Polar Form of Complex Number
- 4.5 De Moivre's Theorem
- 4.6 Vectors and the dot product

5.0 Analytic Geometry

- 5.1 Rotation of Axes
- 5.2 Polar Equations of Conics

5.3 Parametric Equations

5. **Suggested Texts**

McKeague (2008): Trigonometry, 6th edition. Brooks/Cole Cengage Learning.

Stewart, Redlin & Watson (2003): Trigonometry, 1st edition. Brooks/Cole Cengage Learning.

Sullivan (2008): Trigonometry, 6th edition. Prentice Hall.

6. **Bibliography**

Dugopolski (2007): Trigonometry, 2nd edition. Addison Wesley.

Lial, Hornsby & Schneider (2005): Trigonometry, 8th edition. Addison Wesley.

Smith (1998): Trigonometry for College Students, 7th edition. Brooks/Cole Cengage Learning.

Course Content Guide
University of Alaska Anchorage
College of Arts and Sciences
Department of Mathematical Sciences

Date: November 30, 2007

Course Information:

Course Subject/Number: MATH A109

Credits and Contact Hours: 6.0 credits, 6+0 Contact Hours

Course Title: Precalculus

Grading Basis: A-F

Course Description: Intensive course covering polynomial, rational, exponential, logarithmic and trigonometric functions, composite and inverse functions, conic sections, matrices and determinants, solutions of equations and inequalities, vectors, complex numbers, DeMoivre's theorem, polar coordinates, parametric and polar graphs, sequences and series, binomial theorem, and mathematical induction.

Special Note: Intensive course designed for students who intend to take the calculus sequence (Math A200, A201, A202). A student may apply no more than 7 credits from any combination of MATH A107, A108 and A109 towards the graduation requirements for any baccalaureate degree.

Prerequisite: MATH A105 with minimum grade of B.

Registration Restrictions: If prerequisite is not satisfied, appropriate SAT or ACT scores or approved UAA Placement Test required.

Course Attributes: UAA GER Quantitative Skill Requirement.

Lab Fees: Yes.

1. Instructional Goals and Student Outcomes

Instructional Goals. The instructor will:

- Present proper notation, terminology and basic problem-solving methods
- Demonstrate the classification of various types of problems in algebra and trigonometry and the identification of which methods apply to specific problems
- Present real-world applications of algebra and trigonometry

Student Outcomes. Students will be able to:

- Use proper notation, terminology and basic problem-solving methods
- Select the appropriate method of solution for problems in algebra and trigonometry
- Apply algebra and trigonometry to real-world problems

2. Guidelines for evaluation

Grading policy and procedures are at the discretion of the faculty member teaching the course. Assessment may be based on homework assignments, quizzes, tests and a midterm examination. A comprehensive final exam will be given. The grade in the course will be based on how well the student masters the course content.

3. Course level justification

This course satisfies the Quantitative Skills category of the General Education Requirements at UAA. It is designed to complete the student's algebraic and trigonometric skills that are necessary for mathematical course work in calculus. This course is similar to standard precalculus courses taught nationwide at the freshman level.

4. Course Outline

1.0 Algebra background for precalculus

- 1.1 Sets of Real Numbers
- 1.2 Absolute Value
- 1.3 Polynomials and Factoring
- 1.4 Quadratic Equations

2.0 Coordinates, Graphs and Inequalities

- 2.1 Rectangular Coordinates
- 2.2 Graphs and Equations
- 2.3 Equations of Lines
- 2.4 Symmetry and Graphs
- 2.5 Inequalities

3.0 Functions

- 3.1 The Definition of a Function
- 3.2 The Graph of a Function
- 3.3 Techniques in Graphing
- 3.4 Methods of Combining Functions
- 3.5 Inverse Functions

4.0 Polynomial and Rational Functions. Applications to Optimization.

- 4.1 Linear Functions
- 4.2 Quadratic Function
- 4.3 Applied Problems
- 4.4 Maximum and Minimum Problems
- 4.5 Polynomial Functions
- 4.6 Rational Functions

5.0 Exponential and Logarithmic Functions

- 5.1 Exponential Functions
- 5.2 Natural Exponential Function $y=e^x$
- 5.3 Logarithmic Functions
- 5.4 Properties of Logarithms
- 5.5 Exponential and Logarithmic Equations
- 5.6 Applications including Compound Interest and Exponential Growth and Decay Problems

- 6.0 Trigonometric Functions of Angles
 - 6.1 Trigonometric Functions of Acute Angles
 - 6.2 Algebra and the Trigonometric Functions
 - 6.3 Right-Triangle Functions
 - 6.4 Trigonometric Functions of Angles
 - 6.5 Trigonometric Identities

- 7.0 Trigonometric Functions of Real Numbers
 - 7.1 Radian Measure and Geometry
 - 7.2 Trigonometric Functions of Real Numbers
 - 7.3 Graphs of the Sine and Cosine Functions
 - 7.4 Graphs of $y=A \sin (Bx-C)$ and $y=A \cos (Bx-C)$
 - 7.5 Graphs of the Tangent and Reciprocal Functions

- 8.0 Analytical trigonometry
 - 8.1 The Addition Formulas for Sine and Cosine
 - 8.2 The Double Angle Formulas
 - 8.3 The Product-To-Sum and Sum-To-Product Formulas
 - 8.4 Solution of Trigonometric Equations
 - 8.5 The Inverse Trigonometric Functions

- 9.0 Additional Topics in Trigonometry
 - 9.1 The Law of Sines and the Law of Cosines
 - 9.2 Vectors in the Plane: a Geometric Approach
 - 9.3 Vectors in the Plane: an Algebraic Approach
 - 9.4 Parametric Equations
 - 9.5 Introduction to Polar Coordinates
 - 9.6 Curves in Polar Coordinates

- 10.0 Systems of Equations
 - 10.1 Systems of Equations in Two Unknowns
 - 10.2 Gaussian Elimination
 - 10.3 Matrices
 - 10.4 The Inverse of a Square Matrix
 - 10.5 Determinants and Cramer's Rule
 - 10.6 Nonlinear Systems of Equations

- 10.7 Systems of Inequalities
- 11.0 Analytic Geometry
 - 11.1 The Basic Equations
 - 11.2 The Parabola
 - 11.3 The Ellipse
 - 11.4 The Hyperbola
 - 11.5 The Focus-Directrix Property of Conic Sections (optional)
 - 11.6 The Conic Sections in Polar Coordinates (optional)
 - 11.7 Rotation of Axes
- 12.0 Roots of Polynomial Equations
 - 12.1 The Complex Number System
 - 12.2 Division of Polynomials
 - 12.3 The Remainder Theorem and the Factor Theorem
 - 12.4 The Fundamental Theorem of Algebra
 - 12.5 Rational and Irrational Roots
 - 12.6 Conjugate Roots and Descartes's Rules of Signs
 - 12.7 Partial Fractions
- 13.0 Additional Topics in Algebra
 - 13.1 Mathematical Induction
 - 13.2 The Binomial Theorem
 - 13.3 Introduction to Sequences and Series
 - 13.4 Arithmetic Sequences and Series
 - 13.5 Geometric Sequences and Series
 - 13.6 De Moivre's Theorem

5. Suggested Texts

Cohen (2005): *Precalculus: A Problems Oriented Approach*, 6th edition. Brooks/Cole Cengage Learning.

Cohen (2006): *Precalculus with Unit Circle Trigonometry*. 4th edition. Brooks Cole Cengage Learning.

Dugopolski (2007): *Precalculus: Functions and Graphs*. 4th edition. Addison Wesley.

6. Bibliography

Beecher, Penna & Bittinger (2008): *Precalculus*, 3rd edition. Addison Wesley.

Blitzer (2007): *Precalculus*, 3rd edition. Prentice Hall.

Lial, Hornsby & Schneider (2005): *Precalculus*, 3rd edition. Addison Wesley.

Sullivan (2008): Precalculus, 8th edition. Prentice Hall.



Curriculum Action Request
 University of Alaska Anchorage
 Proposal to Initiate, Add, Change, or Delete a Course or Program of Study

1a. School or College AS CAS		1b. Division AMSC Division of Math Science		1c. Department Mathematical Sciences	
2. Course Prefix MATH	3. Course Number A172	4. Previous Course Prefix & Number		5a. Credits/CEU 3	5b. Contact Hours (Lecture + Lab) (3+0)
6. Complete Course/Program Title Applied Finite Mathematics <small>Abbreviated Title for Transcript (30 character)</small>					
7. Type of Course <input checked="" type="checkbox"/> Academic <input type="checkbox"/> Non-credit <input type="checkbox"/> CEU <input type="checkbox"/> Professional Development					
8. Type of Action <input checked="" type="checkbox"/> Course <input type="checkbox"/> Program			9. Repeat Status No # of Repeats Max Credits		
<input type="checkbox"/> Add <input type="checkbox"/> Prefix <input type="checkbox"/> Course Number <input checked="" type="checkbox"/> Change <input type="checkbox"/> Credits <input type="checkbox"/> Contact Hours <small>(mark appropriate boxes)</small> <input type="checkbox"/> Title <input type="checkbox"/> Repeat Status <input type="checkbox"/> Delete <input type="checkbox"/> Grading Basis <input type="checkbox"/> Cross-Listed/Stacked <input checked="" type="checkbox"/> Course Description <input type="checkbox"/> Course Prerequisites <input type="checkbox"/> Test Score Prerequisites <input type="checkbox"/> Co-requisites <input type="checkbox"/> Other Restrictions <input type="checkbox"/> Registration Restrictions <input type="checkbox"/> Class <input type="checkbox"/> Level <input type="checkbox"/> College <input type="checkbox"/> Major <input checked="" type="checkbox"/> Other CCG			10. Grading Basis <input checked="" type="checkbox"/> A-F <input type="checkbox"/> P/NP <input type="checkbox"/> NG		
			11. Implementation Date semester/year From: Fall/2008 To: /9999		
			12. <input type="checkbox"/> Cross Listed with _____ <input type="checkbox"/> Stacked with _____ Cross-Listed Coordination Signature		
13. List any programs or college requirements that require this course Bachelor of Liberal Studies, BBA Accounting, AAS Small Business Administration, Bachelor of Business Administration, AAS Computer Information Systems, BBA Management Information Systems, AAS Logistics, AAS Air Traffic Control, AAS Aviation Administration, AAS Computer Systems Technology.					
14. Coordinate with Affected Units: Faculty list serve, CAS, CBPP, CTC, KPC, KO, Matsu, Kachemak Bay, Business, Biological Sciences, Computer Information Systems, Complex Systems, Computer Science, Economics, Electrical Engineering. Department, School, or College _____ Initiator Signature Date					
15. <input checked="" type="checkbox"/> General Education Requirement <input type="checkbox"/> Oral Communication <input type="checkbox"/> Written Communication <input checked="" type="checkbox"/> Quantitative Skills <input type="checkbox"/> Humanities <input type="checkbox"/> Fine Arts <input type="checkbox"/> Social Sciences <input type="checkbox"/> Natural Sciences <input type="checkbox"/> Integrative Capstone					
16. Course Description Covers linear and quadratic equations and inequalities, algebra of matrices, introductory linear programming, exponential and logarithmic functions. Applications emphasizing the relationships of these mathematical concepts to quantitative decision making in the managerial and social sciences.					
17a. Course Prerequisite(s) (list prefix and number) Math A105 with minimum grade of C.		17b. Test Score(s)		17c. Co-requisite(s) (concurrent enrollment required)	
17d. Other Restriction(s) <input type="checkbox"/> College <input type="checkbox"/> Major <input type="checkbox"/> Class <input type="checkbox"/> Level		17e. Registration Restriction(s) (non-codable) If prerequisite is not satisfied, appropriate SAT or ACT scores or approved UAA Placement Test required.			
18. <input checked="" type="checkbox"/> Mark if course has fees Math Lab Fee					
19. Justification for Action Minor change in course description. Update evaluation guidelines, texts and bibliography.					

_____ Initiator (faculty only) Date	_____ Approved _____ Disapproved: _____ Dean/Director of School/College Date
_____ Initiator (PRINT NAME)	_____ Approved _____ Disapproved: _____ Undergraduate or Graduate Academic Board Chairperson Date
_____ Approved _____ Disapproved: _____ Department Chairperson Date	_____ Approved _____ Disapproved: _____ Provost or Designee Date
_____ Approved _____ Disapproved: _____ Curriculum Committee Chairperson Date	

Course Content Guide
University of Alaska Anchorage
College of Arts and Sciences
Mathematical Sciences Department

Date: November 30, 2007

Course Information:

Course Subject/Number: Math A172

Credits and Contact Hours: 3.0 credits, 3+0 Contact Hours

Course Title: Applied Finite Mathematics

Grading Basis: A-F

Course Description: Covers linear and quadratic equations and inequalities, algebra of matrices, introductory linear programming, exponential and logarithmic functions. Applications emphasizing the relationships of these mathematical concepts to quantitative decision making in the managerial and social sciences.

Prerequisite: Math A105 with minimum grade of C.

Registration Restrictions: If prerequisite is not satisfied, appropriate SAT or ACT scores or approved UAA Placement Test required.

Course Attributes: UAA GER Quantitative Skill Requirement.

Fees: Yes.

1. Instructional Goals and Student Outcomes

Instructional Goals. The instructor will:

- Introduce students to the concept of function, its notation, and graph, including algebraic, exponential and logarithmic functions
- Introduce students to matrices, elementary operations on matrices, and applications
- Introduce applications in management, life sciences and social sciences

Student Outcomes. Students will be able to:

- Use the concept of function, its notation, and graph
- Apply the rules of logarithms and exponents to evaluate logarithmic and exponential functions and to solve equations using these functions
- Solve systems of equations using elimination, substitution and matrix methods
- Translate a real-life problem into a mathematical model that can be solved using suitable algebra techniques

2. Course level justification

The course is similar in content to standard courses for managerial and social sciences students taught at the freshman level.

3. Course Evaluation

Grading policy and procedures are at the discretion of the faculty member teaching the course. Assessment may be based on homework assignments, quizzes, tests and a midterm examination. A comprehensive final exam will be given. The grade in the course will be based on how well the student masters the course content.

4. Course Outline

- 1.0 Algebraic Concepts
 - 1.1 Sets
 - 1.2 The Real Numbers
 - 1.3 Integer Exponents
 - 1.4 Radicals and Rational Exponents
 - 1.5 Operations with Algebraic Expressions
 - 1.6 Factoring
 - 1.7 Algebraic Fractions

- 2.0 Linear Equations and Functions
 - 2.1 Solutions of Linear Equations in One Variable
 - 2.2 Graphing Linear Equations
 - 2.3 Functions
 - 2.4 Special Functions and their Graphs
 - 2.5 Applications of Functions
 - 2.7 Solutions of Systems of Linear Equations
 - 2.8 Applications of Systems of Linear Equations

- 3.0 Non-Linear Models
 - 3.1 Quadratic Equations
 - 3.2 Quadratic Functions: Parabolas
 - 3.3 Business Applications of Quadratic Functions
 - 3.4 Special Functions and their Graphs

- 4.0 Linear Algebra
 - 4.1 Matrices
 - 4.2 Multiplication of Matrices
 - 4.3 Gauss-Jordan Elimination: Solving Systems of Equations
 - 4.4 Inverse of a Square Matrix
 - 4.5 Applications of Matrices

- 5.0 Inequalities and Linear Programming
 - 5.1 Linear Inequalities in One Variable
 - 5.2 Linear Inequalities in Two Variables
 - 5.3 Linear Programming: Graphical Methods

- 6.0 Exponential and Logarithmic Functions
 - 6.1 Exponential Functions
 - 6.2 Logarithmic Functions
 - 6.3 Solution of Exponential Equations
 - 6.4 Applications of Exponential and Logarithmic Functions

- 7.0 Applications in Management, Life and Social Sciences
 - 7.1 Arithmetic Sequences and Applications
 - 7.2 Geometric Sequences and Applications
 - 7.3 Annuities
 - 7.4 Loans and Amortization

5. Suggested Texts

Harshbarger & Reynolds (2007): *Mathematical Applications for the Management, Life & Social Sciences*, 8th edition. Houghton Mifflin.

Haeussler & Paul (2008): *Introductory Mathematical Analysis for Business, Economics, and the Life and Social Sciences*, 12th edition. Prentice Hall.

Tan (2008): *College Mathematics for the Managerial, Life and Social Sciences*, 7th edition. Brooks/Cole Cengage Learning.

6. Bibliography

Barnett, Ziegler & Byleen (2008): *College Mathematics for Business, Economics, Life Sciences, and Social Sciences*; 11th edition. Prentice Hall.

Lial & Hungerford (2007): *Mathematics with Applications*; 9th edition. Addison Wesley.

Waner & Costenoble (2008): *Finite Mathematics and Applied Calculus*, 4th edition. Brooks/Cole Cengage Learning.



Curriculum Action Request

University of Alaska Anchorage

Proposal to Initiate, Add, Change, or Delete a Course or Program of Study

1a. School or College AS CAS		1b. Division AMSC Division of Math Science		1c. Department Mathematical Sciences	
2. Course Prefix MATH	3. Course Number A200	4. Previous Course Prefix & Number		5a. Credits/CEU 4	5b. Contact Hours (Lecture + Lab) (4+0)
6. Complete Course/Program Title Calculus I <small>Abbreviated Title for Transcript (30 character)</small>					
7. Type of Course <input checked="" type="checkbox"/> Academic <input type="checkbox"/> Non-credit <input type="checkbox"/> CEU <input type="checkbox"/> Professional Development					
8. Type of Action <input checked="" type="checkbox"/> Course <input type="checkbox"/> Program			9. Repeat Status No # of Repeats Max Credits		
<input type="checkbox"/> Add <input type="checkbox"/> Prefix <input type="checkbox"/> Course Number <input checked="" type="checkbox"/> Change <input type="checkbox"/> Credits <input type="checkbox"/> Contact Hours <small>(mark appropriate boxes)</small> <input type="checkbox"/> Title <input type="checkbox"/> Repeat Status <input type="checkbox"/> Delete <input type="checkbox"/> Grading Basis <input type="checkbox"/> Cross-Listed/Stacked <input checked="" type="checkbox"/> Course Description <input type="checkbox"/> Course Prerequisites <input type="checkbox"/> Test Score Prerequisites <input type="checkbox"/> Co-requisites <input type="checkbox"/> Other Restrictions <input type="checkbox"/> Registration Restrictions <input type="checkbox"/> Class <input type="checkbox"/> Level <input type="checkbox"/> College <input type="checkbox"/> Major <input checked="" type="checkbox"/> Other CCG			10. Grading Basis <input checked="" type="checkbox"/> A-F <input type="checkbox"/> P/NP <input type="checkbox"/> NG		
			11. Implementation Date semester/year From: Fall/2008 To: /9999		
			12. <input type="checkbox"/> Cross Listed with _____ <input type="checkbox"/> Stacked with _____ Cross-Listed Coordination Signature		
13. List any programs or college requirements that require this course BS (CAS), BS Biological Sciences, BS Chemistry, BA & BS Computer Science, GS Geological Sciences, Bachelor of Liberal Studies, BA & BS Mathematics, BBA Accounting, BBA, BBA Management Information Systems, BA Economics, BA Elementary Education, BS Construction Management, BS Technology, BS Civil Engineering, Electrical Engineering, BS Engineering, AAS and BS Geomatics, Mechanical Engineering.					
14. Coordinate with Affected Units: Faculty list serve, CAS, CBPP, CTC, COE, SOE, KPC, KO, Matsu, Kachemak Bay, Chemistry, Economics, Electrical Engineering, Engineering, Engineering Science, Geomatics, Honors, Physics, Statistics. Department, School, or College _____ Initiator Signature Date					
15. <input checked="" type="checkbox"/> General Education Requirement <input type="checkbox"/> Oral Communication <input type="checkbox"/> Written Communication <input checked="" type="checkbox"/> Quantitative Skills <input type="checkbox"/> Humanities <input type="checkbox"/> Fine Arts <input type="checkbox"/> Social Sciences <input type="checkbox"/> Natural Sciences <input type="checkbox"/> Integrative Capstone					
16. Course Description A first course in calculus covering limits, including those with indeterminate form; and derivatives of algebraic and transcendental functions. Applications of derivatives including curve sketching, rates of change, and Newton's Method. Definite and indefinite integrals, including integration by substitution.					
17a. Course Prerequisite(s) (list prefix and number) [Math A107 with minimum grade of C and Math A108 with minimum grade of C] or [Math A109 with minimum grade of C].		17b. Test Score(s)		17c. Co-requisite(s) (concurrent enrollment required)	
17d. Other Restriction(s) <input type="checkbox"/> College <input type="checkbox"/> Major <input type="checkbox"/> Class <input type="checkbox"/> Level		17e. Registration Restriction(s) (non-codable) If prerequisite is not satisfied, appropriate SAT, ACT or AP scores or approved UAA Placement Test required.			
18. <input checked="" type="checkbox"/> Mark if course has fees Math Lab Fee					
19. Justification for Action Update course description and course content guide to reflect current content.					

Initiator (faculty only)	Date	_____ Approved	
Initiator (PRINT NAME)		_____ Disapproved:	Dean/Director of School/College Date
_____ Approved		_____ Disapproved:	Date
_____ Disapproved:	Department Chairperson Date	_____ Approved	Date
_____ Approved		_____ Disapproved:	Date
_____ Disapproved:	Curriculum Committee Chairperson Date	_____ Approved	Date
		_____ Disapproved:	Date
		_____ Approved	Date
		_____ Disapproved:	Date
		_____ Approved	Date
		_____ Disapproved:	Date
		_____ Approved	Date
		_____ Disapproved:	Date
		_____ Approved	Date
		_____ Disapproved:	Date

**Course Content Guide
University of Alaska Anchorage
College of Arts and Sciences
Mathematical Sciences Department**

Date: November 30, 2007

Course Information:

Course Subject/Number: MATH A200

Credits and Contact Hours: 4.0 credits, 4+0 Contact Hours

Course Title: Calculus I

Grading Basis: A-F

Course Description: A first course in calculus covering limits, including those with indeterminate form; and derivatives of algebraic and transcendental functions.

Applications of derivatives including curve sketching, rates of change, and Newton's Method. Definite and indefinite integrals, including integration by substitution.

Prerequisite: [Math A107 with minimum grade of C and Math A108 with minimum grade of C] or [Math A109 with minimum grade of C].

Registration Restrictions: If prerequisite is not satisfied, appropriate SAT, ACT or AP scores or approved UAA Placement Test required.

Course Attributes: UAA GER Quantitative Skill Requirement.

Fees: Yes.

1. Instructional Goals and Student Outcomes

Instructional Goals. The instructor will:

- Introduce students to the concept of limit, its notation and computation
- Present to students the concept of differentiation, its notation, calculation, and application
- Introduce students to the concept of integration, its notation and calculation

Student Outcomes. Students will be able to:

- Differentiate algebraic, exponential, logarithmic, trigonometric, hyperbolic, inverse trigonometric and inverse hyperbolic functions
- Evaluate elementary integrals using the substitution method
- Apply the concept of differentiation to sketch curves and to solve related rate and optimization problems

2. Guidelines for evaluation

Grading policy and procedures are at the discretion of the faculty member teaching the course. Assessment may be based on homework assignments, quizzes, tests and a midterm examination. A comprehensive final exam will be given. The grade in the course will be based on how well the student masters the course content.

3. Course level justification

The prerequisites for Math A200 are at the 100 level. Calculus I is taught nationwide at the lower division level.

4. Course Outline

1.0 Brief Review of Precalculus Concepts

- 1.1 Equations, Inequalities and Absolute Value
- 1.2 Points and Lines in the Plane
- 1.3 Functions and Combinations of Functions
- 1.4 Graphs and Aids to Graphing
- 1.5 Trigonometric Functions and Identities
- 1.6 Exponential and Logarithmic Functions

2.0 Limits, Continuity and Derivatives

- 2.1 The Limit of a Function
- 2.2 Calculating Limits using Limit Laws
- 2.3 The Definition of Limit
- 2.4 Continuity
- 2.5 Limits at Infinity; Horizontal Asymptotes
- 2.6 Tangents, Velocities and other Rates of Change
- 2.7 Definition of Derivative
- 2.8 The Derivative as a Function

3.0 Differentiation Rules

- 3.1 Derivatives of Polynomials and Exponential Functions
- 3.2 The Product and Quotient Rules
- 3.3 Derivatives of Trigonometric Functions
- 3.4 The Chain Rule
- 3.5 Implicit Differentiation
- 3.6 Higher Order Derivatives
- 3.7 Derivatives of Logarithmic Functions
- 3.8 Hyperbolic Functions
- 3.9 Related rates
- 3.10 Linear Approximations and Differentials

4.0 Applications of the Derivative

- 4.1 Maximum and Minimum Values
 - 4.2 The Mean Value Theorem
 - 4.3 The First and Second Derivative Tests
 - 4.4 How Derivatives Affect the Shape of a Curve
 - 4.5 Indeterminate Forms and L'Hospital's Rule
 - 4.6 Summary of Curve sketching
 - 4.7 Optimization Problems
 - 4.8 Newton's Method
- 5.0 The Integral
- 5.1 The Definite Integral
 - 5.2 The Fundamental Theorem of Calculus
 - 5.4 Indefinite Integrals and Integration Rules
 - 5.5 Integration by Substitution
 - 5.6 Logarithm Defined as an integral

5. Suggested Texts

Edwards & Penney (2008): Calculus: Early Transcendentals, 7th edition. Prentice Hall.

Larson, Hostetler & Edwards (2008). Calculus: Early Transcendental Functions. Houghton Mifflin.

Stewart (2008): Calculus: Early Transcendentals, 6th edition. Brooks/Cole. Cengage Learning.

6. Bibliography

Anton, Bivens & Davis (2005): Calculus: Early Transcendentals, 8th edition. Wiley.

Johnston & Mathews (2002): Calculus. Addison Wesley.

Salas, Etgen & Hille (2006): Calculus: One and Several Variables, 10th edition. Wiley.

Thomas, Weir, Hass & Giordano (2005): Thomas' Calculus, 11th edition. Addison Wesley.



Curriculum Action Request

University of Alaska Anchorage

Proposal to Initiate, Add, Change, or Delete a Course or Program of Study

1a. School or College AS CAS		1b. Division AMSC Division of Math Science		1c. Department Mathematical Sciences	
2. Course Prefix MATH	3. Course Number A201	4. Previous Course Prefix & Number		5a. Credits/CEU 4	5b. Contact Hours (Lecture + Lab) (4+0)
6. Complete Course/Program Title Calculus II <small>Abbreviated Title for Transcript (30 character)</small>					
7. Type of Course <input checked="" type="checkbox"/> Academic <input type="checkbox"/> Non-credit <input type="checkbox"/> CEU <input type="checkbox"/> Professional Development					
8. Type of Action <input checked="" type="checkbox"/> Course <input type="checkbox"/> Program			9. Repeat Status No # of Repeats Max Credits		
<input type="checkbox"/> Add <input type="checkbox"/> Prefix <input type="checkbox"/> Course Number <input checked="" type="checkbox"/> Change <input type="checkbox"/> Credits <input type="checkbox"/> Contact Hours <small>(mark appropriate boxes)</small> <input type="checkbox"/> Title <input type="checkbox"/> Repeat Status <input type="checkbox"/> Delete <input type="checkbox"/> Grading Basis <input type="checkbox"/> Cross-Listed/Stacked <input checked="" type="checkbox"/> Course Description <input type="checkbox"/> Course Prerequisites <input type="checkbox"/> Test Score Prerequisites <input type="checkbox"/> Co-requisites <input type="checkbox"/> Other Restrictions <input type="checkbox"/> Registration Restrictions <input type="checkbox"/> Class <input type="checkbox"/> Level <input type="checkbox"/> College <input type="checkbox"/> Major <input checked="" type="checkbox"/> Other CCG			10. Grading Basis <input checked="" type="checkbox"/> A-F <input type="checkbox"/> P/NP <input type="checkbox"/> NG		
			11. Implementation Date semester/year From: Fall/2008 To: /9999		
			12. <input type="checkbox"/> Cross Listed with _____ <input type="checkbox"/> Stacked with _____ Cross-Listed Coordination Signature		
13. List any programs or college requirements that require this course BS Biological Sciences, BS Chemistry, BS Computer Science, Bachelor of Liberal Studies, BA & BS Mathematics, BA Elementary Education, BS Civil Engineering, Electrical Engineering, BS Engineering, BS Geomatics, Mechanical Engineering.					
14. Coordinate with Affected Units: Faculty list serve, CAS, CTC, COE, SOE, KPC, KO, Matsu, Kachemak Bay, Electrical Engineering, Engineering Science, Physics. Department, School, or College _____ Initiator Signature _____ Date _____					
15. <input checked="" type="checkbox"/> General Education Requirement <input type="checkbox"/> Oral Communication <input type="checkbox"/> Written Communication <input checked="" type="checkbox"/> Quantitative Skills <input type="checkbox"/> Humanities <input type="checkbox"/> Fine Arts <input type="checkbox"/> Social Sciences <input type="checkbox"/> Natural Sciences <input type="checkbox"/> Integrative Capstone					
16. Course Description Covers integration techniques and applications; sequences and series, including convergence tests; curves in the plane and polar coordinates.					
17a. Course Prerequisite(s) (list prefix and number) Math A200 with minimum grade of C.		17b. Test Score(s)		17c. Co-requisite(s) (concurrent enrollment required)	
17d. Other Restriction(s) <input type="checkbox"/> College <input type="checkbox"/> Major <input type="checkbox"/> Class <input type="checkbox"/> Level			17e. Registration Restriction(s) (non-codable)		
18. <input checked="" type="checkbox"/> Mark if course has fees Math Lab Fee					
19. Justification for Action Update course description and course content guide to reflect current content.					

Initiator (faculty only) Date

Initiator (PRINT NAME)

Approved

Disapproved: _____
Department Chairperson Date

Approved

Disapproved: _____
Curriculum Committee Chairperson Date

Approved

Disapproved: _____
Dean/Director of School/College Date

Approved

Disapproved: _____
Undergraduate or Graduate
Academic Board Chairperson Date

Approved

Disapproved: _____
Provost or Designee 27 Date

Course Content Guide
University of Alaska Anchorage
College of Arts and Sciences
Department of Mathematical Sciences

Date: November 30, 2007

Course Information:

Course Subject/Number: MATH A201

Credits and Contact Hours: 4.0 credits, 4+0 Contact Hours

Course Title: Calculus II

Grading Basis: A-F

Course Description: Covers integration techniques and applications; sequences and series, including convergence tests; curves in the plane and polar coordinates.

Prerequisite: Math A200 with minimum grade of C.

Course Attributes: UAA GER Quantitative Skill Requirement.

Fees: Yes.

1. Instructional Goals and Student Outcomes

Instructional Goals. The instructor will:

- Present techniques of integration
- Introduce applications of integration
- Present sequences and series
- Present parametric equations and polar coordinates

Student Outcomes. Students will be able to:

- Evaluate a variety of integrals using standard integration techniques
- Solve applied problems using integration techniques
- Use the fundamental tests of convergence of infinite series and be able to manipulate sequences and series
- Parameterize curves and use polar coordinates

2. Guidelines for evaluation

Grading policy and procedures are at the discretion of the faculty member teaching the course. Assessment may be based on homework assignments, quizzes, tests and a midterm examination. A comprehensive final exam will be given. The grade in the course will be based on how well the student masters the course content.

3. Course level justification

The calculus sequence is taught nationwide at the lower division level.

4. Course Outline

- 1.0 Techniques of Integration
 - 1.1 Integration by Parts
 - 1.2 Trigonometric Integrals
 - 1.3 Trigonometric Substitutions
 - 1.4 Integration of Rational Functions using Partial Fractions
 - 1.5 Integration using Tables and Computer Algebra Systems (optional)
 - 1.6 Trapezoidal and Simpson's Rule
 - 1.7 Improper Integrals

- 2.0 Applications of Integration
 - 2.1 Areas Between Curves
 - 2.2 Volumes
 - 2.3 Volumes of Revolution
 - 2.4 Arc Length
 - 2.5 Work Problems
 - 2.6 Separable Differential Equations

- 3.0 Sequences and Series
 - 3.1 Sequences
 - 3.2 Series
 - 3.3 Integral Test
 - 3.4 The Comparison Tests
 - 3.5 Alternating Series
 - 3.6 Absolute Convergence and the Ratio and Root Tests
 - 3.7 Power series
 - 3.8 Taylor and Maclaurin Series
 - 3.9 Binomial series
 - 3.10 Applications of Taylor Polynomials

- 4.0 Parametric Equations and Polar Coordinates
 - 4.1 Parametric Curves
 - 4.2 Length and Surface Area for Parameterized Curves
 - 4.3 Polar Coordinates
 - 4.4 Length and Area in Polar Coordinates
 - 4.5 Conic Sections

5. Suggested Texts

Edwards & Penney (2008): Calculus: Early Transcendentals, 7th edition. Prentice Hall.

Larson, Hostetler & Edwards (2008). Calculus: Early Transcendental Functions. Houghton Mifflin.

Stewart (2008): Calculus: Early Transcendentals, 6th edition. Brooks/Cole
Cengage Learning.

6. Bibliography

Anton, Bivens & Davis (2005): Calculus: Early Transcendentals, 8th edition.
Wiley.

Johnston & Mathews (2002): Calculus. Addison Wesley.

Salas, Etgen & Hille (2006): Calculus: One and Several Variables, 10th edition.
Wiley.

Thomas, Weir, Hass & Giordano (2005): Thomas' Calculus, 11th edition. Addison
Wesley.



Curriculum Action Request

University of Alaska Anchorage

Proposal to Initiate, Add, Change, or Delete a Course or Program of Study

1a. School or College AS CAS		1b. Division AMSC Division of Math Science		1c. Department Mathematical Sciences	
2. Course Prefix MATH	3. Course Number A272	4. Previous Course Prefix & Number		5a. Credits/CEU 3	5b. Contact Hours (Lecture + Lab) (3+0)
6. Complete Course/Program Title Applied Calculus <small>Abbreviated Title for Transcript (30 character)</small>					
7. Type of Course <input checked="" type="checkbox"/> Academic <input type="checkbox"/> Non-credit <input type="checkbox"/> CEU <input type="checkbox"/> Professional Development					
8. Type of Action <input checked="" type="checkbox"/> Course <input type="checkbox"/> Program			9. Repeat Status No # of Repeats Max Credits		
<input type="checkbox"/> Add <input type="checkbox"/> Prefix <input type="checkbox"/> Course Number <input checked="" type="checkbox"/> Change <input type="checkbox"/> Credits <input type="checkbox"/> Contact Hours <small>(mark appropriate boxes)</small> <input type="checkbox"/> Title <input type="checkbox"/> Repeat Status <input type="checkbox"/> Delete <input type="checkbox"/> Grading Basis <input type="checkbox"/> Cross-Listed/Stacked <input checked="" type="checkbox"/> Course Description <input checked="" type="checkbox"/> Course Prerequisites <input type="checkbox"/> Test Score Prerequisites <input type="checkbox"/> Co-requisites <input type="checkbox"/> Other Restrictions <input type="checkbox"/> Registration Restrictions <input type="checkbox"/> Class <input type="checkbox"/> Level <input type="checkbox"/> College <input type="checkbox"/> Major <input checked="" type="checkbox"/> Other CCG			10. Grading Basis <input checked="" type="checkbox"/> A-F <input type="checkbox"/> P/NP <input type="checkbox"/> NG		
			11. Implementation Date semester/year From: Fall/2008 To: /9999		
			12. <input type="checkbox"/> Cross Listed with _____ <input type="checkbox"/> Stacked with _____ Cross-Listed Coordination Signature		
13. List any programs or college requirements that require this course BS (CAS), BA Computer Science, Bachelor of Liberal Studies, BBA Accounting, BBA, BBA Management Information Systems, BA Economics, AAS Air Traffic Control, AAS Aviation Administration, BS Aviation Technology, BS Construction Management, BS Technology.					
14. Coordinate with Affected Units: Faculty list serve, CAS, CBPP, CTC, KPC, KO, Matsu, Kachemak Bay, Aviation, Business, Computer Science, Economics, Honors, Statistics. Department, School, or College _____ Initiator Signature _____ Date _____					
15. <input checked="" type="checkbox"/> General Education Requirement <input type="checkbox"/> Oral Communication <input type="checkbox"/> Written Communication <input checked="" type="checkbox"/> Quantitative Skills <input type="checkbox"/> Humanities <input type="checkbox"/> Fine Arts <input type="checkbox"/> Social Sciences <input type="checkbox"/> Natural Sciences <input type="checkbox"/> Integrative Capstone					
16. Course Description Covers functions and graphs, differentiation, exponential and logarithmic functions, antidifferentiation and integration, functions of several variables. Applications of these mathematical concepts.					
17a. Course Prerequisite(s) (list prefix and number) MATH A107 with minimum grade of C or MATH A172 with minimum grade of C.		17b. Test Score(s)		17c. Co-requisite(s) (concurrent enrollment required)	
17d. Other Restriction(s) <input type="checkbox"/> College <input type="checkbox"/> Major <input type="checkbox"/> Class <input type="checkbox"/> Level		17e. Registration Restriction(s) (non-codable)			
18. <input checked="" type="checkbox"/> Mark if course has fees Math Lab Fee					
19. Justification for Action Modify prerequisites for consistency with other GER Quantitative Skills courses. Update evaluation guidelines, texts and bibliography.					

Initiator (faculty only) Date

Initiator (PRINT NAME)

____ Approved
____ Disapproved: _____
Department Chairperson Date

____ Approved
____ Disapproved: _____
Curriculum Committee Chairperson Date

____ Approved
____ Disapproved: _____
Dean/Director of School/College Date

____ Approved
____ Disapproved: _____
Undergraduate or Graduate
Academic Board Chairperson Date

____ Approved
____ Disapproved: _____
Provost or Designee Date

Course Content Guide
University of Alaska Anchorage
College of Arts and Sciences
Mathematical Sciences Department

Date: November 30, 2007

Course Information:

Course Subject/Number: MATH A272

Credits and Contact Hours: 3.0 Credits, 3+0 Contact Hours

Course Title: Applied Calculus

Grading Basis: A-F

Course Description: Covers functions and graphs, differentiation, exponential and logarithmic functions, antidifferentiation and integration, functions of several variables. Applications of these mathematical concepts.

Prerequisites: MATH A107 with minimum grade of C or MATH A172 with minimum grade of C.

Course Attributes: UAA GER Quantitative Skill Requirement.

Lab Fees: Yes.

1. Instructional Goals and Student Outcomes

Instructional Goals. The instructor will:

- Introduce techniques and rules of differentiation and integration
- Present applications of differentiation and integration
- Introduce partial derivatives and appropriate applications

Student Outcomes. Students will be able to:

- Differentiate functions involving rational, exponential and logarithmic functions and combinations of these functions
- Integrate functions using the power rule (substitution method) and integration by parts techniques
- Use differentiation and integration techniques to solve applied problems

2. Course level justification

The course has a prerequisite of college algebra taught at the freshman level. The course is similar to standard calculus courses for business and life sciences students taught at the sophomore level.

3. Course Evaluation

Grading policy and procedures are at the discretion of the faculty member teaching the course. Assessment may be based on homework assignments, quizzes, tests and a midterm examination. A comprehensive final exam will be given. The grade in the course will be based on how well the student masters the course content.

4. Course Outline

- 1.0 Introduction to Differentiation
 - 1.1 Limits
 - 1.2 Continuous Functions
 - 1.3 The Derivative: Rates of Change; Tangent to a Curve
 - 1.4 Derivative Formulas
 - 1.5 Product and Quotient Rules
 - 1.6 The Chain Rule and the Power Rule
 - 1.7 Higher-Order Derivatives
 - 1.8 Applications of Derivatives in Business and Economics
- 2.0 Applications of Derivatives
 - 2.1 Relative Maxima and Minima; Curve Sketching
 - 2.2 Concavity; Points of Inflection
 - 2.3 Optimization Problems in Business, Economics and the Social Sciences
 - 2.4 Limits at Infinity and Asymptotes; More Curve Sketching
- 3.0 Derivatives of Exponential and Logarithmic Functions
 - 3.1 Derivatives of Exponential Functions
 - 3.2 Derivatives of Logarithmic Functions
 - 3.3 Implicit Differentiation
 - 3.3 Related Rates
 - 3.4 Applications in Business and Economics
- 4.0 Indefinite Integrals
 - 4.1 The Indefinite Integral
 - 4.2 The Power Rule
 - 4.3 Integrals involving Logarithmic and Exponential Functions
 - 4.4 Applications in Business and Economics
 - 4.5 Differential Equations and Applications
- 5.0 Definite Integrals
 - 5.1 Area under a Curve
 - 5.2 The Fundamental Theorem of Calculus
 - 5.3 Area Between Curves
 - 5.4 Applications in Business and Economics
 - 5.5 Using Integral Tables
 - 5.6 Integration by Parts
 - 5.7 Improper Integrals and their Applications

- 6.0 Functions of Several Variables
 - 6.1 Functions and Domains
 - 6.2 Partial Derivatives
 - 6.3 Applications of Partial Derivatives
 - 6.4 Higher Order Partial Derivatives
 - 6.5 Maxima and Minima
 - 6.6 Lagrange Multipliers (Optional)

5. Suggested Texts

Goldstein, Schneider, Lay & Asmar (2007): Brief Calculus and Its Applications, 11th edition. Prentice Hall.

Harshbarger & Reynolds (2007): Mathematical Applications for the Management, Life & Social Sciences, 8th edition. Houghton Mifflin.

Tan (2008): Calculus for the Management, Life, and Social Sciences. 7th edition. Brooks/Cole Cengage Learning.

6. Bibliography

Barnett, Ziegler & Byleen (2008): Calculus for Business, Economics, Life Sciences, and Social Sciences, 11th edition. Prentice Hall.

Haeussler & Paul (2008): Introductory Mathematical Analysis, 12th edition. Prentice Hall.

Tan (2008): College Mathematics for the Managerial, Life and Social Sciences, 7th edition. Brooks/Cole Cengage Learning.

Waner & Costenoble (2008): Applied Calculus, 4th edition. Brooks/Cole Cengage Learning.

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	BA Elementary Education	142
	AAS Construction Management	184
	BS Construction Management	185
	BS Technology	211
	ENGR A151 - Prerequisite	372
	ENGR A161 - Prerequisite	372
	GEOL A335 - Prerequisite	382
	STAT A253 - Prerequisite	456
	TECH A433 - Prerequisite	461
	TECH A443 - Prerequisite	461
MATH A172	Bachelor of Liberal Studies	111
	BBA Accounting	128
	AAS Small Business Administration	130
	BBA Economics, Finance, Management, Global Logistics, Marketing	131
	AAS Computer Information System	133
	BBA Management Information Systems	134
	AAS Logistics	137
	AAS Air Traffic Control	170
	AAS Aviation Administration	171
	AAS Computer Systems Technology	183
	BA A273 - Prerequisite	314
	BIOL A200 - Prerequisite	318
	CIS A185 - Prerequisite	334
	CPLX A200 - Prerequisite	339
	CS A241-Prerequisite	340
	ECON A201 - Prerequisite	350
	EE A241 - Prerequisite	367
MATH A200	Bachelor of Science (CAS)	85
	Bachelor of Science Biological Sciences	94
	Bachelor of Science Chemistry, Chemistry Option	96
	Bachelor of Science Chemistry, Biochemistry Option	97
	Bachelor of Arts Computer Science	98
	Bachelor of Science Computer Science	98
	Bachelor of Science Geological Sciences	103
	Bachelor of Liberal Studies	111
	Bachelor of Arts Mathematics	112
	Bachelor of Science Mathematics	112
	Minor in Mathematics	113
	Minor in Statistics	124
	BBA Accounting	127
	BBA Economics, Finance, Management, Global Logistics Management, Marketing	131
	BBA Management Information Systems	134
	BA Economics	135
	BA Elementary Education	142
	Bachelor of Science Construction Management	185

	Bachelor of Science Technology	211
	Bachelor of Science Technology - Business Emphasis	211
	Bachelor of Science Civil Engineering	219
	Electrical Engineering	220
	Bachelor of Science Engineering	222
	AAS Geomatics	225
	BS Geomatics	225
	Mechanical Engineering	226
	CHEM A311 - Prerequisite	329
	ECON A321 - Prerequisite	350
	EE A102 - Prerequisite	367
	EE A203 - Prerequisite	367
	ENGR A251 - Prerequisite	372
	ES A111 - Registration Restriction	373
	ES A201 - Prerequisite	373
	GEO A256 - Prerequisite	380
	GEO A359 - Prerequisite	380
	GEO A456 - Prerequisite	380
	GEO A466 - Prerequisite	381
	HNRS A309 - Prerequisite	390
	PHYS A211 - Prerequisite	438
	STAT A307 - Prerequisite	456
MATH A201	BS Biological Sciences	94
	BS Chemistry - Chemistry Option	96
	BS Chemistry - Biochemistry Option	97
	BS Computer Science	98
	BS Liberal Studies	111
	BA Mathematics	112
	BS Mathematics	112
	Minor in Mathematics	113
	Minor in Statistics	124
	BA Elementary Education	142
	BS Civil Engineering	219
	Electrical Engineering	220
	BS Engineering	222
	BS Geomatics	225
	Mechanical Engineering	226
	EE A203 - Prerequisite	367
	EE A204 - Prerequisite	367
	ES A208 - Prerequisite	373
	ES A209 - Prerequisite	373
	ES A302 - Prerequisite	373
	ES A341 - Prerequisite	374
	ES A346 - Prerequisite	374
	PHYS A211 - Prerequisite	438
	PHYS A212 - Prerequisite	438
MATH A272	BS CAS	85
	BA Computer Science	98
	Bachelor of Liberal Studies	111
	BBA Accounting	127
	BBA Economics, Finance, Management, Global Logistics Management, Marketing	131
	BBA Management Information Systems	134

BA Economics	135
AAS Air Traffic Control	170
AAS Aviation Administration	171
BS Aviation Technology	174
BS Construction Management	185
BS Technology	211
BS Technology, Business Emphasis	211
AT A340 - Prerequisite	312
BA A375 - Prerequisite	314
BA A377 - Prerequisite	314
CS A201 - Prerequisite	340
ECON A321, Prerequisite	350
HNRS A309 - Prerequisite	350
STAT A307 - Prerequisite	456