


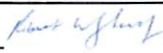


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|  FLORIDA ATLANTIC UNIVERSITY | NEW COURSE PROPOSAL Graduate Programs | | UGPC Approval _____ UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____ | |
| | Department Mathematical Sciences College Science <i>(To obtain a course number, contact erudolph@fau.edu)</i> | | | |
| Prefix MAD Number 6108 | <i>(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)</i> Lab Code | Type of Course Lecture | Course Title Discrete Mathematics for Teachers | |
| Credits <i>(Review Provost Memorandum)</i> 3 | Grading <i>(Select One Option)</i> Regular <input checked="" type="radio"/> Sat/UnSat <input type="radio"/> | Course Description <i>(Syllabus must be attached; see Guidelines)</i> This course provides mathematical background in Discrete Mathematics for high school teachers. Topics include Sets, Logic, Mathematical Induction, Equivalence Relations, Number Theory, Graph Theory, Algorithms, Counting, Recurrence Equations, Generating Functions, Cryptography. This course is not intended for PhD students in mathematics. | | |
| Effective Date <i>(TERM & YEAR)</i> Fall 2019 | Prerequisites Enrollment in Math MST program or permission of instructor | | Corequisites | Registration Controls <i>(Major, College, Level)</i> |
| Prerequisites, Corequisites and Registration Controls are enforced for all sections of course | | | | |
| Minimum qualifications needed to teach course: Member of the FAU graduate faculty and has a terminal degree in the subject area (or a closely related field.) | | List textbook information in syllabus or here Discrete Mathematics for Teachers, by Ed Wheeler and Jim Brawner, Houghton Mifflin 2010. ISBN-13: 978-1617350269 | | |
| Faculty Contact/Email/Phone Stephen C. Locke/ lockes@fau.edu /(561) 297-3350 | | List/Attach comments from departments affected by new course | | |

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|--|--|
| Approved by Department Chair  College Curriculum Chair  College Dean  UGPC Chair _____ UGC Chair _____ Graduate College Dean _____ UFS President _____ Provost _____ | Date 2-26-19 3/11/19 _____ _____ _____ _____ _____ |
| <small>Bob Stackman 2019.03.11 13:47:30 -05'00'</small> | |

Email this form and syllabus to UGPC@fau.edu one week before the UGPC meeting.

GRADUATE COLLEGE

MAR 11 2019

Received

Syllabus

MAD 6108

Discrete Mathematics for Teachers, 3 credits

Text: Discrete Mathematics for Teachers, by Ed Wheeler and Jim Brawner, Houghton Mifflin 2010. ISBN-13: 978-1617350269

Professor: S.C. Locke, SE 237, 561-297-3350, LockeS@fau.edu
Office Hours: TR 3:30 p.m.-4:25 p.m.

Catalog Description. This course provides mathematical background in Discrete Mathematics for high school teachers. Topics include Sets, Logic, Mathematical Induction, Equivalence Relations, Number Theory, Graph Theory, Algorithms, Counting, Recurrence Equations, Generating Functions, Cryptography. This course is not intended for PhD students in mathematics.

Prerequisites: Enrollment in Math MST program or permission of instructor.

Objectives. At the end of the course, students should be able to intelligently discuss topics from Discrete Mathematics, at a level appropriate for conveying the information to high school students. Students should be able to present complete well-reasoned solutions to exercises on the board or via powerpoint or other electronic methods. Students should be able to present material related to the course topics in a coherent fashion.

Assessment: There is no midterm or final exam. 70% of the course grade will be based on online submission of a weekly or biweekly class journal including homework assignments. 20% will be based on a final project/paper. The remaining 10% will be divided between attendance, online forum participation and discussions and short timed quizzes.

Journal/Homework grading will be based on:

- Completeness
- Ease of use, clear organization of submitted material
- Originality and Understanding

Students are encouraged to work in small groups outside of class on homework assignments, but all submissions must clearly reflect the individual's perspective and work.

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Grading Scale: Numerical grades will translate to the following letter grades:

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|---------------|-----|---------|---------|---------|---------|---------|---------|---------|-----|
| % Score Range | <60 | [60,70) | [70,75) | [75,78) | [78,80) | [80,85) | [85,88) | [88,90) | ≥90 |
| Grade | F | D | C | C+ | B- | B | B+ | A- | A |

Assessment Submission and Make-Up Policy: Weekly or biweekly journals and assignments will be submitted as pdf documents along with software specific files (e.g. from Excel, GeoGebra, or Python) via Canvas. Submissions are typically due on the day before the following week's meeting, during which they will be reviewed.

Short timed quizzes (10-30 min) may be included as part of the Canvas/WebEx sessions. These will be downloaded from Canvas during the class, completed on the student's computer, and the results upload to Canvas.

The lowest journal and quiz scores may be dropped in determining the final grade. In exceptional cases with verifiable excuses, alternate make-up assignments will be adapted to particular circumstances.

Note: A grade below C in a graduate course will not usually be counted towards a graduate degree program.

Credit Hour Requirements: To master the material in this course, fifteen weeks of effort are required for a passing grade, with a minimum of nine hours per week including Canvas/WebEx class sessions as well as individual effort.

Attendance: According to FAU Academic Policy, "Students are expected to attend all of their scheduled University Classes and to satisfy all academic objectives as outlined by the instructor". Attendance includes meaningful, active involvement in all class sessions and online class discussions.

Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absence and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

Counseling and Psychological Services (CAPS). Center Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to

consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services - individual counseling, support meetings, and psychiatric services, to name a few - offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>.

Class and Internet Etiquette: Students are expected to exhibit professional, ethical, conduct in all class interactions, whether face-to-face or online. FAU's Academic Policy (<http://www.fau.edu/academic/registrar/FAUcatalog/academics.php>) states that "In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cell phones, are to be disabled in class sessions". Consult <http://www.fau.edu/oit/student/netiquette.php> for the conventions of politeness pertaining to e-mail and technology use.

Disability policy statement. In compliance with the Americans with Disabilities Act (ADA), students who require special accommodation due to a disability to properly execute coursework must register with the Office for Student Accessibility Services (SAS) - in Boca Raton, SU 133 (561-297-3880); in Davie, MOD 1 (954-236-1222); in Jupiter, SR 117 (561-799-8585); or at the Treasure Coast, CO 128 (772-873-3305) - and follow all SAS procedures. The SAS site is <http://www.fau.edu/sas/>.

Honor Code policy statement. Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001 at http://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf.

Proposed Weekly Topics List:

1. Sets, Logic, Cardinality.
2. Mathematical Induction.
3. Relations, Functions, Equivalence Relations, Posets.
4. Matrices (add/multiply), Permutations, Composition of Functions, Cycle Representation of Permutations.
5. Graphs, Directed Graphs, Trees, Euler Trails, Isomorphism.
6. Graph Isomorphism (same/different), Puzzles
7. Number Theory, Modular Arithmetic, Euclidean Algorithm with Certificate (Bezout).
8. Chinese Remainder Theorem, Euler phi-function, Multiplicative Functions
9. Combinations, Permutations, Counting, Recurrence Equations.
10. Generating Functions, Catalan Numbers.

11. Algorithms, Sorting, Order Statistics, Theoretical Machines (e.g. DFA).
12. Graph Algorithm(s): Select from Dijkstra's Algorithm, Kruskal's Algorithm.
13. Inclusion Exclusion, Chromatic Polynomials, Number of Spanning Trees, Determinants, Matrix Tree Theorem (Application of Determinants, Without Proof).
14. Cryptography, Caesar Cipher, Vignere Cipher, and Trap Door Functions.
15. Error-Detecting Codes and Error-Correcting Codes.