



## **MATH-532-01W Fourier Analysis and Wavelets**

COURSE SYLLABUS: Summer II 2022

### **INSTRUCTOR INFORMATION**

Instructor: **Zhaoting (George) Wei**

Office Location: **H301 (Henderson Hall 3<sup>rd</sup> Floor)**

Office Hours: **MTWTh 2:00pm-3:00pm, on Zoom, or by appointment.** The Zoom information will be sent to you by Email

Office Phone: No office phone yet. It will be provided later, Office Fax: **903-886-5945**

University Email Address: [Zhaoting.wei@tamuc.edu](mailto:Zhaoting.wei@tamuc.edu)

Preferred Form of Communication: **Email**

Communication Response Time: **With 24 hours on weekdays**

Class Meeting Time: Regularly log into our online course. We have Zoom lectures **MTWTh 3:00pm-4:00pm**. The Zoom information will be sent to you by Email.

Class Location: **D2L** under MyLeo, and **Zoom**

### **COURSE INFORMATION**

**Course Description:** The course covers fundamental topics in Fourier Analysis and Wavelets such as Fourier series, Fourier transform, discrete Fourier transforms (DFT and FFT), Haar wavelets, and multiresolution analysis, and applications to signal (sound and image) processing. It is a 100% online course.

**Textbook Required:** A First Course in Wavelets with Fourier Analysis, 2nd edition, by Boggess and Narcowich, published by Wiley, (ISBN-10: 0470431177)

**Pre-requisite:** Math-2414 or the Consent of the instructor.

**Required skills:** A good knowledge of calculus and linear algebra.

#### **Important Dates:**

- Sunday, July 10, 2022, Summer II Last Day to Withdraw (Drop ALL Courses) with 100% Refund
- Monday, July 11, 2022, Summer II First Class Day
- Thursday, July 14, 2022, Summer II Census Date

- Tuesday, July 26, 2022, Summer II Schedules Dropped for Nonpayment
- Thursday, August 11, 2022, Summer II Last Class Day

**Zoom Meeting Time:** **MTWTh 3:00pm-4:00pm**, on Zoom. The Zoom information will be sent to you by Email. I will upload records of all Zoom classes to the course website so that you can watch it yourself if you have time conflicts or if you want to watch it again. There is NO PENALTY for not attending the Zoom meeting.

**Website & Internet:** A Brightspace course website is created for the course which may be accessed from student myLeo accounts. All files and documents, lecture notes and outlines, links to video content, and other material that the instructor shares with the will be posted in the course website. All material posted or shared at the course website is copyrighted ©. You can retain one copy of each file for your personal use, but the files should not be distributed in any form without instructor's written consent. Students will also use the same website for posting all required files and documents in PDF format into the corresponding Submission Folder for each week, including their test papers, homework and project files, excuse notes, and all other documents. E-mail submissions might not be accepted unless legitimate reasons are presented.

**Software & Tools:**

All students' submissions should be in PDF format. Students should have access to a scanner or a scanner app on their cellphone to be able to scan their work into PDF files for all submissions. You can use the following website for scanning course work into PDF files. Remember to make ONE PDF file for each assignment:

- Using CamScanner: <https://www.youtube.com/watch?v=sZFcQJCmtMI>
- Android: <https://www.youtube.com/watch?v=FWIVYd2Zc-E>
- iPhone: <https://www.youtube.com/watch?v=10XH6VfGLqI>

Other file formats are acceptable only in exceptional cases. There are free cellphone apps that are available for scanning papers to PDF files, and commercial versions if preferred are also very affordable.

**Grading:** There is no exams. The final grade will be determined by daily homework:

A = 90%-100%

B = 80%-90%

C = 70%-80%

D = 60%-70%

F < 60%

**Homework:** Homework will be assigned after each lecture online. All assignments of the week will be due by Monday 11:59pm in the following week. The course website keeps a log of the course material that you visit or download. Your attendance score will be based on the content completion points for each lecture calculated by the course website. You should complete all assigned problems, scan your papers as a PDF file, turn your file electronically in form of a PDF file by due dates into the Submission Folder in D2L for that week at the course website. Student

name and homework number should be included in the filename for each week. Selected assignments and problems will be graded, but all problems should be worked out for full homework score. You may work in groups unless otherwise instructed, however **the work you turn in must be your own**. Late work might not be accepted unless legitimate reasons are presented.

**Tentative Course Schedule:** See the end of the syllabus.

**Student Learning Outcomes:** Students who complete this course successfully will

- learn the terminology of Fourier Analysis and Wavelets;
- learn the methods employed in the field of Fourier Analysis and Wavelets;
- learn the applications of theoretical methods to practical problems.

## TECHNOLOGY REQUIREMENTS

### LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:

<https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>

LMS Browser Support:

[https://documentation.brightspace.com/EN/brightspace/requirements/all/browser\\_support.htm](https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm)

YouSeeU Virtual Classroom Requirements:

<https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements>

## ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or [helpdesk@tamuc.edu](mailto:helpdesk@tamuc.edu).

**Note:** Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

## **COMMUNICATION AND SUPPORT**

If you have any questions or are having difficulties with the course material, please contact your Instructor.

### **Technical Support**

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

<https://community.brightspace.com/support/s/contactsupport>

## **COURSE AND UNIVERSITY PROCEDURES/POLICIES**

### **Syllabus Change Policy**

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

### **University Specific Procedures**

#### **Student Conduct**

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](#).

<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: <https://www.britannica.com/topic/netiquette>

#### **TAMUC Attendance**

For more information about the attendance policy please visit the [Attendance Procedure 13.99.99.R0.01](#).

<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.PDF>

#### **Academic Integrity**

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03 Undergraduate Student Academic Dishonesty Form](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/documents/13.99.99.R0.03UndergraduateStudentAcademicDishonestyForm.PDF>

[Graduate Student Academic Dishonesty Form](#)

<http://www.tamuc.edu/academics/graduateschool/faculty/GraduateStudentAcademicDishonestyFormold.PDF>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.PDF>

### **Regarding the University's Pandemic Response**

A&M-Commerce requires the use of face-coverings in all instructional and research classrooms/laboratories. Exceptions may be made by faculty where warranted. Faculty have management over their classrooms. Students not using face-coverings can be required to leave class. Repetitive refusal to comply can be reported to the Office of Students' Rights and Responsibilities as a violation of the student Code of Conduct.

Students should not attend class when ill or after exposure to anyone with a communicable illness. Communicate such instances directly with your instructor. Faculty will work to support the student getting access to missed content or completing missed assignments.

### **Students with Disabilities-- ADA Statement**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

#### **Office of Student Disability Resources and Services**

Texas A&M University-Commerce

Velma K. Waters Library Rm 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: [studentdisabilityservices@tamuc.edu](mailto:studentdisabilityservices@tamuc.edu)

Website: [Office of Student Disability Resources and Services](#)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

## **Nondiscrimination Notice**

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

## **Campus Concealed Carry Statement**

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](#) document and/or consult your event organizer.

Web url:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.PDF>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

### **TENTATIVE COURSE SCHEDULE**

<b>Week</b>	<b>Dates</b>	<b>Topics</b>
<b>1</b>	<b>July 11 – 15</b>	<b>Inner Product Spaces, Fourier Series</b>
<b>2</b>	<b>July 18 – 22</b>	<b>Fourier Transform</b>
<b>3</b>	<b>July 25 – 29</b>	<b>Discrete Fourier Analysis</b>
<b>4</b>	<b>Aug. 1 – 5</b>	<b>Haar Wavelet Analysis</b>
<b>5</b>	<b>Aug. 8 – 12</b>	<b>Multiresolution Analysis, Daubechies Wavelets</b>

