

**FY2006 DEPARTMENTAL ANNUAL REPORT  
OF CONTINUOUS IMPROVEMENT**

**Department of Department of Mathematics and Computer Science**

**Fort Hays State University**

**June 30, 2006**

## **I. Departmental Overview**

The Department of Mathematics and Computer Science currently has 10 FTE positions. During the past several years there has been significant turn over and flux because of retirements, untimely resignations, and non-granting of tenure. There are three full-time faculty who are ABD and another who will complete comprehensive examinations this year. Hopefully, two will finish this year. Last year's new hire Dr. Lianju Wang has a PhD in Applied Mathematics and a MS in Computer Science. He has professional working experience at Lucent; so, this fall we will propose further development of our computer science offerings in particular related to computer forensics. The demand for computer science majors has improved from the low point of the dot.com bubble burst, but, still is not what it was before the drop. The demand for mathematics secondary education majors is extremely strong; unfortunately students are not choosing that career at this time. The reasons are varied not the least of which is the low salaries for teachers. The students that we would normally recruit have many career choices most of which provide a much higher salary and do not require so many hurdles to jump over. Our SCH has decreased when compared with five years ago. This was the result of a non-replaced FTE retirement.

### **A. Departmental Mission and Vision Statements**

The Department of Mathematics and Computer Science awards both the Bachelor of Arts and Bachelor of Science in Mathematics; and the Bachelor of Science (Applied) in Computer Science. The undergraduate major programs meet the needs of students who: (a) are preparing to teach mathematics at the secondary or two-year college level; (b) plan a career in business and industry using computers or mathematics; or (c) plan to continue to study mathematics or computer science at the graduate level. Depending on their career goals, students choose one of two emphases: Teaching or Industrial/Academic, in the mathematics major; or the software development emphasis of the computer science major. Courses for students who want some knowledge of mathematics or computing as part of liberal education, or who are preparing to teach at the elementary school level, are also available.

### **B. Departmental Goals, Objectives, and Strategic Priorities**

1. Increase the number of students interested in teaching mathematics at the secondary and college level.
2. Continue to press the Kansas Legislature to provide forgivable financial awards to those students choosing to teach mathematics at the secondary level.
3. Provide the Java Programming course on-line.
4. Develop courses around the theme of Computer Forensics which could lead to a certificate.
5. Encourage students to gain Java certification.
6. Develop plans to change the "Elements of Statistics" course, in particular, from being a graphing calculator based course to a laptop based course where students use excel as well as an on-line graphing calculator.
7. Explore ways that "Mobile Computing" can enhance the delivery of course offerings.
8. Develop a problem-solving study group in connection with our Thursday Seminar.

## **II. Departmental Highlights**

**A. Departmental Productivity and Other Distinctive Departmental Accomplishments**

Department received approval from the KBOE for a middle level endorsement program. Together with the Teacher Education Dept., we obtained a grant for a three-year summer workshop for middle school teachers. Members of the faculty have been awarded two course development grants offered by the Kansas State Department of Education. These two courses will be on-line courses for in-service teachers who wish to become licensed at the middle level. One course will be on “Geometry and Measurement” and will be developed by Professors Dreiling and Weber; and the second “Calculus Concepts” will be developed by Professors Sadler and Young. Dr. Hongbiao Zeng is a Cisco certified Java instructor.

**B. Performance Indicators**

<b>Key Performance Indicator</b>	<b>Baseline FY2004</b>	<b>Actual FY2005</b>	<b>Actual FY2006</b>	<b>Goal FY2007</b>
<b>Number of New Freshmen</b>	13	7	21	10
<b>Number of Transfer Students</b>	13	8	6	10
<b>Number of Majors:</b>				
Undergraduate (first majors/second majors)	86	61	83	85
Graduate				
Departmental majors	3	4		3
MLS students				
<b>Student Credit Hour Production</b>				
Undergraduate	6743	6624	6364	6700
Graduate	74.	103	66	100
<b>FTE Faculty (Headcount)</b>				
Tenured or Tenure-track Faculty (Headcount)	7	7	7	7
	3	3	3	4

<b>Key Performance Indicator</b>	<b>Baseline FY2004</b>	<b>Actual FY2005</b>	<b>Actual FY2006</b>	<b>Goal FY2007</b>
NonTenure-Track Faculty (Headcount)  Other Faculty (Headcount/Sections Taught)	3/8	3/9	3/9	3/9
<b>Degrees Awarded</b>				
Undergraduate degrees	21	8	9	15
Graduate degrees				
Departmental degrees		2	0	1
MLS degrees				
<b>Scholarly Activity (See Section IV for documentation requirement)</b>				
Number of books, book chapters, and <b>refereed</b> articles published	0	0	9	5
Percent of faculty publishing <b>refereed</b> books, chapters, or articles	0	0	60	60
Number of <b>non-refereed</b> articles and presentations	5	9	22	20
Percent of faculty publishing <b>non-refereed</b> articles or presentations	50	50	70	70
	10	10	10	10

<b>Key Performance Indicator</b>	<b>Baseline FY2004</b>	<b>Actual FY2005</b>	<b>Actual FY2006</b>	<b>Goal FY2007</b>
Number of scholarly performances and other creative activities	100	100	100	100
	2/1	2/1	4/4	4/4
Percent of faculty in scholarly performances or other creative activities	2/100	2/100	4/100	4/100
Total number of external grant applications submitted/percent of faculty submitting				
Total number of funded external grants/percent of faculty funded				
<b>Service Activity</b>				
Percent of faculty meeting acceptable standard of service activity	20	20	20	10
	80	80	80	90
Percent of faculty meeting exceptional standard of service activity				
<b>Assurance of Student Learning</b>				
Data are collected from 8 different classes for the 9 Kansas Mathematics	Percent of students	Percent of students	Percent of students	Percent of students

<b>Key Performance Indicator</b>	<b>Baseline FY2004</b>	<b>Actual FY2005</b>	<b>Actual FY2006</b>	<b>Goal FY2007</b>
Teaching Standards.				
Knowledge indicators use portions of final exams or competency tests.				
Standard 1	Satisfactory 92%	Satisfactory 80%	Satisfactory 80%	Satisfactory 80%
	Unsatisfactory 8%	Unsatisfactory 20%	Unsatisfactory 20%	Unsatisfactory 20%
Standards 2 & 6	Satisfactory 88%	Satisfactory 40%	Satisfactory 60%	Satisfactory 60%
	Unsatisfactory 12%	Unsatisfactory 60%	Unsatisfactory 40%	Unsatisfactory 40%
Standard 3	Satisfactory 70%	Satisfactory 62.5%	Satisfactory 70%	Satisfactory 70%
	Unsatisfactory 30%	Unsatisfactory 37.5%	Unsatisfactory 30%	Unsatisfactory 30%
Standard 4	Satisfactory 100%	Satisfactory 66%	Satisfactory 70%	Satisfactory 70%
		Unsatisfactory 33%	Unsatisfactory 30%	Unsatisfactory 30%
Performance indicators use written and oral reports, final exams, lesson plans and teaching of those plans, or presentations of topics/problems				
Standard 1	Satisfactory 75%	Satisfactory 100%	Satisfactory 80%	Satisfactory 80%
	Unsatisfactory 25%		Unsatisfactory 20%	Unsatisfactory 20%
	Satisfactory 88%	Satisfactory 40%	Satisfactory 60%	Satisfactory 60%
	Unsatisfactory 12%	Unsatisfactory 60%	Unsatisfactory 40%	Unsatisfactory 40%

<b>Key Performance Indicator</b>	<b>Baseline FY2004</b>	<b>Actual FY2005</b>	<b>Actual FY2006</b>	<b>Goal FY2007</b>
Standards 2 & 6	Satisfactory 70% Unsatisfactory 30%	Satisfactory 62.5% Unsatisfactory 37.5%	Satisfactory 70% Unsatisfactory 30%	Satisfactory 70% Unsatisfactory 30%
Standard 3	Satisfactory 86% Unsatisfactory 14%	Satisfactory 100%	Satisfactory 90% Unsatisfactory 10%	Satisfactory 90% Unsatisfactory 10%
Standard 4		Data for other standard available		
<b>Other Departmental Key Performance Indicators (up to 3 additional measures, optional)</b>				
Monitor the correlation coefficient between scores on posttest and grades in College Algebra.	.707(spring)	.795(spring)	.747(spring)	.8(spring)
Monitor the percentage of (A-B-C-D) students obtaining 70% or better on the final exam in College Algebra.	39(spring) fall data available	44(spring)	54(spring)	45(spring)

**C. Current Quality Initiatives and Results**

<b>FY 2006 Quality Initiatives</b>	<b>Results</b>
Improve University wide advising	The use of ACT's to place students into

regarding the use of ACT's for College Algebra.	College Algebra or higher level courses has had mixed success. There are still some advisors who for whatever reason do not consider the ACT profile when advising students. These advisors have been consulted each semester about the prerequisites for College Algebra.
Develop more on-line courses in computer science and more courses whose content deals with computer forensics.	The Department will be submitting to the Faculty Senate and Graduate Council at least three new course proposals related to computer forensics and security topics.

<b>FY 2007 Quality Initiatives</b>	<b>Responsible Party, Resources, and Plan</b>
Continue to monitor use of ACT sub-scores in MATH and SCI to predict success in College Algebra	Dr. Ron Sandstrom will be responsible for developing a success/failure rate student of ay 2005 college algebra students in regard to the students ACT math and science scores as well as whether or not the students have taken a remedial course
Shepard the three computer science course proposals through the approval process.	Drs. Zeng and Wang will be responsible to attend appropriate meeting and answer questions about scope and level of said courses.

### III. Strategic Plan and Opportunities for Improvement for FY2007

#### A. Departmental Reflection of Strengths, Weaknesses, Opportunities, and Threats

<b>Strengths</b>	<b>Weaknesses/Needs</b>
Excellent teaching as evidenced by ratings on TEVALs. Competent and energetic faculty.	Only two tenured faculty requires much support from faculty outside the department for making tenure and promotions recommendations. We need another FTE to just handle the demand for on-line mathematics and computer science courses.
<b>Opportunities</b>	<b>Threats</b>
Expand offerings in terms of number of sections of on-line courses: Intermediate Algebra, College Algebra, and Elements of Statistics. Expand offerings for in-service middle school teachers.	Lack of competing salaries for secondary mathematics teachers makes the future enrollment increases unlikely.

**B. Opportunities for Improvement**

Short Term OFI	Resources Required	Expected Outcome and Completion Date
Change graphing calculator based courses to laptop based courses.	All classrooms on third floor Rarick will have to be equipped with tables rather than desks.	Students will be better equipped to enter the market place because they process an updated set of skills.

Long Term Strategic Initiatives	Resources Required	Expected Outcome

**IV. Supporting Materials**

**A. Department Degree Program Affinity Diagram(s)**

**Department of Mathematics and Computer Science  
Affinity Diagram for Mathematics Program**

Characteristics of Mathematics Program	Expected Learning Outcomes	Curriculum	Assessment Approach and Methods	Results	Curricular and/or Pedagogical Changes
<p><b>Knowledgeable</b> They apply qualitative and quantitative methods to solve problems. They use mathematical theories, terminology, and skills to model real world situations. They are familiar with a broad range of areas within mathematics, the</p>	<p><b>Goal</b> To model real world situations. <b>Objective #1</b> To define a problem clearly.  <b>Goal</b> To apply appropriate techniques to analyze mathematical problems resulting from a modeled real world situation.</p>	<p><b>Program Core Curriculum Develops Knowledge/Skills</b> MATH 234,235,236 Analytical Geometry and Calculus I, II, and III MATH 240 Linear Algebra MATH 250 Elements of Statistics</p>	<p><b>Program Employment Survey:</b> Yearly collection of data on types of employment of graduates to determine whether graduates obtain employment matching the student's option.</p>	<p>2006 WEB survey will be going out this summer.  Antidotal evidence that most of these students are going on to further education in some field.</p>	<p>Elements of Statistics was added to the list of major courses several years ago. Hence, MATH 350 could be viewed as a successor</p>

<b>Characteristics of Mathematics Program</b>	<b>Expected Learning Outcomes</b>	<b>Curriculum</b>	<b>Assessment Approach and Methods</b>	<b>Results</b>	<b>Curricular and/or Pedagogical Changes</b>
<p>terminology, major theorems, and methods of argument. They apply a broad knowledge to obtain new theoretical results or practical applications.</p> <p><b>Logical</b> They express mathematical thoughts in a way that can be clearly understood by others. They carefully consider assertions before accepting or rejecting them.</p> <p>They have the ability to construct and follow a step-by-step logical argument.</p>	<p><b>Objective #1</b> To evaluate and choose an appropriate solution strategy.</p> <p><b>Objective #2</b> To be an effective problem solver using optimization techniques to obtain the best possible solution to a problem.</p> <p><b>Goal</b> To follow and exhibit a logical mathematical argument.</p> <p><b>Objective #1</b> To communicate a solution to colleagues, professionals in the field, and the general public.</p>	<p>CSCI 261 Computer Science I MATH 350 Introduction to Mathematical Statistics MATH 354 Differential Equations MATH 510 Higher Algebra Or MATH 546 Discrete Structures MATH 531 Advanced Calculus MATH 665 Numerical Analysis</p> <p><b>Develops Perspective</b> MATH 575 Seminar</p>	<p>Results are used to advise students in making career choices.</p> <p><b>Alumni Survey:</b> Survey graduates five years after graduation to determine their perception of their mathematics education in preparing them for careers and further education. Results are used to evaluate the timeliness and appropriateness of the curricula.</p> <p><b>Model Programs:</b> Collect from American Mathematical Society, Mathematics Association of America, National Council of Teachers of Mathematics, Association of Computing Machinery examples of suggested curricula. Results are used to compare the</p>	<p>Courses have been aligned with curricular suggestion of MAA and AMS.</p> <p>Antidotal evidence suggested that more courses in statistics would be helpful in several careers.</p> <p>Antidotal evidence suggests that the name of MATH 350 Introduction to Mathematical Statistics should have the Introduction removed.</p>	<p>course.</p> <p>A catalog change will be requested to change the name of MATH 350.</p>

<p><b>Characteristic s of Mathematics Program</b></p>	<p><b>Expected Learning Outcomes</b></p>	<p><b>Curriculum</b></p>	<p><b>Assessment Approach and Methods</b></p>	<p><b>Results</b></p>	<p><b>Curricular and/or Pedagogica l Changes</b></p>
			<p>major curricula against national standards.</p> <p><b>Individual Achievement Capstone Course:</b> All students enroll in Seminar in Mathematics in which the individual student selects a topic, researches it, writes a paper, and gives an oral presentation to the seminar group. All faculty read the paper and attend the talk. The student's grade is then assigned by departmental consensus. Success requires the ability to work independently, synthesize and extend mathematical knowledge and the ability to impart that knowledge to others. Faculty assess the appropriateness of the individual student's major courses.</p> <p><b>Portfolio:</b> All</p>		

Characteristics of Mathematics Program	Expected Learning Outcomes	Curriculum	Assessment Approach and Methods	Results	Curricular and/or Pedagogical Changes
			students will prepare a portfolio illustrating the range of knowledge, skills and perspective possessed.		

**Department of Mathematics and Computer Science  
Affinity Diagram for Mathematics Education Program**

Characteristics of Mathematics Education Program	Expected Learning Outcomes	Curriculum	Assessment Approach and Methods	Results	Curricular and/or Pedagogical Changes
<p><b>Knowledgeable</b> They apply mathematical concepts and theories appropriately. They apply educational pedagogies and theories appropriately. They know how to use available mathematics educational materials and technology.</p> <p><b>Analytical/Precise</b> They use higher level reasoning skills especially those tied to the logic of mathematics, to solve problems. They recognize and construct valid mathematical argument.</p> <p><b>Dedicated/Desire to Improve</b> They adjust teaching strategies to fit the learning styles of their students.</p>	<p><b>Goal</b> To be prepared to teach mathematics at the 6-12 level.</p> <p><b>Objective #1</b> The learner will exhibit adequate communication skills.</p> <p><b>Objective #2</b> The learner will exhibit skills in curriculum planning and implementation.</p> <p><b>Objective #3</b> The learner will exhibit a high level of</p>	<p><b>Program Core Curriculum Develops Knowledge/Skills</b> MATH 234,235,236 Analytical Geometry and Calculus I, II, and III MATH 240 Linear Algebra MATH 250 Elements of Statistics CSCI 261 Computer Science I MATH 350 Introduction to Mathematical Statistics MATH 510 Higher Algebra MATH 520 Modern Geometry</p>	<p><b>Program</b></p> <p><b>Employment Survey:</b> Yearly collection of data on types of employment of graduates to determine whether graduates obtain employment matching the student's option. Results are used to advise students in making career choices.</p> <p><b>Alumni Survey:</b> Survey graduates five years after graduation to determine their perception of their mathematics</p>	<p>2006 WEB survey will be going out this summer.</p> <p>Initial assessment measures indicate much unevenness in student knowledge and performance</p>	<p>Knowledge and performance rubrics are continually revised to align with current KBOE standards.</p> <p>Mechanisms must be developed to ensure</p>

<p align="center"><b>Characteristics of Mathematics Education Program</b></p>	<p align="center"><b>Expected Learning Outcomes</b></p>	<p align="center"><b>Curriculum</b></p>	<p align="center"><b>Assessment Approach and Methods</b></p>	<p align="center"><b>Results</b></p>	<p align="center"><b>Curricular and/or Pedagogical Changes</b></p>
<p>They are aware of related professional organizations and participate selectively.</p> <p><b>Innovative/Adaptive</b></p> <p>They are aware of new learning theories and teaching strategies and are open to trying them.</p> <p>They are aware of new technologies and materials that can be used in the teaching of mathematics and are open to trying them.</p> <p><b>Communicative</b></p> <p>They express themselves effectively in oral and written discourse.</p> <p><b>Cooperative</b></p> <p>They work well with others within their educational institutions, departments, and classrooms.</p>	<p>competency of the mathematics taught at the 6-12 level.</p> <p><b>Objective #4</b></p> <p>The learner will demonstrate appropriate teaching strategies.</p> <p><b>Goal</b></p> <p>To model real world situations.</p> <p><b>Objective #1</b></p> <p>The learner will demonstrate the ability to define the real world situation clearly.</p> <p><b>Objective #2</b></p> <p>The learner will demonstrate the ability to simulate the real world situation by choosing appropriate methods, materials, and technology.</p> <p><b>Goal</b></p> <p>To apply appropriate techniques to analyze mathematical and educational problems.</p> <p><b>Objective #1</b></p> <p>The learner will demonstrate the ability to evaluate and choose an appropriate solution strategy.</p> <p><b>Objective #2</b></p>	<p><b>Develops Perspective</b></p> <p>MATH 276 Apprenticeship-Mathematics</p> <p>MATH 277 Early Field Experience: Mathematics Education</p> <p>MATH 370 History of Mathematics</p> <p>MATH 381 Teaching of Secondary School Mathematics</p> <p>MATH 575 Seminar in Mathematics Elective</p>	<p>education in preparing them for careers and further education. Results are used to evaluate the timeliness and appropriateness of the curricula.</p> <p><b>Model Programs:</b></p> <p>Collect from American Mathematical Society, Mathematics Association of America, National Council of Teachers of Mathematics, Association of Computing Machinery examples of suggested curricula. Results are used to compare the major curricula against national standards.</p> <p><b>Individual Achievement Capstone Course:</b></p> <p>All students enroll in Seminar in Mathematics in which the individual student selects a topic, researches it, writes a paper, and gives an oral presentation to the seminar group. All faculty read the paper and attend the talk. The student's grade is then assigned by departmental consensus. Success requires the ability to work independently, synthesize and extend mathematical knowledge and the ability to impart that know to others. Faculty assess the appropriateness of the individual student's major courses.</p> <p><b>Portfolio:</b> All students will prepare a portfolio illustrating the range of knowledge, skills and perspective possessed</p>	<p>e ratings.</p> <p>All course and program objectives are in alignment with current KBOE standards for Secondary Mathematics teachers. These standards are under continual revision so this in an ongoing process.</p>	<p>transfer students meet the same expectations as other students.</p>

<p style="text-align: center;"><b>Characteristics of Mathematics Education Program</b></p>	<p style="text-align: center;"><b>Expected Learning Outcomes</b></p>	<p style="text-align: center;"><b>Curriculum</b></p>	<p style="text-align: center;"><b>Assessment Approach and Methods</b></p>	<p style="text-align: center;"><b>Results</b></p>	<p style="text-align: center;"><b>Curricular and/or Pedagogical Changes</b></p>
	<p>The learner will demonstrate effective problem solving techniques to obtain a valid solution to a problem.</p> <p style="text-align: center;"><b>Goal</b></p> <p>To think logically and make appropriate decisions based in critical thinking.</p> <p><b>Objective #1</b> The learner will demonstrate the ability to follow and exhibit a logical mathematical argument.</p> <p><b>Objective #2</b> The learner will demonstrate proofs of elementary theorems.</p> <p style="text-align: center;"><b>Goal</b></p> <p>To possess a mathematical and technical maturity which enables them to read, analyze, and communicate logically and effectively in a professional situation.</p> <p><b>Objective #1</b> The learner will demonstrate the ability to read undergraduate mathematics and comprehend the concepts.</p> <p><b>Objective #2</b> The learner will demonstrate</p>				

<b>Characteristics of Mathematics Education Program</b>	<b>Expected Learning Outcomes</b>	<b>Curriculum</b>	<b>Assessment Approach and Methods</b>	<b>Results</b>	<b>Curricular and/or Pedagogical Changes</b>
	the ability to communicate solutions and ideas to others using available technology.				

**Department of Mathematics and Computer Science**  
**Affinity Diagram for Computer Science Program**

<b>Characteristics of Computer Science Program</b>	<b>Expected Learning Outcomes</b>	<b>Curriculum</b>	<b>Assessment Approach and Methods</b>	<b>Results</b>	<b>Curricular and/or Pedagogical Changes</b>
<p><b>Knowledgeable</b> They use theories, terminology, and skills to model real world situations.</p> <p><b>Problem Solvers</b> They model real world situations.</p> <p><b>Analytical/Precise</b> They use higher level reasoning skills to solve problems.</p> <p><b>Creative/Flexible</b></p>	<p><b>Goal</b> To model real world situations.</p> <p><b>Objective #1</b> The learner will demonstrate the ability to define a problem clearly.</p> <p><b>Goal</b> To analyze software problems resulting from a real world situation.</p>	<p><u>A. Program Core Curriculum</u> <i>Develops Knowledge</i> CSCI 261 Computer Science I (C) CSCI 345 Logical Foundations of Computing CSCI 361 Computer Science II (C++) CSCI 363 Computer Operating Systems CSCI 365 Systems Architecture CSCI 465 Programming Languages CSCI 562 Data Structures and</p>	<p><b>Program</b></p> <ul style="list-style-type: none"> <li>Five year program review as developed by Fort Hays' College of Arts &amp; Sciences</li> <li>Survey student and employer satisfaction with program and graduates.</li> </ul>	<p>2006 WEB survey of graduates will be on-line this summer.</p> <p>Antidotal evidence we need to encourage students to sit for JAVA certification.</p> <p>Student projects from all courses</p>	<p>An emphasis in Networking was added.</p> <p>Courses are being developed and will be proposed this year whose content is related to computer forensics</p>

<b>Characteristics of Computer Science Program</b>	<b>Expected Learning Outcomes</b>	<b>Curriculum</b>	<b>Assessment Approach and Methods</b>	<b>Results</b>	<b>Curricular and/or Pedagogical Changes</b>
<p>They analyze problems from a fresh perspective.</p> <p><b>Strategy Minded</b> They see the big picture including the political, social, and economic context of which they are a part.</p> <p><b>Innovative/Adaptive</b> They are knowledgeable about new technologies and how to deploy them.</p> <p><b>Dedicated/Patient</b> They continue to work on problems that do not meet with immediate success.</p> <p><b>Cooperative</b> They are team players and see the end-user's point of view.</p> <p><b>Competitive/Desire to Improve</b> They are aware of marketplace dynamics and organizational realities; they stay ahead of change by initiating change.</p> <p><b>Communicative</b> They express themselves effectively in oral and written discourse.</p>	<p><b>Objective #1</b> The learner will demonstrate the ability to determine a problem's tractability.</p> <p><b>Objective #2</b> The learner will demonstrate the ability to determine when consultation with outside experts is appropriate.</p> <p><b>Objective #3</b> The learner will demonstrate the ability to evaluate and choose an appropriate solution strategy.</p> <p><b>Objective #4</b> The learner will demonstrate the ability to study, specify, design, implement, test, modify, document, and maintain that solution.</p> <p><b>Goal</b> To be knowledgeable about new technologies</p>	<p>Algorithm Design</p> <p><b>Develops Skills</b> CSCI 369 Java Programming CSCI 466 Software Engineering I CSCI 564 Networks and Data Communication CSCI 566 Software Engineering II <i>Develops Perspective</i> CSCI 160 Orientation to Computer Science CSCI 322 Interactive Systems Design CSCI 567 Internship</p> <p><u>B. Cognate Focus Tracks</u> <u>(Select one Track and take up to 23 hrs.)</u> <b>Track 1: Business Emphasis</b> ACCT 203 Financial Accounting ACCT 204 Managerial Accounting CIS 304 Management Information Systems ECFI 305 Managerial Finance MGT 301 Management Principles MKT 301 Marketing Principles MGT 408 Production</p>	<p>The results are used to improve the program</p> <ul style="list-style-type: none"> <li>Collect outcome information relating to program goals</li> <li>Entrance and exit testing of students</li> </ul> <p><b>Students</b></p> <ul style="list-style-type: none"> <li>The student will prepare a portfolio illustrating the range of knowledge, skills and perspective possessed.</li> <li>Written examinations and completion of laboratory projects in all required courses</li> <li>Capstone course: Software Engineering II and Internship to satisfy learning-in-context</li> </ul>	<p>examined for appropriateness . Seminar papers and oral presentations have been rated by the faculty at the "C" or better level.</p> <p>Antidotal evidence suggests more computer security and forensics because several graduates have taken employment with Agencies of the Federal Government or companies under contact with said agencies.</p>	<p>and security issues.</p> <p>Need to develop more internships with local and state wide companies in particular with KBI in Topeka and FBI computer forensics Lab in KC</p>

<b>Characteristics of Computer Science Program</b>	<b>Expected Learning Outcomes</b>	<b>Curriculum</b>	<b>Assessment Approach and Methods</b>	<b>Results</b>	<b>Curricular and/or Pedagogical Changes</b>
	<p>and how to deploy them.</p> <p><b>Objective #1</b> The learner will demonstrate the ability to evaluate alternatives and perform risk analysis on that design.</p> <p><b>Objective #2</b> The learner will demonstrate the ability to integrate alternative technologies in that solution.</p> <p><b>Goal</b> To possess a computer science maturity that enables them to read, analyze, and communicate logically and effectively in a professional situation.</p> <p><b>Objective #1</b> The learner will demonstrate the ability to communicate the solution of a problem to colleagues, professionals in their field and to the general public.</p> <p><b>Objective #2</b></p>	<p>Management</p> <p><b>Track 2: Mathematics Minor</b> MATH 235 Analytical Geometry and Calculus II MATH 236 Analytical Geometry and Calculus III MATH 240 Linear Algebra MATH 350 Introduction to Mathematical Statistics MATH 545 Discrete Structures or MATH 354 Differential Equations MATH 665 Numerical Analysis</p> <p><b>Track 3: Geographic Applications Emphasis</b> GSCI 000 Cartography: Theory and Applications GSCI 240 Introduction to Geographic Information Systems</p> <p>GSCI 000 Advanced Geographic Information Systems GSCI 461 Computer Applications GSCI 474 Aerial Photo GSCI 000 Remote Sensing</p> <p><b>Track 4: Physics Emphasis</b> PHYS 211 Physics for Scientists and</p>	<ul style="list-style-type: none"> <li>• Formal and informal student needs assessment</li> <li>• Transcript analysis</li> </ul>		

<b>Characteristics of Computer Science Program</b>	<b>Expected Learning Outcomes</b>	<b>Curriculum</b>	<b>Assessment Approach and Methods</b>	<b>Results</b>	<b>Curricular and/or Pedagogical Changes</b>
	<p>The learner will demonstrate the ability to be able to think logically and make appropriate decisions based on critical thinking.</p> <p><b>Goal</b> To see the political, social, and economic context of a problem.</p> <p><b>Objective #1</b> The learner will demonstrate the ability to be an effective problem solver, using optimization techniques to obtain a best solution.</p> <p><b>Objective #2</b> The learner will demonstrate the ability to be capable of reading undergraduate software engineering, of comprehending the concepts, and of communicating the ideas to others using available technology.</p>	<p>Engineers I PHYS 211L Physics for Scientists and</p> <p>Engineers I Lab MATH 235 Analytical Geometry and Calculus II PHYS 212 Physics for Scientists and Engineers II PHYS 212L Physics for Scientists and</p> <p>Engineers II Lab PHYS 213 Computational Physics PHYS 521 Mechanics</p> <p><b>Track 5: Technology Studies Emphasis</b> TECS 110 Communication Systems TECS 130 Production Systems TECS 200 Engineering Graphics TECS 318 Computer Aided Drafting TECS 430 Computer Aided Manufacturing TECS 560 Training and Instructional Systems TECS 580 Industrial Management TECS 590 Occupational Safety, Health and Liability</p> <p><b>Track 6: Networking Emphasis</b> INT 291 Internetworking I INT 293 Internetworking II INT 680</p>			

Characteristics of <b>Computer Science</b> Program	Expected Learning Outcomes	Curriculum	Assessment Approach and Methods	Results	Curricular and/or Pedagogical Changes
		Networking Architecture and Data Communication I INT 681 Networking Architecture and Data Communication II INT 695 Advanced Routing INT 696 Advanced Remote Access INT 697 Advanced LAN Switching			

**B. Department Staffing Plan**

College of Arts and Sciences  
**Department Staffing Plan and Assignments (Current)**  
 Department of Mathematics and Computer Science  
 Date Completed June 22, 2006

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Current Department Needs	Faculty Member	Current Faculty Expertise	Birthdate	Assigned Instructional FTE's	Rank Current Date	Degree Completed	Track	Current Salary In Line	Nat'l A F Disc R
Analysis Elementary Statistics Statistics Applied	D. Clewett	Applied	NA	.5	Instructor 2006	M.S.	tmp.	18000	
Analysis Computer Science Applied	L. Wang	Applied Computer Science	02/01/1965	1.0	Asst. Prof. 2006	Ph.D.	Tenure Track	44000	
Upper Algebra Teacher Education Liberal Arts Elementary Statistics	W. Weber	Education	07/10/1975	1.0	Instructor 2004	MAT 2001	tmp.	36002	
Upper Algebra Computer Literacy Analysis Computer Science Geometry Elementary Statistics Statistics	R. Sandstrom	Geometry	10/25/1942	.5 (Adm.) .5 (Instructor)	Professor 1987	Ph.D. 1974	Tenured	82598	
Analysis Computer Science Applied	H. Zeng	Applied Computer Science	07/16/1967	1.0	Assistant Professor 2002	Ph.D.	Tenure Track	46107	
Upper Algebra Analysis Geometry Elementary Statistics Statistics Applied	M. Riazi-Kermani	Analysis	11/18/1944	1.0	Professor 1998	Ph.D. 1984	Tenured	66035	
Computer Literacy Teacher Education Liberal Arts Elementary Statistics	M.K. Schippers	General	11/12/1956	.5	Instructor 1998	M.S.	tmp.	23710	

Computer Literacy Teacher Education Liberal Arts Elementary Statistics	K. Dreiling	Education	12/24/1960	1.0	Instructor 1999	M.S./ABD	Tenure Track	38842	
Analysis Teacher Education Elementary Statistics	J. Sadler	Education	09/28/1963	1.0	Instructor 2000	M.S./ABD	Tenure Track	40217	
Computer Literacy Teacher Education Elementary Statistics	L. Young	Education	07/06/1973	1.0	Instructor 2001	MAT/ABD	Tenure Track	36428	
Liberal Arts	M. Zeng	Education	10/16/1965	1.0	Instructor 2001		tmp.	29292	
Computer Literacy	L. Sadler	Computer Literacy	07/14/1957	0	Instructor		tmp.		
Elementary Algebra	P. Luea	General	06/26/1947	0	Instructor		tmp.		

Diversity Ratio = Te

**C. Bibliography of Departmental Scholarly Activity**

Keith Dreiling and Dr. Ron Sandstrom made presentations at KATM Conference in Liberal Arts  
 Dr. Mohammad Riazi made a presentation to “Prairie Mathematics Conference” in Manhattan  
 Keith Dreiling made a presentation to Teaching with Technology in Milwaukee  
 Keith Dreiling made a presentation at Annual NCTM Conference in St. Louis  
 Jeff Sadler made a presentation at Annual NCTM Conference in St. Louis  
 Dr. Hongbiao Zeng made a presentation at the Kansas Section Meeting of MAA in Arkansas City.

Lanee Young mad a presentation to Integrating Mathematics and Science Conference in Dallas  
 Publication of problem submission by Drs. Riazi and Zeng to Collegiate Mathematics Journal

**D. Department Program Assessment Results**

Pre/post/grades College Algebra Spring 2006			
Pretest	0 to 25		
section	sample mean	sample standard deviation	number of students
1	13.60	2.27	15
2	11.60	3.57	15
3	13.28	3.80	25
4	13.05	2.87	19
5	13.00	4.17	19
6	13.20	3.88	20
7	18.73	2.38	11
8	18.00	1.54	11
9	22.11	2.21	18
<b>totals</b>	<b>14.84</b>	<b>4.60</b>	<b>153</b>

Pre/post/grades College Algebra Spring 2006  
 Grades 4-A 3-B 2-C 1-D 0-U

section	sample mean	sample standard deviation	number of students
1	1.80	1.47	15
2	1.67	1.25	15
3	1.80	1.06	25
4	2.58	1.14	19
5	1.79	1.10	19
6	2.15	0.91	20
7	3.36	0.77	11
8	2.27	0.62	11
9	3.28	0.73	18
<b>totals</b>	<b>2.25</b>	<b>1.20</b>	<b>153</b>

Posttest section	Pre/post/grades 0 to 44 sample mean	College Algebra sample standard deviation	Spring 2006 number of students
1	28.80	7.96	15
2	26.07	8.90	15
3	31.24	6.83	25
4	31.79	5.67	19
5	26.68	7.15	19
6	28.15	5.45	20
7	35.18	6.07	11
8	34.82	2.04	11
9	35.72	4.37	18
<b>totals</b>	<b>30.66</b>	<b>7.22</b>	<b>153</b>

Pre/post/grades College Algebra Spring 2006  
 Correlation coefficient between pretest and grades is  
 0.526 with total number of points 153

Correlation coefficient between posttest and grades is  
 0.747 with total number of points 153

Pre/post/grades		College Algebra					Spring 2006
Pretest	0--25	Final		Course		Grade	WD
		A	B	C	D	U	
		25	2	1	0	0	
24	3	1	0	0	0		
23	2	0	0	0	0		
22	2	4	0	0	0		
21	1	1	2	0	0		
20	3	3	0	0	0		
19	0	5	3	1	0		
18	3	2	3	1	0		
17	3	1	8	2	0		
16	5	0	5	2	0		
15	2	1	2	4	0		
14	1	3	1	4	1		
13	3	1	4	2	1		
12	1	1	2	4	2		
11	0	3	5	7	2		
10	0	4	2	3	2		
9	0	0	1	2	0		
8	0	0	2	4	1		
7	0	1	0	1	0		
6	0	0	2	1	0		
5	0	0	1	0	0		
4	0	0	0	0	0		
3	0	0	0	0	0		
2	0	0	0	0	0		
1	0	0	0	0	0		
0	0	0	0	0	0		

Posttest	Pre/post/grades College Algebra Spring 2006					
	0--44					
	Final	Course			Grade	WD
A	B	C	D	U		
44	0	0	0	0	0	
43	4	0	0	1	0	
42	4	0	1	0	0	
41	5	0	0	0	0	
40	3	0	0	0	0	
39	4	2	0	0	0	
38	1	2	0	1	0	
37	4	3	0	0	0	
36	3	3	2	1	0	
35	2	3	2	1	0	
34	0	3	1	0	0	
33	0	2	2	0	0	
32	0	5	3	1	0	
31	0	5	2	2	1	
30	1	2	8	2	0	
29	0	1	2	4	1	
28	0	1	2	3	0	
27	0	0	6	0	0	
26	0	0	2	1	0	
25	0	0	3	4	1	
24	0	0	1	2	0	
23	0	0	2	2	1	
22	0	0	0	4	0	
21	0	0	1	1	1	
20	0	0	2	3	1	
19	0	0	0	1	0	
18	0	0	1	1	1	
17	0	0	0	0	0	
16	0	0	0	2	0	
15	0	0	0	0	0	
14	0	0	0	0	0	
13	0	0	0	0	0	
12	0	0	0	1	1	
11	0	0	0	0	0	
10	0	0	0	0	0	
9	0	0	0	0	1	
8	0	0	0	0	0	
7	0	0	0	0	0	
6	0	0	0	0	0	
5	0	0	0	0	0	

4	0	0	0	0	0
3	0	0	0	0	0
2	0	0	0	0	0
1	0	0	0	0	0
0	0	0	0	0	0
	31	32	43	38	