



KSU ACCESS TO ALGEBRA

Meeting the goals of Senate Bill One through online, on-site College Algebra

Mathematics Remediation in Kentucky

The number of students graduating from Kentucky high schools who require mathematical college remediation is among some of the highest in the nation. Lack of mathematical college readiness has led to low graduation rates for underprepared students pursuing a postsecondary education. One of the leading reasons students fail to complete their postsecondary education is their inability to pass college level mathematics courses. In an effort to reduce the need for postsecondary remediation in mathematics the Kentucky Department of Education (KDE) outlined a Program of Studies in mathematics which requires that all students take a rigorous mathematics course every year they are in high school. The Kentucky State Legislature passed Senate Bill 1 and on March 26, 2009, Governor Beshear signed the bill into law. Senate Bill 1 directly addressed the issue of college readiness by requiring an increase in the rigor and focus of the content of P-12 education, increasing the number of students that are college and career ready. The disciplines of Math and English were specifically identified as content areas of concern.

Goals of Senate Bill 1

- Increase rigor and focus the content of P-12 education.
- Increased communication and professional development between high school and post secondary educators.
- Increase the number of students that are college and career ready.
- Increase the graduation rates of underprepared students entering post secondary institutions.
- Reduce the number of graduating seniors who begin their post secondary education in need of mathematics remediation by 50%.
- Align mathematics course content and assessments between P-12 and postsecondary institutions

Access to Algebra at UK

In 2006, the University of Kentucky implemented a program titled "Access to Algebra." This program was funded by a National Science Foundation (NSF) grant and was designed to offer prepared high school students an opportunity to earn dual credit high school and college algebra credit from UK. Access to Algebra also provided professional development in mathematics for participating Kentucky high school teachers. High school students worked with and primarily interacted with their on-site high school mathematics teachers while faculty at the University of Kentucky assumed the responsibilities of training, professional development and course design. Students were treated as non-degree-seeking students and were enrolled in regularly scheduled sections of college algebra with a UK faculty member as the teacher of record. UK continues to freely provide assistance and the technology for postsecondary institutions that are interested in developing their own programs. A full report on the UK Access to Algebra can be found at:

<https://www.mathclass.org/WebPages/Pages/191/ACCALGO708.pdf>

Access to Algebra at KSU

Together the KDE Program of Studies in mathematics and Senate Bill 1 have created a perfect storm of opportunity for the implementation of an online, on-site, collaboration based college algebra course in the high school curriculum. With the help of Paul Eakin, Ken Kubota, Lee Allen Roher, and Carl Eberhardt, Kentucky State University (KSU) has created an Online College Algebra course modeled after the original Access to Algebra program begun by UK. KSU Access to Algebra is funded by the Office of Regional Stewardship and was developed under the oversight of the mathematics department. KSU's Access to Algebra program is specifically designed to be implemented online in an on-site high school classroom environment as well as for independent study students. The course is constructed, monitored and facilitated by a SACs accredited KSU faculty member. The on-site high school teachers continue to provide direct guidance and assistance to the students.

Online video tutorials are one of the primary teaching tools available to students. Online homework is accessed by students through the Web Homework System created and maintained by UK. There are 3 paper exams and one final exam per semester. KSU faculty and participating teachers meet and grade student exams as a group. This provides inter-reliability in exam scoring. It also gives KSU faculty and high school educators an opportunity to determine which concepts and problems were consistently misunderstood or answered in correctly by students.

Goals of KSU Access to Algebra

- Provide teachers and high school students with a meaningful college credit-bearing course while fulfilling the senior math requirement without increasing the need for SACS accredited instructors.
- Provide a supportive environment for student success by daily access to in-class teacher support and after school programs.
- Provide positive incentives to encourage student enrollment in a college level math course:
 - Students who attempt the course have the opportunity to drop the course with a W as late two weeks before the semester ends.
 - All high school students who have passed Algebra II with a C or higher may enroll as non-degree seeking, dual credit students in KSU's Access to Algebra.
 - By requests of the Office of Regional Stewardship and in light of KSU's land grant status, the administration at KSU has agreed to allow all school districts in the state of Kentucky to be charged the service area dual credit tuition rate for the course of \$105 per semester.
- Improve graduating senior college mathematics readiness by exposing high school teachers and students to college level mathematical content and rigor.
- Increase communication and professional development between high school teachers and university faculty through course content, email, phone contact and weekly/biweekly online meetings.
- Provide important information about Kentucky post secondary mathematics placement policies to superintendents, principals, high school teachers, students and parents before high school graduation.
- Provide encouragement and support for undecided and indifferent students when deciding whether or not to pursue a college education.
- Nullify difficulties due to distance from post secondary institutions which prevent prepared high school seniors from participating in credit bearing college courses.
- Directly expose high school teachers and students to the rigor and content of the college algebra curriculum.

Mathematics placement criteria at KSU

The Kentucky Council on Postsecondary Education (CPE) has identified students with an ACT math subscore of < 22 in need of mathematics remediation. Kentucky State University's placement criteria are very similar to the placement criteria used by other Kentucky public postsecondary colleges and universities.

ACT ≤ 14	Tier 1 Developmental course
15 ≤ ACT ≤ 18	Tier 2 Developmental course
19 ≤ ACT ≤ 21	Tier 3 Developmental course Or credit bearing, college level Liberal Arts course.
ACT ≥ 22	Credit bearing, college level math course
KYOTE Placement Exam	Score dependent

Result from KSU Access to Algebra – Fall 2009

Participating Schools: Franklin County High School, Western Hills High School, Franklin County Educational and Developmental Center and West Jessamine High School

Enrollment: 82 students

ACT math subscore	ACT < 22 Total students 49		ACT ≥ 22 Total students 33		Final Results	
PASS	16	32.65%	21	63.64%	37	45.12%
WITHDRAWAL or FAIL	33	67.35%	12	36.36%	45	54.88%
KYOTE placement results	TBD		TBD			

Implications for students in need of remediation

- **32.65% of the students identified in need of remediation who enrolled in KSU Access to Algebra have successfully completed their college algebra credit.**
- **Upon completion of the KYOTE college algebra placement test, spring 2010, it is hoped that several students identified in need of remediation who received a W or D/F in Access to Algebra, will be able to place into college algebra.**
- **A few students who were undecided about high school graduation plans and successfully passed college algebra have decided to pursue their postsecondary education.**
- **Students with ACT math subscores ≥ 22 who did not pass the college algebra course have been exposed to the college algebra curriculum and should be more prepared to successfully pass college algebra when they pursue their postsecondary education.**
- **In fall of 2010, as part of Access to Algebra, a third tier credit bearing developmental course will be offered as an alternative credit to college algebra. Intermediate Algebra is a direct prerequisite for college algebra and successful completion of this course will allow students with an ACT math subscore < 22 to begin their post graduation college course work in college algebra. Students who find themselves unable to successfully complete college algebra will be allowed to drop back into an online Intermediate Algebra course.**

Access to Algebra – Spring 2010

Participating Schools: Franklin County High School, Western Hills High School, West Jessamine High School, East Jessamine High School and Knott County, Frankfort High School

Enrollment: 111 students