Mathematics 2345 — Elements of Discrete Mathematics — Fall 2013

Instructor:	Dr. Nancy Van Cleave	**Office hours**:	2:00 – 2:50 MWF, 3:00–3:50 R & by appt
Office:	Old Main 3311	**Office phone**:	581-5228 (no voice mail)
e-mail:	`nkvancleave@eiu.edu`	**Course Web site**:	`www.eiu.edu/~mathcs`

Prerequisite : Successful completion of MAT1441G (Calc I); some programming in Java may be required for this course.

Text : **Discrete Mathematics and Its Applications, 6th ed.**, by Kenneth Rosen, McGraw-Hill, 2007.

Course Overview : A survey of discrete structures and methods. Includes: logic, proofs, sets, functions, algorithms, recursion, recurrence relations, and Boolean algebra.

Academic Integrity : It is assumed the work you do is your own. However, occasionally it may be necessary to ask someone for help. You are permitted to do so, but you must meet these requirements:

- You **acknowledge** the help received at the top of the paper you are handing in. Be specific. Describe the problem you had, the nature of the help you received, and who helped you.
- You **understand** the solution you turned in. You should be able to explain the reasoning behind any solution for which you received help.

Never copy from another student, nor allow other students to copy your solutions. The Judicial Affairs Office will be used to deal with instances of academic dishonesty and/or plagiarism. Refer to the EIU catalog for further details.

Evaluation : There will be three written exams, homework (possibly including programming assignments and reports), worksheets, weekly quizzes, and a comprehensive final exam for this course. The relative weights of these components are as follows:

Exams	20% each
Worksheets, Quizzes	10%
Final	30%

Course Grade : The following scale will be used as a first approximation to your grade:

90–100: A 80–89: B 70–79: C 60–69: D 0–59: F

In borderline cases, factors such as overall trends and the final exam score will be taken into consideration. It is possible that the cut-off scores given above will be lowered. As a result, an overall score of 80 is *guaranteed* to receive at least a B, whereas a score of 78 *might* result in a B.

Miscellaneous :

- **Make-up exams are available only if agreed upon *before* the regular exam is given. Further, it is your responsibility to provide adequate documentation of the reasons for the delay.** Notify me in advance with a reasonable, verifiable excuse. If you are unable to contact me by phone or email, you can leave a message with the departmental office (581–2028).
- Quizzes cannot be made–up.
- Cell phones and other electronic equipment are to be turned **off**, put away, and out of sight during class. Failure to adhere to this rule will result in expulsion from class, perhaps permanently.
- Ask questions when you experience problems. Ask in class, during my office hours, in email, or make an appointment.

If you have a documented disability and wish to receive academic accommodations, please contact the Coordinator of the Office of Disability Services (581–6583) as soon as possible.

MATHEMATICS 2345 – *Tentative Schedule – Fall 2013*				
WEEK	DATES	READING	TOPICS	NOTES
1	8/19–8/23	1.1-1.4	Logic	8/23 - last day to add
2	8/26–8/30	1.5-1.6	Inference; Proofs	8/30 - last day drop/no grade
3	9/2–9/6	1.7	Proof Methods & Strategy	9/2 - Labor Day - no classes
4	9/9–9/13	2.1-2.3	Sets; Functions	
5	9/16–9/20	2.4, 3.1	Sequences; Algorithms	**Exam 1** – Friday, 9/20
6	9/23–9/27	3.2-3.4	Growth of Functions; Integers	
7	9/30–10/4	3.5-3.7	Primes; Integers (Algorithms)	
8	10/7–10/11	4.1; 5.2	Induction Proofs	10/9 - Midterm 10/11 - Fall Break, no classes
9	10/14–10/18	4.2-4.3	Recursion	**Exam 2** — Friday, 10/18
10	10/21–10/25	4.4-4.5	Recursion; Correctness	
11	10/28–11/1	7.1-7.3	Recurrence Relations	11/1 - last day withdraw W
12	11/4–11/8	11.1-11.3	Boolean Functions; Logic Gates	11/3 - Daylight Savings Time Ends
13	11/11–11/15	11.4	Circuit Minimization	**Exam 3** — Friday, 11/15
14	11/18–11/22	12.1-12.3	Modeling Computation, FSM	
–	11/25–11/29			Thanksgiving Recess, no classes
15	12/2–12/6	12.4-12.5	Languages, Turing Machines	12/6 - last class day
2345	MWF 2:00	**FINAL**	Thursday, 12/12	2:45 – 4:45 pm

Tentative Outline

Week 1:	1.1 Propositional Logic 1.2 Propositional Equivalences 1.3 Predicates and Quantifiers 1.4 Nested Quantifiers
Week 2:	1.5 Rules of Inference 1.6 Introduction to Proofs
Week 3:	1.7 Proof Methods and Strategy
Week 4:	2.1 Sets 2.2 Set Operations 2.3 Functions
Week 5:	2.4 Sequences and Summations 3.1 Algorithms
	Exam 1
Week 6:	3.2 Growth of Functions 3.3 Complexity of Algorithms 3.4 Integers and Division
Week 7:	3.5 Primes and Greatest Common Divisors 3.6 Integers and Algorithms 3.7 Applications of Number Theory
Week 8:	4.1 Mathematical Induction 5.2 The Pigeonhole Principle
Week 9:	4.2 Strong Induction and Well–Ordering 4.3 Recursive Definitions and Structural Induction
	Exam 2
Week 10:	4.4 Recursive Algorithms 4.5 Program Correctness
Week 11:	7.1 Recurrence Relations 7.2 Solving Linear Recurrence Relations 7.3 Divide–and–Conquer Algorithms and Recurrence Relations
Week 12:	11.1 Boolean Functions 11.2 Representing Boolean Functions 11.3 Logic Gates
Week 13:	11.4 Minimization of Circuits
	Exam 3
Week 14:	12.1 Languages and Grammars 12.2 Finite–State Machines with Output 12.3 Finite–State Machines with No Output
Thanksgiving	(Break)
Week 15:	12.4 Language Recognition 12.5 Turning Machines