Course Description from Common Course Outline including Prerequisites

Ideas in Mathematics explores contemporary topics and applications of mathematics. Topics include problem solving, probability, statistics, financial mathematics, and other selected topics. Students will be exposed to various calculating devices and technological tools used in problem solving. This course is for the Liberal Arts student who is not planning to major in mathematics or the physical sciences.

Prerequisite: MATH 083 or MATH 073

I. Basic Course Information
   A. Robert Koca
   B. F bldg. F410k Essex campus
   C. (443) 840 - 2645
   D. Email address: rkoca@ccbc.edu
   E. Office hours:
      Monday 4 – 5:30
      Tuesday 12:45 – 2:15
      Wed 12:10 – 1:10
      Th. 10 – 11
      Also I will usually be about 10 minutes early to class.
   F. Mathematics Department, Essex: 443-840-2662
   G. Class meeting day(s), time(s) and location(s): Tues and Thurs 11:10am – 12:35pm
   H. Statement of Student Out of Class Work Expectations: This is a three-credit course offered over 14 weeks. You are expected to complete at least 6 hours of work per week outside of the class including reading, class preparation, homework, studying, etc.
   I. Materials:
      2. Calculator: A Scientific Calculator

II. Course Goals Overall
   A. Course objectives as listed on the official Common Course Outline
      Upon completion of this course the students will be able to:
      1. demonstrate a sound understanding of probability values and apply probability rules in order to solve everyday problems relying on probability theory;
      2. apply introductory set theory to solve theoretical and application-based problems;
      3. describe, numerically and graphically, various forms and presentations of statistical data;
      4. apply appropriate statistical measures, dependent upon the nature of specific data, to make informed decisions;
      5. analyze the validity of statistical reports that appear in newspapers, magazines, the internet, and the Web;
      6. apply probability, set theory, and statistics to other academic disciplines;
      7. examine the mathematical contributions made by people from diverse cultures throughout history;
      8. apply appropriate technology to solve mathematical problems;
9. utilize the Internet and other resources to research course-related topics;
10. express mathematical definitions, concepts, and operations using appropriate words, symbols and other means;
11. express concepts of probability, set theory, and statistics using appropriate terminology;
12. apply course-related mathematical theories to appropriate diversity-enriched, reality-based situations;
13. demonstrate the ability to make informed decisions based on consumer financial models;
14. compare the future value of investments based on different compounding rates; and
15. evaluate different payment options to maximize future returns.

B. Major Topics
   I. Sets and Their Applications
      a. Descriptions and definitions
      b. Set operations
      c. Venn diagrams
      d. Problem solving using sets
   II. Financial Mathematics
      a. Simple interest
      b. Compound interest
      c. Annuities
   III. Nature of Probability
      a. Definition
      b. Counting techniques
      c. Conditional probabilities
      d. Odds and mathematical expectations
      e. Problem solving using probability
   IV. Elementary Statistics
      a. Frequency distributions
      b. Descriptive statistics
      c. Normal distribution
      d. Important aspects of statistical design
      e. Problem solving using statistics

C. Rationale
   Covers contemporary topics and applications of mathematics; examines problem solving, probability, statistics, an introduction to computers, and other selected topics. This course is for the Liberal Arts student who is not planning to major in mathematics or the physical sciences.

III. Evaluation

   Quizzes: Total of 18% (drop lowest two)
   Math of Buying a House Project 7%
   Statistics Project 4%
   Probability Project 4%
   Miscellaneous Topics Project 12%
   Exam 1 Consumer Mathematics and Financial Management/Set Theory 20%
Exam 2 Statistics 15%
Exam 3 Counting Methods and Probability 20% (Given during finals week). Scheduled for Tues May 14th 11am – 1pm

Up to an additional 4% can be earned by performance on the non-quiz grade homeworks, class participation, and class attendance. This can be looked at as a chance to show proficiency on the material beyond the quizzes, exams, and projects.

Grade Ranges:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90 – 100%</td>
<td>A</td>
</tr>
<tr>
<td>80 – 89%</td>
<td>B</td>
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<tr>
<td>70 – 79%</td>
<td>C</td>
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<tr>
<td>60 – 69%</td>
<td>D</td>
</tr>
<tr>
<td>Below 60%</td>
<td>F</td>
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</tbody>
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QUizzes: There will be 8-10 quizzes throughout the semester. The in class quizzes will each be short (10-15 minutes), worth 10 points, on material covered recently, possibly open book and or notes, and usually not announced in advance. The lowest two quizzes will be dropped. Quizzes will often be at the end of class but could be given at any time. There will be an optional assignment that can be used to replace a low quiz score.

Projects:
1) Housing
   The first project involves buying a house and looking at the impact of various choices for the length of the loan and of the down payment. A computer program will be used to assist in doing the mathematical calculations. You will comment on the affordability of the house.

2) Statistics
   This project involves applying both computational and graphical techniques to help explain and analyze real life data.

3) Probability
   This project involves applying a wide variety of the techniques from the chapters on counting problems and probability.

4) Miscellaneous
   You will decide on a topic on your own relevant to the course. I will give some suggestions but you can decide on your own as well (but be sure to have me approve it first). The exact requirements will depend on your topic choice but they will all involve a class presentation.

Homework: There will be homework assigned each class usually due for the next class. The homeworks will usually consist of a few “self check” problems either from the text or given on my website faculty.ccbcmd.edu/~rkoca or taken from the website interactmath.com. The self check problems from the text have answers given in the textbook’s appendix and will often be warmup questions or questions not requiring much explanation. The self check problems from the websites will have solutions with comments. The other questions will be denoted as being for handin. These will usually be submitted and returned with corrections and solutions the next class. The HW’s will be marked with a check+, check, or check– but will
not be graded more formally than that. Sometimes the handin problems will be presented on
the board the day they are due instead of being submitted. I may ask for volunteers to present
them or I might call on students randomly. It is also possible that instead of being gone over
individually there will be a question and answer session for them. Unless I say otherwise
 collaboration is allowed on the homeworks but say on which problems whom you worked
with or got assistance from.

EXAMS: The three exams will be on material covered in the previous 3-5 weeks. The exact
dates for the first two exams will be given at least a week in advance. The third exam is during
the finals week and is scheduled for Tuesday May 14th from 11am – 11pm. Each exam will
have a study guide and a practice exam at least one week in advance. There is no curve but
there will be a chance to get some points back by doing corrections for the first two exams.
The third exam will have bonus questions based on the presentations of the miscellaneous
projects.

A. Math Department Attendance policy:
   1. You are expected to attend ALL scheduled classes.
   2. Attendance is critical to student success in college.
   3. Satisfactory attendance is defined to be at most 6 hours of unexcused absences.
   4. Documentation of the reason for your absence(s) may be required.
   5. The instructor may count each unexcused tardy arrival as an absence and each
      unexcused early departure as an absence.

B. Math Department Audit policy:
   Students may change from credit to audit only during the published 50% refund period,
as indicated in the CCBC academic calendar. Students who audit are required to attend
class, participate in course activities, and complete assignments (except for tests and the
final exam) in accordance with instructor guidelines and due dates. For students who do
not meet these requirements, the instructor may change their grade from AU to W.

IV. Course Procedures
   A. Course related policies and procedures
      1) No use of cell phones or other electronic communication devices is allowed
during class time. If you have special circumstances see me individually. If you
         need to borrow a calculator during class let me know.
      2) I am in my office during office hours and no appointment is needed.
         Appointments outside of office hours are also possible.
      3) This is a 3 credit class and you should expect to spend 4 – 8 hours outside of class
         per week. That study time should include a review of the most recent homework
         that has been returned. The quizzes will be on the most recent homeworks and if
         you fix your misunderstandings you can do well on the quizzes even if the
         homeworks are not done perfectly the first try. I think of the homeworks as being
         more for your use than mine for grading purposes.
      4) Unless I say otherwise collaboration is allowed on homeworks. Say in a short note
         whom you worked with (could be a classmate or a tutor). Also realize that you
         may be called on to explain your solution to a homework problem in class.
      5) It is o.k. to do the homework with paper and pencil. Initial subsequent pages
         beyond the first. If it is too messy I will let you know. In particular the combination
of using pen and crossouts should be avoided. If you see yourself doing that either start using pencil with an eraser or rewrite a nicer version.

6) Tutoring is available for free through the student success center. Also in a couple weeks tutoring through the math department is also available. I’ll give a schedule at that time.

7) Some students want to see more examples in class and some students want to see the class examples worked more slowly. Some want both. That is not possible though. But on the class webpage I will post additional practice problems with worked out solutions. Also as you read through the text book you should be working along instead of just reading.

8) Some students say that they can follow the material in class but cannot do it on exams. Realize there is a difference between just reading and following mathematics and doing it yourself. You need to practice working problems on your own. The homework is a chance to make mistakes before it really counts against you grade wise.

B. College wide syllabus policies:

For college wide syllabus policies such as the Code of Conduct related to Academic Integrity and Classroom Behavior or the Audit/ Withdrawal policy, please go to the Syllabus Tab on the MyCCBC page.

C. Contact information for course-related concerns:

Students should first attempt to take concerns to the faculty member. If students are unable to resolve course-related concerns with the instructor, they should contact (name and position of campus coordinator, or other “next level” contact in the event that the instructor IS the coordinator) at (appropriate contact information).

D. Course calendar/schedule:

1. Spring 2013 Academic Calendar:
   http://ccbcmd.edu/registration/spring_collegecal.html
2. Spring 2013 Final Exam Schedule:
   http://ccbcmd.edu/media/registration/finalexams_spring.pdf

This syllabus may be changed with notification to the class.