1. **BRIEF EXPLANATION OF PROPOSED CHANGE:**

This course will serve students who would currently place into MAT096 who are not fully prepared for MAT176 (or MAT115). This course would develop college-level study skills and more advanced algebraic problem solving/mathematical critical thinking skills. This course will focus on select algebraic topics that will begin with fundamentals and carry through into application levels. This course (MAT171) is intended for students that are required but under-prepared to take MAT176 or MAT115.

2. **CHECK ITEM(s) BELOW FOR CHANGES DESIRED:**

- [x] New Course(s)
- [ ] Revised Course
- [ ] Course Level (number) Change
- [ ] Other (specify below):

**I. Dean’s Action:**

- [x] Approved
- [ ] Disapproved
- [ ] Returned for Recommended Change

(Signature) ____________________________ Date: 3/2/15

**II. Curriculum Committee Action:**

- [x] Approved
- [ ] Disapproved
- [ ] Returned for Recommended Change

Chairperson: (signature): ____________________________ Date: 3/6/2015

**III. Faculty Senate Action:**

- [x] Approved
- [ ] Disapproved
- [ ] Returned for Recommended Change

Senate President (signature): ____________________________ Date: 3/16/15

Course change proposals and new course proposals approved by the senate are sent to the provost and president of the university as informational items (Faculty Senate Constitution, Article I.B.)

Approved as of 9/29/14

- Kentucky State University is an equal educational and employment opportunity/affirmative action institution
CURRICULUM COMMITTEE
NEW COURSE PROPOSAL

ACADEMIC UNIT: Mathematics

DATE PREPARED: February 23, 2015

PRIMARY AUTHOR(S): April Pilcher

ACADEMIC DISCIPLINE
FACULTY APPROVED: [Signature] 2/27/15
(Committee Chairperson's Signature)

CHAIRPERSON/DEAN
APPROVED: [Signature] 3/2/15
(Chairperson's/Dean Signature)

1. NEW COURSE NUMBER: MAT171

2. NEW COURSE TITLE: Algebraic Concepts

3. CAPSULE STATEMENT OF COURSE CONTENT FOR CATALOG:
Prerequisite: MAT095 with a grade of C or higher or appropriate scores on ACT, SAT, or mathematics placement test. MAT171 is a 3-credit hour course consisting of three hours of regular classroom contact taught by Mathematics Faculty and 2 hours of supplemental math studio contact guided by ACE Instructional Counselors in coordination with the faculty responsible for the course. This course develops algebraic skills through the use of data collection, hands-on manipulatives, and application of algebraic concepts with embedded study skills. Topics include the properties of equality; linear equalities and inequalities, with applications; graphing (linear, quadratic, and exponential growth models), including data collection; rigorous quantitative and qualitative analysis of quadratic functions; and appropriate applications. This course serves as a prerequisite for students whose intended major requires them to complete MAT 115/176.

4. DESCRIPTION OF COURSE CONTENT FOR COURSE SYLLABUS:
MAT171 is a 3-credit hour course consisting of three hours of regular classroom contact taught by Mathematics Faculty and 2 hours of supplemental math studio contact guided by ACE Instructional Counselors in coordination with the faculty responsible for the course. This course serves as a prerequisite for students whose intended major requires them to complete MAT 115/176.
Algebraic Concepts develops the algebraic skills necessary for further studies in mathematics and utilizes manipulatives, group work, and discovery learning with embedded study skills. Topics included in this course:

1. Simplifying expressions with real number operations imbedded
   Simplifying expression with fraction operations imbedded

Final Faculty Senate Approved Form as of 10/4/89
CURRICULUM CHANGE PROPOSAL

ACADEMIC UNIT: __________________________

COURSE NUMBER: __________________________

PAGE 2

- Pedagogy: use manipulatives for introduction then move to symbolic structure.

2. Properties of equality for addition and multiplication.
   - Pedagogy: Students prove through discovery and induction commutative, associative,...
     properties existence and application

3. Linear equations and inequalities with introduction to linear functions.
   - Pedagogy: use manipulatives for introduction then move to symbolic structure.

4. Linear applications: Linear word problems
   - Pedagogy: Student write, solve and critique their own word problems based on articles,
     stories, and examples from their everyday personal experiences.

5. Graphing linear equations
   - Pedagogy: Collect data and use collected data set to teach contextually imbedded - rate
     of change, intercepts, domain and range, function notation, finding linear
     equations/functions and predicting

6. Graphs of quadratic equations
   - Pedagogy: Use graphs of quadratics to compare and contrast to linear equations,
     explore y-intercept, roots, end behavior, vertex etc.)

7. Characteristics of quadratic equations
   - Pedagogy: Use characteristics of quadratic equations to build quadratic equations using
     the factor theorem.

8. Quadratics equations: finding zeros/roots, vertex, intercepts, etc...
   - Pedagogy: Use zeros/roots/vertex/intercepts of quadratic equations to connect
     factoring and the quadratic equation to find the x-intercepts/roots/ of a quadratic.
     Begin contextual applications.
   - Pedagogy: Use factoring connections to introduce the vertex formula. Begin contextual
     max/min application problems.
   - Pedagogy: Solve for the y-intercept using contextual applications.
   - Pedagogy: Use characteristics of quadratics to explore end behavior

9. Solving quadratic equations by completing the square
10. Finding the vertex by completing the square
11. More application problems
12. Quadratic functions: More on functions
13. Functions in the context of exponential growth models, emphasizing: equations, graphs, and
    applications

5. PREREQUISITES:
   15 ≤ ACT Math Subscore ≤ 18
   or SAT Math Subscore ≤ 460
   or a grade of ‘C’ or better in MAT 095
   or a 11 ≤ KYOTE Placement Exam score ≤ 21

6. REQUIRED COURSE: _____ Yes   X_____ No

7. CREDITS: (a) Number ___3___
CURRICULUM CHANGE PROPOSAL
ACADEMIC UNIT: __________________________
COURSE NUMBER: _________________________
PAGE 3

(b) Variable credit Explanation: __________________________

(c) Will course be repeatable for credit: _ Yes _ No

(d) Grading systems permitted: _X_ A-F _ _ P/F _ _ Credit/No Credit
   Exceptions: __________________________

8. Course Level: _X_ Elementary
   ___ Intermediate
   ___ Intermediate/Advanced
   ___ Advanced

9. CROSSLISTING DEPARTMENTS (attach supporting letters):

10. SCHEDULING PLAN: _X_ Each semester
    ___ Annually
    ___ Biennially
    ___ Occasionally

11. STARTING WITH:
    ___ Fall _X_ Spring, ___ Summer: 2016 Academic Year

12. IS THIS A "SPECIAL TOPICS" COURSE? _ Yes _X_ No

13. EXPLANATION OF NEED FOR THE SPECIFIC COURSE:
    Incoming students who will be required to take MAT115 (College Algebra) currently
    have the option to take MAT096 (Beginning Algebra), followed by MAT 176 (Accelerated
    College Algebra), if they do not meet the prerequisites for or placement directly into MAT115.
    As the math department is restructuring the developmental math track, according to CPE
    guidelines and best practices research, developmental courses are currently being phased out of
    the curriculum. MAT171 has been developed not to replace MAT096, but to present more
    advanced algebraic concepts and study skills above and beyond the typical developmental content
    of previous courses. Incoming students with 15≤ACT Math Subscore≤18 may not be prepared for
    success in MAT176. This course will provide the fundamental algebraic skills necessary for
    success in MAT176, while providing students with rigorous quantitative reasoning skills, study
    skills, and hands-on learning.
14. RELATIONSHIP TO OTHER LIKE COURSES IN THE DISCIPLINE/UNIVERSITY:
   This course will provide mathematics-specific study skills and concentrated topics that will
   begin at the basic level and progress through advanced application levels. The skills developed will
   prepare students for success in MAT176 or MAT115.

15. COURSE WHICH MAY BE DROPPED AS A RESULT OF THIS PROPOSAL:
    MAT096 (Beginning Algebra)

16. INSTRUCTIONAL STAFF (if non-faculty, attach Vita):
    Faculty in the unit of Mathematics and Physics and ACE Instructional Counselors. Faculty from the
    unit will have agreed to work closely with ACE Instructional Counselors for any professional
    development needs and studio activity creation and evaluation.

17. COURSE SYLLABUS AND TEXT REFERENCE:
    Attached