2008-2009

KANSAS CORE OUTCOMES PROJECT

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BACKGROUND

The Kansas Core Outcomes Project was initiated in 1999 by the Kansas Council of Instructional Administrators (KCIA), a group comprised of the chief academic officers of the state's community colleges and vocational-technical schools/colleges. The goal of this project was to develop core outcomes and competencies for general education courses at the state's colleges and universities.

The first meeting for the project was held in fall 1999 at the Southside Educational Center in Wichita. Faculty were invited to that meeting from the state's 19 public community colleges, six Regents' universities, and Washburn University. Six disciplines were represented: Biology, Computer Science, English, Mathematics, Sociology, and Speech. A second meeting, in spring 2000, was conducted at Emporia State University, and three additional disciplines—Chemistry, History, and Psychology—were added to that initial group of six. A third meeting, again at Southside, was conducted in January 2001. Another meeting of the core competency groups was held in September of 2002. Subsequently, disciplines such as English, Mathematics, and Speech have scheduled other, independent meetings.

The Core Competency meetings were originally financed through the KCIA budget. Each institution made a commitment to its faculty and supplied them with finances for lunch and travel. Due to increased budget decreases and the time commitment for our faculty, it was decided that future meetings would be held annually in the fall semester. In 2005 and 2006, additional Core Competency meetings occurred, and reports have been filed with the Kansas Board of Regents.

At its retreat in the summer of 2007, the KCIA members decided that the project needed a comprehensive list of courses that have been evaluated in each area, a standard format for reporting of the reviews and outcomes, as well as minutes. Therefore, this report follows a standard format for each discipline even though some information, such as course titles, may be missing. Dr. Roxanne Kelly agreed to see that these would be posted on the KBOR website so that faculty would have easy access to the information.

All disciplines were invited to participate in the September 14, 2007, meeting held at the Hughes Metropolitan Complex, and they were asked to submit their work on a standard template that could be forwarded to the Kansas Board of Regents. This meeting involved the following disciplines: Anthropology, Chemistry, Computer Science, English, Math, Psychology, and Philosophy. Although Biology, Speech, and Theatre did not meet, they submitted their previous decisions and work in the standard format as requested. This was the first meeting for the Philosophy group.

All disciplines were again invited to participate in the September 12, 2008, Core Outcomes meeting at the Hughes Metropolitan Complex in Wichita. Those disciplines that met were the following: Anthropology, Biology, English, History, Math, Psychology, and Theatre. Updates for these disciplines will be found in the report along with all other disciplines. This is a cumulative report.

Contact: Martha.Shawver@wichita.edu or Gary.Miller@wichita.edu

Core Outcomes

Institutional abbreviations in the following section:

CC = Community College
TC = Technical College
TS = Technical School
U = University

Discipline: Mathematics

General Course Title: Beginnning/Elementary Algebra

Date Developed (and any modification): Unknown

Courses from Each Participating College/University for which Core Outcomes Apply:

Course title	Course Number	Credit Hours	Institutions
Beginning Algebra	MAT 015	3	Allen County CC
Basic Algebra	MATH 1821	3	Barton County CC
Fundamentals of Algebra	MA 060	3	Butler CC
Elementary Algebra	MA 099	3	Cloud County CC
n/a	n/a	n/a	Coffeyville CC
Beginning Algebra	MA 076	3	Colby CC
Elementary Algebra	EBM 4405	3	Cowley County CC
Elementary Algebra	MATH 090	3	Dodge City CC
Beginning Algebra	MA 095	3	Emporia State U
n/a	n/a	n/a	Fort Hays State U
Elementary Algebra	MAT 0953	3	Fort Scott CC
Beginning Algebra	MATH 006	3	Garden City CC
Beginning Algebra	MAT 100	3	Highland CC
Basic Algebra	MA 098	3	Hutchinson CC
n/a	n/a	n/a	Independence CC
Introduction to Algebra	MATH 115		Johnson County CC
Elementary Algebra	MATH 099	3	Kansas City Kansas CC
Beginning Algebra	MA 1717	3	Labette CC
Beginning Algebra	MATH 011	3	Neosho County CC
Elementary Algebra	MATH 017	3	Pittsburg State U
Beginning Algebra	MTH 076	3	Pratt CC
n/a	n/a	n/a	Kansas State U
Beginning Algebra	MA 0043	3	Seward County CC
n/a	n/a	n/a	U Kansas
Basic Algebra	MA 103	3	Washburn U
Beginning Algebra	MATH 011	5	Wichita State U

Comments:

Core Outcomes:

Students will be expected to use appropriate technology as one tool to achieve the following outcomes:

Arithmetic and Algebraic Manipulation

- Evaluate arithmetic expressions, including absolute value, using the order of operations and properties of real numbers.
- Evaluate algebraic expressions.
- Apply the laws of exponents to simplify expressions containing integer exponents.
- Express numbers in scientific notation.
- Perform addition, subtraction, multiplication, and division on polynomial expressions.
- Factor expressions with common factors, expressions that require grouping, trinomial expressions, and differences of squares.
- Perform addition, subtraction, multiplication, and division on rational expressions.
- Evaluate radicals, approximating those that are irrational.
- Simplify numeric radicals using the product and quotient rules.

Equations and Inequalities

- Solve linear equations in one variable.
- Solve proportional equations.
- Solve linear inequalities in one variable, showing solutions on the real number line.
- Solve literal equations that do not require factoring.
- Solve quadratic equations by factoring.
- Develop and solve mathematical models including number, geometry, and percentage applications.

Graphs on a Coordinate Plane

- Plot points correctly on a coordinate plane.
- Graph linear equations by plotting points.
- Graph linear equations by using intercepts.
- Graph linear equations using the y-intercept and slope.

Analysis of Equations and Graphs

- Identify the x-intercept, y-intercept, and slope of a line, given its graph.
- Identify the x-intercept, y-intercept, and slope of a line, given its equation.
- Determine the equation of a line, given its graph, its slope and y-intercept, or its slope and a point on the line.
- Determine equations of both horizontal and vertical lines.
- Determine whether or not an equation is linear.
- Calculate the slope of a line passing through two given points.

Comments:

Participants:

This information is not available.

Discipline: Mathematics

General Course Title: College Algebra

Date Developed (and any modification): Unknown; revised 9/2004

Courses from Each Participating College/University for which Core Outcomes Apply:

Course Title	Course Number	Credit Hours	Institution
College Algebra	MAT 105	3	Allen County CC
College Algebra	MATH 1828	3	Barton County CC
College Algebra	MA 135	3	Butler CC
College Algebra	MA 111	3	Cloud County CC
College Algebra	MATH 105	3	Coffeyville CC
College Algebra	MA 178	3	Colby CC
College Algebra	MTH 4420	3	Cowley County CC
College Algebra	MATH 106	3	Dodge City CC
College Algebra	MA 110	3	Emporia State U
College Algebra	MA 110	3	Fort Hays State U
College Algebra	MAT 1083	3	Fort Scott CC
College Algebra	MATH 108	3	Garden City CC
College Algebra	MAT 104	3	Highland CC
College Algebra	MA 106	3	Hutchinson CC
College Algebra	MAT 1023	3	Independence CC
College Algebra	MATH 171	3	Johnson County CC
College Algebra	MATH 105	3	Kansas City Kansas CC
College Algebra	MA 1717	3	Labette CC
College Algebra	MATH 113	3	Neosho County CC
College Algebra	MTH 178	3	Pratt CC
College Algebra	MATH 113	3	Pittsburg State U
College Algebra	MATH 100	3	Kansas State U
College Algebra	MA 1173	3	Seward County CC
Algebra	MATH 101	3	U Kansas
College Algebra	MA 116	3	Washburn U
College Algebra	MATH 111	3	Wichita State U

Comments:

Core Outcomes:

Students will be expected to use appropriate technology as one tool to achieve the following outcomes:

Analysis and Graphing of Functions and Equations

- Use functional notation.
- Recognize and distinguish between functions and relations (equations).
- Use concepts of symmetry, intercepts, left- and right-hand behavior, asymptotes, and transformations to sketch the graph of various types of functions (constant, linear, quadratic, absolute value, piecewise-defined, square root, cubic, polynomial, rational, exponential, and logarithmic) or relations (circle) given in description.
- Determine the domain and range of a function.
- Write the equation that describes a function (for types given above) or circle given its description.
- Use graphs of functions for analysis.
- Find arithmetic combinations and composites of functions.
- Find the inverse of a function.

Solutions of Equations and Inequalities

- Solve equations listed in the third bullet above, i.e., literal equations, quadratic equations by factoring and the quadratic formula, equations involving rational expressions, equations involving radicals, and equations involving absolute value expressions, along with equations involving exponential or logarithmic functions.
- Solve inequalities of the following types: linear (in one and two variables), polynomial, rational, absolute value.
- Solve systems of inequalities by graphing.
- Apply equations from the first bullet in this core outcome to real-world situations, including but not limited to depreciation, growth and decay, and max/min problems.
- Examine and analyze data, make predictions/interpretations, and do basic modeling.
- Solve systems of equations by various methods, including matrices.

Comments:

Participants:

This information is not available.

Discipline: Mathematics

General Course Title: Intermediate Algebra

Date Developed (and any modification): Unknown

Courses from Each Participating College/University for which Core Outcomes Apply:

Course Title	Course Number	Credit Hours	Institutions
Intermediate Algebra	MAT 020	3	Allen County CC
Intermediate Algebra	MATH 1824	3	Barton County CC
Intermediate Algebra	MA 125	3	Butler CC
Intermediate Algebra	MA 110	3	Cloud County CC
Intermediate Algebra	MATH 102	3	Coffeyville CC
Intermediate Algebra	MA 177	3	Colby CC
Intermediate Algebra	MTH 4410	3	Cowley County CC
Intermediate Algebra	MATH 091	3	Dodge City CC
Intermediate Algebra	MA 098	3	Emporia State U
Intermediate Algebra	MA 010	3	Fort Hays State U
Intermediate Algebra	MAT 1073	3	Fort Scott CC
Intermediate Algebra	MATH 107	3	Garden City CC
Intermediate Algebra	MAT 103	3	Highland CC
Intermediate Algebra	MA 105	3	Hutchinson CC
Intermediate Algebra	DEV 0334	3	Independence CC
Intermediate Algebra	MATH 116	3	Johnson County CC
Intermediate Algebra	MATH 104	3	Kansas City Kansas CC
Intermediate Algebra	MA 1718	3	Labette CC
Intermediate Algebra	MATH 112	3	Neosho County CC
Intermediate Algebra	MTH 130	3	Pratt CC
Intermediate Algebra	MATH 019	3	Pittsburg State U
Intermediate Algebra	MATH 010	3	Kansas State U
Intermediate Algebra	MA 1103	3	Seward County CC
Intermediate Math	MATH 002	3	U Kansas
Intermediate Algebra	MA 104	3	Washburn U
Intermediate Algebra	MATH 012	3	Wichita State U

Comments:

Core Outcomes:

It is assumed that students entering an Intermediate Algebra course will have competencies from prerequisite courses. Students will be expected to use appropriate technology as one tool to achieve the following outcomes:

Arithmetic and Algebraic Manipulation

- Factor quadratic expressions, expressions of quadratic form, special forms, and factor by grouping.
- Perform addition, subtraction, multiplication, and division on rational expressions.
- Simplify complex fractions.
- Apply the laws of exponents to simplify expressions containing rational exponents.
- Apply the laws of radicals to perform addition, subtraction, and multiplication on expressions involving radicals. Rationalize denominators containing radicals.
- Simplify radicals containing negative radicands. Perform arithmetic operations on complex numbers.
- Evaluate functions using function notation.

Equations and Inequalities

- Solve linear inequalities in one variable showing solutions both on the real number line and in interval notation.
- Solve literal equations, including those that require factoring.
- Solve systems of linear equations in two variables.
- Solve equations by factoring and quadratic formula.
- Solve equations containing rational expressions.
- Solve equations involving radicals.
- Solve linear absolute value equations and inequalities in one variable.
- Develop and solve mathematical models including variation, mixture, motion, work, and geometrical applications.

Graphs on a Coordinate Plane

- Graph linear inequalities.
- Graph quadratic functions.

Analysis of Equations and Graphs

- Determine an equation of a line given either sufficient information (two points) or a particular condition (perpendicular to a given line, parallel to a given line through a specific point, through a specific point with a given slope, etc.).
- Calculate the distance between two points.
- Distinguish between functions and relations using the Vertical Line Test.
- Identify the domain and range of a function given its graph.

Comments:

Participants:

This information is not available.

General Course Title: (Plane) Trigonometry

Date Developed (and any modification): modified September 2008

Courses from Each Participating College/University for which Core Outcomes Apply:

Courses titles from each participating College/University for which the core competencies apply:

Course title	Course Number	Credits	Institutions
Plane Trigonometry	MAT 106	3	Allen
Trigonometry	MATH 1830	3	Barton
Trigonometry	MA 140	3	Butler
Trigonometry	MA 112	3	Cloud
Trigonometry	MATH 106	3	Coffeyville
Plane Trigonometry	MA 185	3	Colby
Trigonometry	MTH 4425	3	Cowley
Trigonometry	MATH 110	3	Dodge City
Trigonometry	MA 112	2	Emporia
Plane Trigonometry	MA 122	3	Fort Hays State
Trigonometry	MAT 1093	3	Fort Scott
Plane Trigonometry	MATH 109	3	Garden City
Plane Trigonometry	MAT 105	3	Highland
Trigonometry	MATH 172	3	Johnson County
Plane Trigonometry	MA 107	3	Hutchinson
Plane Trigonometry	MAT 1093	3	Independence
Trigonometry	MATH 112	2	Kansas City Kansas
Trigonometry	MA 1730	3	Labette
Plane Trigonometry	MATH 122	3	Neosho
Trigonometry	MTH 183	3	Pratt

Trigonometry	MATH 122	3	PSU
Plane Trigonometry	MATH 150	3	KSU
Trigonometry	MA 1183	3	Seward
Trigonometry	MATH 103	2	University of Kansas
Trigonometry	MA 117	3	Washburn
Trigonometry	MATH 123	3	Wichita State University

Comments:

Core Competencies:

It is assumed that students entering a Trigonometry course will have competencies from previous courses. Students will be expected to use appropriate technology as one tool to achieve competency in this course. The student will:

1. Understand the basic definitions of trigonometric functions using both a right triangle and the unit circle.
2. Solve right triangles, and know trigonometric function values for special angles.
3. Understand radian definition and measurement, and understand circular functions as real-valued functions.
4. Analyze the graphs of the six basic trigonometric functions and their arithmetic combinations using the concepts of period, phase shift, amplitude, and displacement.
5. Derive/verify trigonometric identities, including but not limited to double angle, half angle, angle sum and angle difference identities.
6. Define, graph, and analyze inverse trigonometric functions.
7. Solve equations involving trigonometric functions.
8. Find solutions of oblique triangles using the Law of Cosines or Law of Sines.
9. Solve applications, including but not limited to vectors.

Discipline: Mathematics

General Course Title: Calculus I

Date Developed (and any modification): September 14, 2007; modified September 12, 2008

Courses from Each Participating College/University for which Core Outcomes Apply:

Course Title	Course Number	Credit Hours	Institution
Calculus with Analytic Geometry I	MAT 123	5	Allen County CC
Analytic Geometry and Calculus I	MATH 1832	5	Barton County CC
Calculus with Analytic Geometry I	MA 151	5	Butler CC
Analytic Geometry and Calculus I	MA 120	5	Cloud County CC
Calculus with Analytic Geometry I	MATH 115	5	Coffeyville CC
Calculus I	MA 220	5	Colby CC
Calculus I	MTH 4435	5	Cowley County CC
Analytic Geometry and Calculus I	MATH 120	5	Dodge City CC
Calculus I	MA 161	5	Emporia State U
Analytic Geometry and Calculus I	MA 234	5	Fort Hays State U
Calculus with Analytic Geometry I	MAT 1015	5	Fort Scott CC
Calculus and Analytic Geometry I	MATH 122	5	Garden City CC
Calculus I	MAT 106	5	Highland CC
Analytical Geometry and Calculus I	MA 111	5	Hutchinson CC
Analytic Geometry and Calculus I	MAT 1055	5	Independence CC
Calculus I	MATH 241	5	Johnson County CC
Calculus and Analytic Geometry I	MATH 122	5	Kansas City Kansas CC
Calculus I	MA 1751	5	Labette CC
Analytic Geometry and Calculus I	MATH 150		Neosho County CC
Calculus I	MATH 150	5	Pittsburg State U
Analytical Geometry and Calculus I	MTH 191	5	Pratt CC
Analytical Geometry and Calculus I	MATH 220	5	Kansas State U
Analytic Geometry and Calculus I	MA 2605	5	Seward County CC
Calculus I	MATH 121	5	U Kansas
Calculus and Analytic Geometry I	MA 151	5	Washburn U
Calculus I	MATH 242	5	Wichita State U

Comments:

Core Outcomes:

(Content Outline and Competencies for Engineering Calculus I)

Using Limits

- Evaluation of Limits
  - Evaluate the limit of a function at a point both algebraically and graphically.
  - Evaluate the limit of a function at infinity both algebraically and graphically.
  - Use the definition of a limit to verify a value for the limit of a function.
- Use of Limits
  - Use the limit to determine the continuity of a function.
  - Apply the Intermediate-Value Theorem.
  - Use the limit to determine differentiability of a function.
- Limiting Process
  - Use the limiting process to find the derivative of a function.

Finding Derivatives

- Find derivatives involving powers, exponents, and sums.
- Find derivatives involving products and quotients.
- Find derivatives involving the chain rule.
- Find derivatives involving exponential, logarithmic, and trigonometric functions.
- Find derivatives involving hyperbolic and inverse trigonometric functions.*****
- Find derivatives involving implicit differentiation.
- Use the derivative to find velocity, acceleration, and other rates of change.
- Use the derivative to find the equation of a line tangent to a curve at a given point.

Using Derivatives

- Curve Sketching
  - Use the first derivative to find critical points.
  - Apply the Mean-Value Theorem for derivatives.
  - Determine the behavior of a function using the first derivative.
  - Use the second derivative to find inflection points.
  - Determine the concavity of a function using the second derivative.
  - Sketch the graph of the function using information gathered from the first and second derivatives.
  - Interpret graphs of functions.
- Applications of Derivatives
  - Use optimization techniques in areas such as economics, the life sciences, the physical sciences, and geometry.
  - Solve related rates problems.
  - Use Newton's Method.
  - Use differentials to estimate change.
  - Find limits using L'Hopital's Rule.*****

Finding Integrals

- Find area using Riemann sums and integrals.
- Express the limit of a Riemann sum as a definite integral.

- Evaluate the definite integral using geometry.
- Integrate algebraic, exponential,* and trigonometric functions.
- Evaluate definite integrals using the Fundamental Theorem of Calculus.
- Apply the Mean-Value Theorem for integrals.
- Integrate indefinite integrals.
- Integrate using substitution.
- Integrate using numerical techniques.
- Integrate using integration by parts and trigonometric substitutions*
- Evaluate improper integrals*

Using the Integral

- Solve a differential equation by separation of variables.*
- Solve initial value problems.*
- Solve applications of exponential increase and decrease.*
- Compute areas and volumes using shell and disk methods; compute arc lengths and the average value of a function.*
- Applications to physics, engineering, and geometry (solid figures).*

*Some Regents Universities require these topics for admission to Calculus II.

Comments:

(The following statement was composed by Dr. Jack Porter of the University of Kansas and Prof. Jeff Frost of Johnson County Community College. Although the group agreed that such a statement should be inserted into the standards, the text of the statement was not voted on by the group.)

Kansas Public College and University mathematics professors believe that a strong foundation in the concepts of calculus will lead to success in careers that have a strong emphasis in critical thinking, such as engineering, computer science, or biotechnology. However, this will not happen if calculus is taught at primarily a skills and formula level without sufficient time to engage students in the deeper, conceptual tenets of calculus. All calculus teachers have an obligation to the mathematics community to ensure that students completing a first-semester, mainstream calculus course understand the material in a rigorous fashion at the level required to pass the AP Calculus examinations AB and BC.

In addition to the core outcomes for Calculus I agreed upon at the Wichita meetings (September 2008), a few schools believe that a first course in calculus with a longer list of competencies will better prepare students who are working toward degrees in math-related fields. Specifically, the University of Kansas and Johnson County Community College have course outlines that cover additional topics beyond the core competencies. Because of these additional topics, students attempting to transfer into one of these colleges may find the need to take additional calculus courses.

Participants:

Walt Regehr	Allen County CC	regehr@allencc.edu
Joe Harrington	Barton County CC	harringtonj@bartonccc.edu
Brian Howe	Barton County CC	howeb@bartonccc.edu
Kent Russell	Barton County CC	Russellk@bartonccc.edu

Kathy Starke	Butler CC	kstarke@butlercc.edu
Gayathri Kambhampati	Cloud County CC	gkambhampati@clous.edu
Timothy L. Warkentin	Cloud County CC	tlwarkentin@hotmail.com
Mark Whisler	Cloud County CC	mwhisler@cloud.edu
Uwe Conrad	Cowley County CC	conrad@cowley.edu
Greg Nichols	Cowley County CC	nichols@cowley.edu
Kent Craghead	Dodge City CC	kent@dc3.edu
Larry Scott	Emporia State U	lscott@emporia.edu
Joe Yanik	Emporia State U	hyanik@emporia.edu
Ron Sandstrom	Fort Hays State U	rsandstr@fhsu.edu
Kathy Malone	Fort Scott CC	kathym@fortscott.edu
DeeAnn VanLuyck	Fort Scott CC	deannev@fortscott.edu
Judy Stubblefield	Garden City CC	judy.stubblefield@gcccks.edu
Carol L Tracy	Highland CC	cltracy@highlandcc.edu
David Bosworth	Hutchinson CC	bosworthd@hutchcc.edu
Sherri Rankin	Hutchinson CC	rankins@hutchcc.edu
Pam Turner	Hutchinson CC	turnerp@hutchcc.edu
Garry Block	Johnson County CC	gblock2@jccc.edu
Brenda Edmonds	Johnson County CC	bedmonds@jccc.edu
Jeff Frost	Johnson County CC	
Mike Martin	Johnson County CC	mmartin@jccc.edu
Steven J Wilson	Johnson County CC	swilson@jccc.edu
Margaret Hathaway	Kansas City Kansas CC	margeret@kckcc.edu
Wayne Martin	Kansas City Kansas CC	wmartin@kckcc.edu
John Soptick	Kansas City Kansas CC	jsoptick@kckcc.edu
John Maginnis	Kansas State U	maginnis@math.ksu.edu
Tom Roberts	Kansas State U	tcr@ksu.edu
David Beach	Labette CC	davidb@labette.edu
Carlie Shannon	Manhattan Area TC	carlieshannon@matc.net
Nathan Stanley	Neosho County CC	nstanley@neosho.edu
Tim Flood	Pittsburgh State U	tflood@pittstate.edu
Sarah Jackson	Pratt CC	Sarahj@prattcc.edu
Luke Dowell	Seward County CC	luke.dowell@sccc.edu
Kevin Charlwood	Washburn U	kevin.charlwood@washburn.edu
Laurie Mulford	Wichita Area TC	lmulford@watc.edu
Stephen W. Brady	Wichita State U	brady@math.wichita.edu
Katherine Earles	Wichita State U	earles@math.wichita.edu

Discipline: Mathematics

General Course Title: Elementary Statistics

Date Developed (and any modification): September 2005

Courses from Each Participating College/University for which Core Outcomes Apply:

Course Title	Course Number	Credit Hours	Institution
Elementary Statistics	MAT 115	3	Allen County CC
Elements of Statistics	MATH 1829	3	Barton County CC
Statistics for Management, Life, and Social Sciences	MA 220	5	Butler CC
Elementary Statistics	MA 114	3	Cloud County CC
Elementary Statistics	MATH 250	3	Coffeyville CC
Elements of Statistics	MA 205	3	Colby CC
Elementary Statistics	MTH 4423	3	Cowley County CC
Elementary Statistics	MATH 230	3	Dodge City CC
Elementary Statistics	MA 120	3	Emporia State U
Elements of Statistics	MA 250	3	Fort Hays State U
Elementary Statistics	MAT 2253	3	Fort Scott CC
Fundamentals of Statistics	MATH 110	3	Garden City CC
Basic Statistics	MAT 203	3	Highland CC
Elements of Statistics	MA 108	3	Hutchinson CC
Statistics	MAT 1103	3	Independence CC
Statistics	MATH 181	3	Johnson County CC
Statistics	MATH 115	3	Kansas City Kansas CC
Elementary Statistics	MA 1720	3	Labette CC
Elementary Statistics	MATH 143	3	Neosho County CC
Elementary Statistics	MATH 143	3	Pittsburg State U
Statistics	MTH 181	3	Pratt CC
n/a	n/a	n/a	Kansas State U
Elementary Statistics	MA 2103	3	Seward County CC
Statistics	MATH 365	3	U Kansas
Statistics	MA 140	3	Washburn U
n/a	n/a	n/a	Wichita State U

Comments:

Core Outcomes:

Students will be expected to use appropriate technology as one tool to achieve the following outcomes:

Basic Descriptive Statistics: Organizing and Describing Data

- For a given set of data, draw a dotplot, histogram, stem-and-leaf diagram, and a boxplot.
- Describe the general shape of data, skewed left, skewed right, normal, or other symmetric.
- Calculate the measures of central tendency including mean, median, and mode.
- Calculate the measures of dispersion including range, standard deviation, and interquartile range; explain the meaning of dispersion as it relates to a problem.
- Use a statistical package on a graphics calculator or a computer to enter data and analyze results.

Introduction to Probability: Finding the Theoretical Probability of an Event

- Use probability notation including the "or" condition and the "and" condition.
- Determine whether or not two events are mutually exclusive.
- Determine whether or not two events are independent.
- Calculate conditional probabilities; explain the meaning of conditional probabilities; use conditional notation.

Random Variables: Determining Probabilities of a Random Variable

- Determine the expected value and the standard deviation of a discrete random variable.
- Determine probabilities for a discrete random variable.

Special Probability Functions: Using Functions to Solve Probabilities of Events

- Use the binomial formula to solve probability problems with two outcomes and independent events.
- Use the normal distribution to solve percent problems for normally distributed populations.
- Use the normal distribution to solve probability problems for normally distributed random variables.

Random Sampling and Sampling Theory: Generating Distributions for Sample Means

- Calculate the mean for a distribution of sample means.
- Calculate the standard deviation for a distribution of sample means.
- Perform a normal probability plot; describe the shape of the population distribution based on the plot.
- Analyze the Central Limit Theorem.

Estimating the Mean: Using Statistics to Determine Averages of a Population

- Construct confidence interval for a population mean with known population standard deviation; explain the meaning in terms of the problem.
- Construct a confidence interval for a population mean with unknown population standard deviation; explain the meaning in terms of the problem.
- Construct a confidence interval for a population proportion; explain the meaning in terms of the problem.

Hypothesis Tests: Finding Significance

- Perform a hypothesis test for a sample mean with known population standard deviation.
- Perform a hypothesis test for a sample mean with unknown population standard deviation.
- Perform a hypothesis test for a sample proportion.
- Perform a hypothesis test with more than two categories for procedures using the chi-square distribution (optional).
- Explain Type I and Type II errors with respect to a problem (optional).
- Calculate the P-value of a hypothesis test; explain the meaning in terms of the problem.

Linear Regression: Making Predictions with Linear Data

- Calculate a linear regression equation; explain the meaning in terms of the problem.
- Use a linear regression equation to make predictions about data.
- Calculate the coefficient of determination for a linear regression equation; use the coefficient of determination to explain the strength of the regression equation.

Comments:

Participants:

This information is not available.

Minutes of the September 12, 2008, Meeting

Mathematics Minutes

Date: September 12, 2008 (Hughes Metropolitan Complex, Wichita State University)

Facilitator: Jeff Frost (Johnson County CC) filling in for Jack Porter (U Kansas)

Recorder: Mark Whisler (Cloud County CC)

Members Present:

Walt Regehr	Allen County CC	regehr@allencc.edu
Joe Harrington	Barton County CC	harringtonj@bartonccc.edu
Brian Howe	Barton County CC	howeb@bartonccc.edu
Kent Russell	Barton County CC	Russellk@bartonccc.edu
Kathy Starke	Butler CC	kstarke@butlercc.edu
Gayathri Kambhampati	Cloud County CC	gkambhampati@clous.edu
Timothy L. Warkentin	Cloud County CC	tlwarkentin@hotmail.com
Mark Whisler	Cloud County CC	mwhisler@cloud.edu
Uwe Conrad	Cowley County CC	conrad@cowley.edu
Greg Nichols	Cowley County CC	nichols@cowley.edu
Kent Craghead	Dodge City CC	kent@dc3.edu
Larry Scott	Emporia State U	lscott@emporia.edu
Joe Yanik	Emporia State U	hyanik@emporia.edu
Ron Sandstrom	Fort Hays State U	rsandstr@fhsu.edu
Kathy Malone	Fort Scott CC	kathym@fortscott.edu
DeeAnn VanLuyck	Fort Scott CC	deannev@fortscott.edu
Judy Stubblefield	Garden City CC	judy.stubblefield@gcccks.edu
Carol L. Tracy	Highland CC	cltracy@highlandcc.edu
David Bosworth	Hutchinson CC	bosworthd@hutchcc.edu
Sherri Rankin	Hutchinson CC	rankins@hutchcc.edu
Pam Turner	Hutchinson CC	turnerp@hutchcc.edu
Garry Block	Johnson County CC	gblock2@jccc.edu
Brenda Edmonds	Johnson County CC	bedmonds@jccc.edu
Jeff Frost	Johnson County CC	
Mike Martin	Johnson County CC	mmartin@jccc.edu
Steven J. Wilson	Johnson County CC	swilson@jccc.edu
Margaret Hathaway	Kansas City Kansas CC	margeret@kckcc.edu
Wayne Martin	Kansas City Kansas CC	wmartin@kckcc.edu
John Soptick	Kansas City Kansas CC	jsoptick@kckcc.edu
John Maginnis	Kansas State U	maginnis@math.ksu.edu
Tom Roberts	Kansas State U	tcr@ksu.edu
David Beach	Labette CC	davidb@labette.edu
Carlie Shannon	Manhattan Area TC	carlieshannon@matc.net
Nathan Stanley	Neosho County CC	nstanley@neosho.edu
Tim Flood	Pittsburgh State U	tflood@pittstate.edu
Sarah Jackson	Pratt CC	Sarahj@prattcc.edu
Luke Dowell	Seward County CC	luke.dowell@sccc.edu

Kevin Charlwood	Washburn U	kevin.charlwood@washburn.edu
Laurie Mulford	Wichita Area TC	lmulford@watc.edu
Stephen W. Brady	Wichita State U	brady@math.wichita.edu
Katherine Earles	Wichita State U	earles@math.wichita.edu

Meeting Notes:

A. Report and Action on Previous Meeting (if any)

None

B. Course/Core Outcomes Discussion

After opening remarks, discussion returned to a set of competencies for a first calculus course for engineers, scientists, and other groups. Various aspects of the issue were discussed, from AP classes and rubrics for granting credit for AP classes, to textbooks used, to what the level of the class should be.

After considerable discussion, the group was reminded that an agreement was almost reached two years ago about what should be in the course. More discussion ensued, and then a motion was made to accept the non-asterisked items on this list of competencies (listed below) as a set of competencies for this class. Three addenda were proposed: that this set should be considered a minimum set of competencies, that the course should be an "Early Transcendentals" course, and that a statement should be included indicating that the course should be taught at a deeper level than just basic techniques. There was further discussion, and then the question was called. The motion passed overwhelmingly, with one dissenting vote and an unknown number of abstentions.

(The following statement was composed by Dr. Jack Porter of the University of Kansas and Prof. Jeff Frost of Johnson County Community College. Although the group agreed that such a statement should be inserted into the standards, the text of the statement was not voted on by the group.)

Kansas Public College and University mathematics professors believe that a strong foundation in the concepts of calculus will lead to success in careers that have a strong emphasis in critical thinking, such as engineering, computer science, or biotechnology. However, this will not happen if calculus is taught at primarily a skills and formula level without sufficient time to engage students in the deeper, conceptual tenets of calculus. All calculus teachers have an obligation to the mathematics community to ensure that students completing a first-semester, mainstream calculus course understand the material in a rigorous fashion at the level required to pass the AP Calculus examinations AB and BC.

In addition to the core outcomes for Calculus I that were agreed upon at the Wichita meetings (September 2008), a few schools believe that a first course in calculus with a longer list of competencies will better prepare students who are working toward degrees in math-related fields. Specifically, the University of Kansas and Johnson County Community College have course outlines that cover additional topics beyond the core competencies. Because of these additional topics, students attempting to transfer into one of these colleges may find the need to take additional calculus courses.

See the Content Outline and Competencies for Engineering Calculus I in the previous core outcomes section under Calculus I.

C. Items Discussed But No Decision or Action Taken

A motion was made and accepted to collect and disseminate information about AP scores on the AB and BC calculus exams and the placement rubric that schools use to give credit. There was general agreement that we should meet next year and work on the second semester of the calculus sequence, and possibly even move on to a three semester sequence. The remainder of the meeting was spent in discussion about a "liberal arts" mathematics course that would serve as an alternative to College Algebra for certain majors. There was no action taken on this class.

D. Discussion Regarding Future Need for Meetings

The group will meet again next fall.