THE UNIVERSITY OF TEXAS AT EL PASO
COLLEGE OF SCIENCE
DEPARTMENT OF MATHEMATICAL SCIENCES

Special Topics - 27333 - MATH 5370 – Arithmetic Functions and Applications
Jan. 17, 2023 – May 04, 2023

Hybrid: 50% Online Instructional Method

Face-to-Face: This class meets Face-to-Face on **Wednesday (6:00pm - 7:20pm) in BH130**

Online: The online portion (video-lectures, slides-notes) is **asynchronous via Blackboard**

Instructor:
Dr. Emil Schwab (Professor / Mathematical Sciences / Office: BH 201)
E-mail: eschwab@utep.edu

Office Hours: M/ 4:00 – 5:30 pm and W/ 4:00-4:30 pm in BH 201
E-mai communication: you must use only your UTEP email address.

Textbook / Materials:
Instructor's Lecture Notes

Course Objectives and Content
This course is an introduction to the theory of arithmetic functions and connection with the theory of Fibonacci numbers. In a form accessible to graduate students after a first course in number theory, this course include the following topics:

1. The Ring of Arithmetic Functions via Dirichlet Convolution
2. Multiplicative and Completely Multiplicative Functions
3. Specially Multiplicative Functions
4. Möbius Inversion Formula
5. Fibonacci Specially Multiplicative Functions
6. Binet's Formula in Convolution Setting
7. Busche-Ramanujan Identities for Fibonacci Numbers
8. k- Fibonacci Numbers
9. Fibonacci Möbius Function

This class deepens students' understanding of new concepts/results/ proofs, and students' ability to elaborate research projects in mathematics.

Assignments:
Each student in the course is required to prepare a project containing problems/research questions / homework, regularly assigned during the semester. The project will contain two parts:
Part 1 - Arithmetic Functions
Part 2 - Fibonacci Sequences

Grading Policy:
The final grade will be based on a written test from project / Part 1(50 points possible) and a presentation of project/ Part 2 (50 points possible) respecting the following evaluation rubric for presentation and grading scale:

Evaluation Rubric for Project (part 2) Presentation

Category	Points
Organization (Logical presentation of ideas) Objectives/goals are clearly stated. Methods are appropriate for achieving goals. Results are clearly presented. Thoughts and ideas flow in a logical manner. Results accomplish the purposes of the project.	9-10= Excellent 7-8 = Good 5-6 = Satisfactory ≤ 4 = Poor
Knowledge of Material (Familiarity with subject matter) Exhibits knowledge of subject matter	9-10= Excellent 7-8 = Good 5-6 = Satisfactory ≤ 4 = Poor
Originality and Creativity Theoretical or clinical significance of research Creativity and originality of logic Timeliness and uniqueness of ideas	9-10= Excellent 7-8 = Good 5-6 = Satisfactory ≤ 4 = Poor
Mechanics Neat slides, free of mathematical errors Visual materials are easy to read.	9-10= Excellent 7-8 = Good 5-6 = Satisfactory ≤ 4 = Poor
Delivery Good diction; good articulation Correct, precise pronunciation of terms.	9-10= Excellent 7-8 = Good 5-6 = Satisfactory ≤ 4 = Poor
Total points for project presentation	

Grading Scale (total points: Part 1 + Part 2) :
A: 85-100 points; B: 70-84 points; C: 55-69 points;
D: 40- 54 points; F: 0-40 points

Late Work and Make-up Policy:
Make-up or late work will only be given under extraordinary circumstances, approved by instructor.

Attendance & Withdrawal:
The student may be dropped by the instructor for (excessive absences) 3 or more absences of the face-to-face meetings. It is the student's responsibility to drop the course if desired a grade W, before the drop deadline. The Drop Deadline for this semester is **Mar. 30th , 2023**. No W grade can be given after the drop deadline.

Netiquette/Copyright Statement:
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Scholastic Integrity:
Each student is responsible for notice of and compliance with the provisions of the Regents' Rules and Regulations, which are available for inspection electronically at http://www.utsystem.edu/bor/rules/homepage.htm
Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. To learn more, please visit HOOP: Student Conduct and Discipline.

Disability Statement:
If you need special accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their website at www.sa.utep.edu/cass.

Military Statement:
If you are a military student with the potential of being called to military service and/or training during the course of the semester, you are encouraged to contact the instructor as soon as possible.

COVID – 19 Precautions:
Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you have tested positive for COVID-19, you are encouraged to report to covidaction@utep.edu, so that the Dean of Students Office can provide you with support and help with communication with your professors.