Course Syllabus for Discrete Math (MAT 4522)

General:

Instructor: Joshua Ruark Office: Wagoner 150

Day/ Time: MWF 1 PM Office Hours: MWF 10-Noon; MW 3-4 PM; R 9-11 AM

Phone Number: 765-285-7421 Email: [jjruark@bsu.edu](mailto:jjruark@bsu.edu)

Text: Epp, *Discrete Mathematics with Applications*; 4th edition; Brooks/Cole; 2011.

Prerequisite: AP Precalculus (EL) or the equivalent.

Description: This course is a survey of discrete mathematical topics selected from among logic, set theory, cardinality of sets, number systems, graph theory, combinatorics, recursion, and discrete probability. This course uses various proof techniques including mathematical induction and stresses algorithmic thinking and precise mathematical expression.

COURSE CONTENT:

Chapter 1 Speaking Mathematically 1.1-1.3

Chapter 2 The Logic of Compound Statements 2.1-2.3

Chapter 3 The Logic of Quantified Statements 3.1-3.4

Chapter 4 Elementary Number Theory and Methods 4.1-4.7

of Proof

Chapter 5 Sequences, Mathematical Induction 5.1-5.3 Chapter 6 Set Theory 6.1-6.3

Chapter 7 Functions 7.1-7.4

Chapter 8 Relations 8.1-8.3

Chapter 9 Counting and Probability 9.1-9.9

Chapter 10 Graphs and Trees 10.1-10.6

Grading:

Grades for the course and assignments are assigned by the following percentages:

100-93 — A 92-90 — A-

89-87 — B+ 86-83 — B 82-80 — B-

79-77 — C+ 76-73 — C 72-70 — C-

<70 — D\*

The final grade in the course will be determined by the following factors:

Homework: 10 %

Quizzes: 10 %

Midterm exams: 60%

Final Exam: 20%

Assignments:

For nearly every section, there will be a homework assignment. Homework will be collected on a regular basis and checked for both completeness and accuracy. Generally, it will be collected two class periods after it is assigned. Expect quizzes on a near weekly basis that will cover material discussed the previous two weeks in class. Depending on the number of quizzes, I will drop up to the lowest three scores from consideration for the overall quiz grade. At the end of each chapter or couple of chapters, there will be a midterm exam covering that material. Finally, at the end of the course, you will have a final exam that will encompass all the material presented during the semester. As the final exam is cumulative, its score will replace any lower midterm exam scores throughout the semester.

Furthermore, I will post a lesson plan for each section covered on the Canvas page for this course. I highly recommend reviewing and printing off the page before you come to each lecture. Additionally, you will find the homework assignment for each section at the bottom of the posted lesson plan. Warning: these lesson plans are meant as a guide to help you in your note taking and should not be considered a substitute for coming to class.

Academic Integrity:

As a firm believer that grades should reflect learning, academic integrity is paramount to the academic experience. Please review the Academy's Academic Integrity policy as it will be strictly adhered to in my class.

Examples of behavior subject to review under the Academic Integrity policy include, but are not limited to:

1, Copying someone's work and turning it in as one's own

2, Use of aids and/or other materials on quizzes and exams without expressed permission.

3, Use of calculators when explicitly forbidden to do so.

4, Copying another person's work or answers on a quiz or exam.

I encourage you to work in groups when doing the homework assignments as much can be learned from your peers that you may not always pick up in class. However, each individual is required to turn in work in their own handwriting accompanied by the requisite work shown to receive full credit.

Technology:

The use of technology is limited to that which will enhance the learning process. Use of laptops is permitted as long as it is not distracting from what is transpiring in the classroom. Calculators, though not required, are welcome to be used for the majority of homework, quiz, and exam assignments. However, there will be instances where calculators are NOT allowed, but you will be informed in advance when these times occur. Additionally, AI may be used on assignments that are not quizzes or exams. However, the purpose of such assignments is help you learn and apply the concepts that are in the content of the course. Please do not let your technology use in all forms detract from this goal.

IA Wireless Device Policy:

Pursuant to Indiana Code 20-26-5-40.7, The Indiana Academy for Science, Mathematics and Humanities prohibits student use of wireless communication devices for non-instructional purposes in the classroom. As such, any and all portable wireless devices, that have the capability to provide voice, messaging, or other data communication between two or more parties, must only be used for academic purposes directly tied to the classroom activity or related educational task. Exceptions to this wireless device policy are eligible through academic accommodations, individualized education programs, or with instructor approval permitting the use of a wireless device for justification related to health, safety, and/or well-being. The improper use of a wireless device in an active classroom setting is subject to disciplinary action including but not limited to; a verbal warning, temporary seizure of said device by a school official, an unexcused absence for the class in question, written communication to parent/guardian, among other elevated consequences for repeated improper use.

Attendance:

Attendance will be taken at the beginning of the hour. You are responsible to be on time for each class period. Arrival within the first 10 minutes of class will constitute a tardy, otherwise you will be marked absent. Failure to attend class will result in disciplinary action as set forth by Academy policy regarding absences and tardies.

Unexcused Absence

It is the policy of the Indiana Academy that any absence from class is unexcused, except for illness, death in the family, college or school-related activities, and extenuating circumstances. When a student is absent from a class, the instructor reports the student absence to the Faculty Attendance Coordinator in the Office of Academic Affairs. Unless the absence is excused by a school official, it is considered unexcused. The decision as to whether an absence is excused is not determined by the instructor.

Any unsubmitted assignment that is due on the day of an unexcused absence is subject to receiving a grade of “0” with no possibility of changing the grade. The only exception is an exam, which will still be recorded as a “0” but may be replaced with a higher percentage attained on the final exam minus ten percent.

Late Work/ Make-up policy:

It is my policy not to accept late work/ allow make-up work unless there is an excused absence the day an assignment is due. Even when absent, you can place the assignment in my mailbox before I leave school for the day and it is still considered on-time. If the absence is excused, it is due the day you return to class. If you know you will be absent the day of a quiz/exam, please let me know ahead of time so we can schedule a time outside of class for you to take the quiz/exam. If the excused absence is unexpected and a retake is not possible, the next exam will cover the quiz grade, and the exam grade will not be entered until the final exam percentage replaces the blank.

Math Mindset:

No matter your opinion on math and your aptitude for it, you can be successful in this class. Everyone doesn’t learn at the same pace, and realizing this, not only do I drop the three lowest quizzes (for when you have a bad day or take a little longer to learn something), I allow the percentage on the cumulative final exam to replace any of the mid-semester exams grades. My philosophy of grades is that if you can demonstrate mastery of the material at the end of the course, you should be rewarded no matter the path taken to get there.

However, the responsibility to learn is yours and yours alone. No one can learn for you, just as no one can breathe, eat, or sleep for you. You may need to work harder for this course than you have in the past, and that is not always easy to do. If you do experience challenges throughout the semester, I recommend one or more of the following strategies to improve your performance:

a—Start your homework as soon as it is assigned. This allows you to find out what help you need, and you can make the most out of the time in class used to answer homework questions.

b—Use whatever resources at your disposal to get the homework turned in complete and correct. This may mean using internet resources or studying with a partner.

c—Reading the lecture notes I post in Canvas, noting the high points that can easily be turned into multiple choice conceptual questions.

d—Retain your tests and quizzes to use as study material for both the mid-term exams and the final exam.

e—Use unassigned homework problems and chapter review problems to simulate possible quiz or exam questions.

f—Seek help early. Take advantage of office hours or inquire about the possibility of an Academy tutor.

g—If there is more than one section of a class, review the board notes from the other section as different lecture examples and homework questions are likely to be there.

h—Have an attitude that expresses a desire to put in the necessary effort to be successful. Plopping down in a chair in my office saying, “I don’t understand this stuff,” shows an attitude unwilling to put forth the effort, while saying, “Can you help me with these specific problems?” does demonstrate that attitude.

Beneficence Pledge:

Ball State University aspires to be a university that attracts and retains outstanding faculty, staff, and students. Ball State is committed to ensuring that all members of the campus community are welcome through our practice of valuing the varied experiences and worldviews of the people whom we serve. We promote a culture of respect and civil discourse as evident in our Beneficence Pledge. As a reflection of Ball State’s commitment to respect, civil discourse, and the Beneficence Pledge, inclusiveness at the Indiana Academy emerges as one of the priorities of our living and learning community. We strive to exist together respectfully and compassionately, creating an environment where every member can thrive.

Schedule

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| Week of | M | W | F |
| 11-Aug | Syllabus/ Sec. 1.1 | Sec. 1.2-1.3 | Sec. 2.1-Q |
| 18-Aug | Sec. 2.2 | Sec. 2.3 | Sec. 3.1-Q |
| 25-Aug | Sec. 3.2 | Sec. 3.3 | Sec. 3.4-Q |
| 1-Sep | No class | Exam Review | Exam 1 |
| 8-Sep | Sec. 4.1 | Sec. 4.2-3 | Sec. 4.4-Q |
| 15-Sep | Sec. 4.5 | Sec. 4.6 | Sec. 4.7-Q |
| 22-Sep | Sec 5.1 | Sec. 5.2-3-Q | Exam Review |
| 29-Sept | Exam 2 | Sec. 6.1 | Sec. 6.2 |
| 6-Oct | No class | No class | Sec. 6.3-Q |
| 13-Oct | Sec. 7.1 | Sec. 7.2 | Sec. 7.3-4-Q |
| 20-Oct | Sec. 8.1 | Sec. 8.2-3-Q | Exam Review |
| 27-Oct | Exam 3 | Sec. 9.1-2 | Sec. 9.3-4 |
| 3-Nov | Sec. 9.5-Q | Sec. 9.6 | Sec. 9.7 |
| 10-Nov | Sec. 9.8-Q | Sec. 9.9 | Sec. 10.1 |
| 17-Nov | Sec. 10.2-Q | Sec. 10.3 | Sec. 10.4 |
| 1-Dec | Sec. 10.5 | Sec. 10.6-Q | Exam Review |
| 8-Dec | Exam 4 | Final Exam Review | Final Exam Review |