PART I - Course Information

Course Type
☒ Existing/Restructured
☐ New Course Proposed Fall 2013

If new, have you submitted a Form B to the SHSU Curriculum Committee? ☐ Yes ☒ No

Course Prefix & Number: MATH 1332

Texas Common Course Number (TCCN Matrix): MATH 1332

Course Title: College Mathematics

Course Catalog Description (Copy and paste from online catalog for existing courses):
This course is designed to meet the objectives of Component area 2 of the core curriculum for non-business and non-science related majors. Topics may include sets, counting principles, probability, logic, linear algebra, linear programming, mathematics of finance, geometry, and calculus. Applications are emphasized.

Course Prerequisites: THEA score of 270 or its equivalent.

Available Online?
☐ Yes, currently developed in online delivery mode
☐ Anticipated development in online delivery mode (Semester, Year: _____)
☒ No

Number of Sections to be Offered per Academic Year: 24

Estimated Enrollment per Section: 45

Course Level (freshman, sophomore): Freshman

Designated Contact Person (for follow-up communication purposes): Dr. Rebecca García

E-Mail Address: rgarcia@shsu.edu

Phone: 936-294-3520

Approvals

Department Chair: [Signature] 10-22-12 Date

Academic Dean: [Signature] 10/22/12 Date
PART II – THECB Foundational Component Areas

See Appendix for full description of each component area.

Select Component Area: Mathematics

In one paragraph, describe how the proposed course will fulfill the core and skill objectives of the component area: Because quantitative literacy describes a way of thinking rather than a set of topics or a list of skills, the College Mathematics course is a survey of modern theoretical and applied mathematics. A common thread among the array of possible topics is their emphasis on applying mathematical ideas to understanding and solving real-world problems and their focus on communication in the language of mathematics. Students successfully completing this course will be able to identify the mathematical structure within the context of real-world problems, such as those that naturally arise in finance, voting theory and apportionment, graph theory, set theory and logic. In addition, students will apply key mathematical concepts, such as arithmetic, algebra and logic, to understand and solve mathematical problems derived from real-world problems. Students will enhance their creative thinking skills through analyzing, evaluating and deriving mathematical statements from real-world problems. They will refine communication skills by learning to accurately express quantitative data and solutions in written, oral and visual formats. Students will improve their empirical and quantitative skills through their natural exploration of the selected mathematical topics.

PART III – Course Objectives & Student Learning Outcomes (SLO)

Insert the applicable course objectives stated as student learning outcomes (e.g., Students completing the course will be able to...) that support the core component area objectives. Please reference the component rubric for additional information on core component area objectives.

Objective/SLO 1: Students successfully completing this course will gain a greater understanding of the use of mathematical functions in describing natural and physical phenomena, refine pattern recognition skills via generalizations of algebraic techniques, and reformulate real world problems into accurate mathematical expressions. In so doing, students will have increased quantitative literacy in logic patterns and relationships.

How will the objective be addressed (including strategies and techniques)?

Through the topic of finance, students will be exposed to the relationship between the quantitative properties and uses of mathematical functions which arise naturally in this area (exponential and logarithmic functions, polynomial expressions and simple formulas which underlie notions of interest, future and present values of ordinary annuities and compound interest). In addition, through the topic of logic, students will explore different deductive and inductive reasoning, analyze and explore logical connectives and symbolic representations of statements and determine the validity of an argument.
CORE CURRICULUM COMPONENT APPLICATION
Sam Houston State University

Describe how the objective will be assessed: This objective will be assessed through embedded problems in quizzes, exams, and/or in-class worksheets. Instructors will incorporate a common subset of problem types in the final exam of each section. As an example, instructors will be asked to include a question that requires the student to determine and justify the validity of an argument, or to use mathematical formulas to compute the regular monthly payment of a fixed rate mortgage.

Objective/SLO 2: Students successfully completing this course will apply arithmetic, algebraic, and geometric methods to problem solving, in particular the modeling of real-world situations. Emphasis will be placed on accurately representing mathematical information symbolically and graphically, with attention paid to synthesizing the outcomes/solutions both verbally and numerically. In so doing, students will gain a greater understanding of key mathematical concepts.

How will the objective be addressed (including strategies and techniques)?
Through the topic of voting and apportionment, students will develop and explore different systems of voting and develop the concept of fairness. In addition, students will explore various systems of apportionment and discover an analogous concept of fairness in apportionment. Through the topic of graph theory, students will learn its basic concepts and use these theoretical constructs to understand a wide-range of real-world problems in networking, scheduling and discrete dynamical systems.

Describe how the objective will be assessed: This objective will be assessed through embedded problems in quizzes, exams, and/or in-class worksheets. Instructors will incorporate a common subset of problem types in the final exam of each section. As an example, instructors will be asked to include a question that requires the student to determine the outcome of an election using a specified voting method (e.g. instant runoff method), or to determine the most efficient route through a neighborhood using graph theory.

Objective/SLO 3: Students successfully completing this course will solve problems using mathematical concepts, and judge the level of reasonableness of the results. Students will learn to interpret mathematical formulas, graphs and tables and will expand their mathematical reasoning skills to develop sound mathematical arguments.

How will the objective be addressed (including strategies and techniques)?
Through the topic of logic, students will use deductive and inductive reasoning, analyze and explore logical connectives and symbolic representations of statements and determine the validity of an argument. Through the topic of set theory, students will learn to use Venn diagrams to depict relationships between sets and explore various principles underlying the notion of counting, which may be extended to infinite sets.

Describe how the objective will be assessed: This objective will be assessed through embedded problems in quizzes, exams, and/or in-class worksheets. Instructors will incorporate a common subset of problem types in the final exam of each section. As an example, instructors will be asked to include a question that requires the student to use rules of inference to validate an argument, or to use Venn diagrams to analyze results of surveys.

Objective/SLO 4: [Redacted]

How will the objective be addressed (including strategies and techniques)?
[Redacted]

Describe how the objective will be assessed: [Redacted]
Objective/SLO 5: 

How will the objective be addressed (including strategies and techniques)?

Describe how the objective will be assessed:

PART IV – THECB Skill Objectives

Address each of the THECB skill objectives required within the component area. Explain how the skill is addressed, including specific strategies to address the skill(s). Address ALL skill objectives associated with the selected Component Area. (See Appendix)

1. Critical Thinking Skills: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information

How will the skill be addressed (including specific strategies, activities, and techniques)?

Students’ conceptual understanding of the key ideas of mathematics is often accomplished by actively working on assigned problems that illustrate the topic graphically, numerically, symbolically and verbally. This process requires students to think critically about the problems and to evaluate, analyze and synthesize the given information.

The first stage in the development of mathematical and critical thinking is the acquisition of a clear, intuitive picture of the central ideas of a given problem. Next, the student learns to reason with their intuition and explain the reasoning clearly, in plain language. Once this foundation has been laid, students advance their understanding of theoretical constructs and applications applied to other disciplines. Each stage develops the students’ skills from symbolic algebraic manipulation through logic and reasoning, pattern recognition and formulating accurate generalizations of observable phenomena.

2. Communication Skills: to include effective development, interpretation and expression of ideas through written, oral and visual communication

How will the skill be addressed (including specific strategies, activities, and techniques)?

Students will develop their written, oral and visual communication skills as a natural part of the learning mathematics. For example, obtaining a true understanding of the content of combinatorial graphs requires each student working closely with visual representations of graphs and using such visual representations to communicate information about networks and discrete systems through writing and speech. Students are routinely asked to explore and explain a variety of mathematical concepts and applications in writing exercises that challenge students to discuss important concepts such as voting and apportionment methods, analyzing surveys, and validating arguments. In addition, many of the exercises task the student with translating plain language into symbolic mathematical expressions, resolving the problems algebraically, and communicating the results in plain language, either verbally or written.

Improving communication skills could be addressed in one of two ways, either in the form of class presentations or within group work. In those classrooms which implement student presentations, students will be expected to present solutions to several problems to the rest of the class on a regular basis.
Solutions will be presented in both written form (on the board, in front of the room) and orally (explaining methods used and conclusions drawn). Students presenting solutions will receive immediate feedback from those students listening to the presentation.

Those classrooms not having students present their work to their classmates will use group work to address communication skills. On a regular basis (such as during weekly quizzes) the class will be partitioned into small groups of three or four students, and each group will work on either a lengthy problem or on a sequence of problems related to selected topics. The groups will either be assigned by the instructor or formed by the students. Typically each student turns in her own set of solutions, requiring communication among group members, ensuring complete, correct solutions.

3. **Empirical and Quantitative Skills**: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

How will the skill be addressed (including specific strategies, activities, and techniques)?

As a natural part of the curriculum for college mathematics, students must develop skills to manipulate mathematical expressions, analyze numerical data or observable facts to provide accurate and informed conclusions. Early on, multiple representations of the basic functions are stressed: verbal, visual, algebraic and numeric. Students will learn to generate and interpret combinatorial graphs and symbolic formulae as tools for understanding both the quantitative and empirical real-world relationships of functions.

4. **Teamwork**: to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

How will the skill be addressed (including specific strategies, activities, and techniques)?
5. **Personal Responsibility**: to include the ability to connect choices, actions and consequences to ethical decision-making

How will the skill be addressed (including specific strategies, activities, and techniques)?

6. **Social Responsibility**: to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities

How will the skill be addressed (including specific strategies, activities, and techniques)?

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**PART V – SHSU Core Curriculum Committee Requirements**

1. Using a 15-week class schedule, identify the topics to be covered during each week of the semester. Provide sufficient detail to allow readers to understand the scope and sequence of topics covered.

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Deductive and Inductive Reasoning</th>
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<tbody>
<tr>
<td>Week 2</td>
<td>Logical Connectives and Truth Tables</td>
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<td>Week 3</td>
<td>Conditional Statements and Quantifiers</td>
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<td>Week 4</td>
<td>Valid and Invalid Argument</td>
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<td>Week 5</td>
<td>Voting Methods</td>
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<td>Week 6</td>
<td>Apportionment Methods</td>
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<td>Week 7</td>
<td>Fairness in Voting and Flaws of Apportionment</td>
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<td>Week 8</td>
<td>Simple and Compound Interest</td>
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<td>Week 9</td>
<td>Ordinary Annuities</td>
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<td>Week 10</td>
<td>Amortized Loans</td>
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<tr>
<td>Week 11</td>
<td>Terminology of Combinatorial Graphs</td>
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<td>Week 12</td>
<td>Euler and Hamilton Circuits</td>
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<td>Week 13</td>
<td>Networks and Scheduling</td>
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<tr>
<td>Week 14</td>
<td>Sets and Set Operations</td>
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<tr>
<td>Week 15</td>
<td>Applications of Venn Diagrams</td>
</tr>
</tbody>
</table>

2. **Attachments (Syllabus Required)**

- Syllabus Attached?  **Yes**  **No**
- Other Attached?  **Yes**  **No**  If yes, specify:
Appendix: THECB Component Area Descriptions and Skill Requirements

I. Communication (Courses in this category focus on developing ideas and expressing them clearly, considering the effect of the message, fostering understanding, and building the skills needed to communicate persuasively. Courses involve the command of oral, aural, written, and visual literacy skills that enable people to exchange messages appropriate to the subject, occasion, and audience.)

II. Mathematics (Courses in this category focus on quantitative literacy in logic, patterns, and relationships. Courses involve the understanding of key mathematical concepts and the application of appropriate quantitative tools to everyday experience.)

III. Life and Physical Sciences (Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.)

IV. Language, Philosophy, and Culture (Courses in this category focus on how ideas, values, beliefs, and other aspects of culture express and affect human experience. Courses involve the exploration of ideas that foster aesthetic and intellectual creation in order to understand the human condition across cultures.)

V. Creative Arts (Courses in this category focus on the appreciation and analysis of creative artifacts and works of the human imagination. Courses involve the synthesis and interpretation of artistic expression and enable critical, creative, and innovative communication about works of art.)

VI. American History (Courses in this category focus on the consideration of past events and ideas relative to the United States, with the option of including Texas History for a portion of this component area. Courses involve the interaction among individuals, communities, states, the nation, and the world, considering how these interactions have contributed to the development of the United States and its global role.)

VII. Government/Political Science (Courses in this category focus on consideration of the Constitution of the United States and the constitutions of the states, with special emphasis on that of Texas. Courses involve the analysis of governmental institutions, political behavior, civic engagement, and their political and philosophical foundations.)

VIII. Social and Behavioral Sciences (Courses in this category focus on the application of empirical and scientific methods that contribute to the understanding of what makes us human. Courses involve the exploration of behavior and interactions among individuals, groups, institutions, and events, examining their impact on the individual, society, and culture.)

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<tr>
<th>Foundational Component Areas</th>
<th>Skill Objectives</th>
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<tr>
<td></td>
<td>Critical Thinking</td>
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<tr>
<td>Communication</td>
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<tr>
<td>Mathematics</td>
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<td>Life and Physical Sciences</td>
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</tbody>
</table>

Submit completed, signed form to Core Curriculum Committee - Box 2478 or Fax 4-1271
MATH 1332 Course Syllabus
College Mathematics

Location: 
Time and Days: 
Professor: 
Office: 
Telephone: 
e-mail: 
Office hours:

Course Description: This course is designed to meet the objectives of Component Area 2 of the core curriculum for non-business and non-science related majors. Topics may include sets, counting principles, probability, logic, mathematics of finance, geometry, number theory and problem solving techniques. Applications are emphasized. Daily lectures will be given, accompanied by in-class worksheets; daily homework will be assigned; and four exams will be administered throughout the summer session. 3 Credits.

Prerequisite: Two years of high school algebra and high school geometry.

Required Materials: We will be using the following text:

Authors
Book Title, Publishers

It is the responsibility of the student to obtain all course materials by the start of the semester. Scientific calculators are required. Each student must use his/her own calculator. A recommended calculator would be the TI-83 Plus as the text provides tutorials for proper usage. Any comparable scientific calculator would suffice. Each student must bring his/her own writing instrument and notebook.

Course Objectives: Students completing this course will have explored four of the following major concepts. Other techniques and ideas will also be covered.

- Logic
- Sets and Counting
- Finance
- Voting and Apportionment
- Graph Theory

Students successfully completing this course will gain a greater understanding of the use of mathematical functions in describing natural and physical phenomena, refine pattern recognition skills via generalizations of algebraic techniques, and reformulate real world problems into accurate mathematical expressions. In so doing, students will have increased quantitative literacy in logic patterns and relationships.

Students successfully completing this course will apply arithmetic, algebraic, and geometric methods to problem solving, in particular the modeling of real-world situations. Emphasis will be placed on accurately representing mathematical information symbolically and graphically, with attention paid to synthesizing the outcomes/solutions both verbally and numerically. In so doing, students will gain a greater understanding of key mathematical concepts.
Students successfully completing this course will solve problems using mathematical concepts, and judge the level of reasonability of the results. Students will learn to interpret mathematical formulas, graphs and tables and will expand their mathematical reasoning skills to develop sound mathematical arguments.

Students' conceptual understanding of the key ideas of mathematics is often accomplished by actively working on assigned problems that illustrate the topic graphically, numerically, symbolically and verbally. This process requires students to think critically about the problems and to evaluate, analyze and synthesize the given information. Students will develop their written, oral and visual communication skills as a natural part of the learning mathematics. Students will learn to generate and interpret combinatorial graphs and symbolic formulae as tools for understanding both the quantitative and empirical real-world relationships of functions.

**Attendance Policy:** Regular and punctual attendance for this course is mandatory and will be recorded throughout the semester. *More than 5 unexcused and undocumented absences will result in an automatic failure of the course.* Late arrivals or early departures will be considered an absence. The student is responsible for obtaining any assignments or notices given during the date of their absence. For all documentable absences (e.g. hospitalization, court appearances, university athletic conferences, etc...) students must immediately contact and inform the instructor of the situation and present proper documentation before re-entering the classroom.

**Assignments:** Homework will be assigned for every class period. Students are expected to complete the assignment by the due date assigned. They will be made available under the Assignments menu on Blackboard. Periodically, worksheets will be distributed in class and students will be expected and encouraged to work cooperatively on the worksheets and homework. The worksheets and homework will not be collected.

**Exams:** There will be four (4) in-class exams. The final exam will be given on Tuesday, December 11 from 11:00 a.m. to 1:00 p.m. The four exams are tentatively scheduled below.

| Exam 1: | Tuesday, September 18 |
| Exam 2: | Thursday, October 4  |
| Exam 3: | Thursday, October 25 |
| Exam 4: | Tuesday, November 20 |

No make-up exams will be administered. Students must make arrangements with the professor for documentable and excused absences during exam dates before the exam takes place by contacting the professor in person, via email or by telephone.

**Grading:** The four grades will be averaged to determine the final class grade. Thus each exam is worth 25% of the final class grade.

The following is the distribution for each letter grade.

| 90% ≤ A ≤ 100% |
| 80% ≤ B < 90% |
| 70% ≤ C < 80% |
| 60% ≤ D < 70% |
| F < 60% |

**Academic Dishonesty:** All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic ex-
periences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action at the discretion of the instructor. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

**Students with Disabilities:** It is the policy of Sam Houston State University that no otherwise qualified disabled individual shall, solely by reason of his/her handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any academic or Student Life program or activity. Disabled students may request assistance with academically related problems stemming from individual disabilities by contacting the Director of the Counseling Center in the Leo Drain Annex or by calling (936) 294-1720. Please bring all the necessary paperwork to the instructor before the end of the first week of classes in order to proceed with the requested accommodations. All disclosures of disabilities will be kept strictly confidential. NOTE: no accommodation can be made until the student registers with the Counseling Center.

**Classroom Rules of Conduct:** Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. Cellular telephones and pagers must be turned off before class begins and stored away for the duration of the period. Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Multiple offenses will result in an automatic failure of the course and the student will be reported to the Dean of Students for disciplinary action in accordance with university policy.

**Visitors in the Classroom:** All visitors must not present a disruption to the class by their attendance. It is at the professor's discretion whether or not any visitor will be allowed to remain in the classroom.

**Observation of Holy Days:** Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). This request must be made in the first fifteen days of the semester or the first seven days of a summer session in which the absence(s) will occur. The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed.

**Additional Information:** All information on this syllabus is subject to change. Any changes will be announced in class.