MATH 5325: Structure of Number Concepts: Bridging Number to Algebra in Middle School
Summer 2012

I. COURSE INFORMATION
Instructor: Sarah Ives
Schedule: course will meet MTWRF from 11-25 June 2012
Time: 8:30-11:30 AM
Room: CS 107

II. COURSE DESCRIPTION
An in-depth investigation of the real number system, base ten and other number bases, operations and algorithms, divisibility, Euclidean algorithm, congruence, modular arithmetic, and the Fundamental Theorem of Arithmetic, with an emphasis on quantitative and qualitative reasoning. Emphasis will be on the relationship of number and operations to Algebra I concepts. This class is intended for secondary mathematics teachers.

III. PREREQUISITES for the COURSE
Graduate standing; teacher certification or experience teaching mathematics in grades 6-12; and/or permission of the program coordinator.

IV. TEXTS and OTHER SUPPLIES REQUIRED
- The Book of Numbers, Conway & Guy, 1996
- Scientific calculator
- Access to word-processing and spreadsheet software, Microsoft Office preferred
- Regular access to high-speed Internet

V. STUDENT LEARNING OUTCOMES
Upon successful completion of the course, students will:
- Gain a perspective of the historical background of number theory
- Explore other number bases through historical/cultural class presentations
- Calculate and convert between different number bases
- Recognize and work with common subsets of the real numbers
- Write elementary proofs for number theory topics such as divisibility
- Make connections between number and algebra concepts and skills
- Deepen mathematical understandings of connections between 6-12 grade TEKS in number and operation and algebra
- Understand and use theorems and algorithms of number theory

VI. INSTRUCTIONAL METHODS and ACTIVITIES
The course will consist of lecture, collaborative group work, class discussions and class presentations. Students are expected to participate in collaborative groups and whole class discussions by contributing knowledge and thoughtful evaluation of the contribution of others.

VII. EVALUATION and GRADE ASSIGNMENTS

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Participation/Classwork</td>
<td>25%</td>
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<tr>
<td>Homework</td>
<td>25%</td>
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<tr>
<td>Class presentation</td>
<td>25%</td>
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<tr>
<td>Pre/post test</td>
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Classwork – participate in inquiry tasks, whole-class discussion, and group work activities during regularly scheduled class time. Homework may require high speed Internet access and word processing software.

Presentation – select a historical or cultural number system and give a class presentation, comparing and contrasting it to the base ten number system.

Homework -- demonstrate your mastery of select student learning outcomes during individual assessments.

Final exam – complete a comprehensive summative evaluation of your knowledge through a post-test.

VIII. TENTATIVE COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Date</th>
<th>Topics</th>
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<tbody>
<tr>
<td>June 2012</td>
<td>Introduction; pre-test</td>
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<tr>
<td>11</td>
<td>History of ancient mathematics</td>
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<tr>
<td>12</td>
<td>Base 10; face &amp; place value; Other number bases; base 5</td>
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<tr>
<td>13</td>
<td>Real number system; interesting subsets</td>
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<td>14</td>
<td>ME by the Sea conference</td>
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<tr>
<td>15</td>
<td>Prime &amp; composite numbers; Fundamental Theorems of Arithmetic &amp; Algebra; Factors &amp; multiples, factorization</td>
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<td>18</td>
<td>Divisibility; simple proofs; GCF &amp; LCM</td>
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<td>19</td>
<td>Sequences &amp; series</td>
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<td>20</td>
<td>Countable &amp; uncountable sets; Modular arithmetic</td>
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<tr>
<td>21</td>
<td>Irrational numbers; continued fractions</td>
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<tr>
<td>22</td>
<td>Post-test</td>
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Academic Integrity/Plagiarism

University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as
one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a zero grade.

Dropping a Class
I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Friday, 30 March 2012, is the last day to drop a class with an automatic grade of “W” this term [the last day to withdraw from the university is April 30, 2012].

Classroom/professional behavior
Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

Grade Appeals
As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

Disabilities Accommodations
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an
accommodation, please call or visit Disability Services at (361) 825-5816 in Driftwood 101.

Veterans
If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

REFERENCES


