

**Syllabus:**  
**CS202 Discrete Mathematics and Applications**  
**CS502 Theoretical Foundations of Computer Science**

**Course Number:** CS202/CS502

**Course Title:** Discrete Mathematics and Applications/Theoretical Foundations of Computer Science

**Instructor:** Richard Scherl

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**Class Times:** Mondays 4:30 – 6:20    Thursdays 4:30 – 6:20

**Class Location:** HH 209

**Office Hours:** Mondays 3:00-4:00    Thursdays 3:00-4:00

**Texts:**

**Required** *Discrete Mathematics and Its Applications (Seventh Edition)*, by Kenneth H. Rosen. Boston: McGraw Hill. 2011.

**Recommended** *Student's Solutions Guide to accompany Discrete Mathematics and Its Applications (Seventh Edition)* by Kenneth Rosen , by Jerrold Grossman. Boston: McGraw Hill. 2011.

**Expected Work:** Regular reading assignments, midterms, exercises, quizzes and a final examination.

**Ecampus** All computer-generated overheads and handouts will be put on the ecampus.

**Grading:**

**Final** 30 %

**Midterms** 40 %

**Homeworks** 20 %

## Quizzes 10

**Exam Dates** Midterm dates will be announced soon. The final exam will be given during the regularly scheduled exam period for this course.

**Class Participation:** If you miss a class, it is your responsibility to find out about any announcements made in class, and about the material covered. Similarly you are responsible for all information included in any assignments whether handed out or transmitted online and for all the information in this syllabus. Class participation is strongly encouraged, but you will not be graded for your class participation. Feel free to ask questions. When in doubt, ASK.

**Late Policies:** Homeworks should be handed in on the date due. The deduction for late homeworks is 5% per day up till 1 week late. Late homeworks may not be handed in by email except by special arrangement under special circumstances. They should be handed in to me directly. If you leave them in my mail box or under my door, you should also send me an email saying that you left it. They may also be mailed in by U.S. mail with the postmark date being used as the date handed in. After the one week has ended, late homeworks can be corrected, but will not receive credit as the solutions will have been discussed in class.

**Prerequisites:** For CS202, the prerequisites are Mathematics 109, CS 176. For CS502, the prerequisite is graduate standing.

**Goals of the Course:** To teach students how to think logically and mathematically and to give them the mathematical background needed for further work in computer science.

**Cell Phones:** Off during classes and exams.

**Calculators:** No calculators may be used during the exams. They will not be needed. They may certainly be used for homeworks.

**Exams:** No talking during exams, except to instructor.

**Academic Honesty:** Cheating in this course will not be tolerated. Both the giver and the receiver of information will receive the same penalty. The penalty is likely to be an F in the course and may very well lead to expulsion from Monmouth University. All such cases will be handled as outlined in the *Monmouth University Student Handbook*. Homeworks may NOT be solved in collaboration. You may talk about problems with each other. Where does talking end and cheating start? My rule of thumb is: you may not have a pen/pencil (or keyboard) in your hand while you are talking.

**Special Accommodations** Students needing accommodations are encouraged to see me during office hours or to make a specific appointment to discuss their needs. Students with disabilities who need special accommodations for this class are encouraged to meet with me and/or the appropriate disability service provider on campus as soon as possible. In order to receive accommodations, students must be registered with the appropriate disability service provider on campus as set forth in the student handbook and must follow the University procedure for self-disclosure, which is stated in the University *Guide to Services and Accommodations for Students with Disabilities*. Students will not be afforded any special accommodations for academic work completed prior to the disclosure of the disability and prior to completion of the documentation process with the appropriate disability service office.

**Regrades** All disagreements about grading must be discussed in my office only. A request for an assignment or exam to be regrades must include a written note explaining the disagreement and also the original exam or assignment. These requests may be submitted in class or in my office. Regrade requests for a particular exam or assignment can only be accepted until the next test or assignment is due.

**Course Content** Tentative and subject to change

**Segment 1** Logic

- Propositional Logic
- Quantifiers and Relations
- Inference Rules and Proofs

**Segment 2** Basic Structures

- Sets
- Functions
- Sequences and Sums
- Relations

**Segment 3** Algorithms

- Algorithm Complexity
- Integers
- Number Theory and Applications (as time permits)

**Segment 4** Induction and Recursion

**Segment 5** Counting

- Pigeonhole Principle
- Permutations and Combinations

- Binomial Coefficients (if time permits)
- Recurrence Relations (if time permits)
- Inclusion-Exclusion (if time permits)

**Segment 6** Probability

- Probability Basics (Discrete vs Continuous)
- Bayes' Theorem
- Expected Value and Variance

**Segment 7** Graphs

- Representation and Terminology
- Isomorphism
- Connectivity
- Paths

**Segment 8** Trees

- Tree Terminology
- Tree Traversal

**Segment 9** Modeling Computation (if time permits)

- Languages and Grammars
- Finite-State Machines
- Turing Machines

**Initial Assignment** Begin reading Chapter 1 of text. By next class have 1.1 and 1.2 completed.