



ECE 439 – Fall 2018

Syllabus for ECE439 – Introduction to DSP – Fall 2018

NOTE: *Your lack of planning/studying is not our emergency.*

1. Course number and name
ECE 439 – Digital Signal Processing for Internet of Things (IoT)
2. Credits and contact hours
Three (3) credit hours.
3. Instructors
Ramiro Jordan, Eric Hamke and Amir Raeisi
4. Additional information:
 - a. Office Locations: ECE 125D, 225B and 223
 - b. Office Hours: To be coordinated via email.
 - c. Class Meeting Day(s): Tuesday and Thursday 14:00 -15:30
 - d. Class Location / Room: ECE 210/215
 - e. Email: rjordan@unm.edu, ehamke@unm.edu, amirorn@unm.edu
 - f. Office Phone: (505) 277-2412
 - g. Lab Time: ECE 210/215
 - h. Term / Semester: Fall 2018
 - i. Final Exam date: TBD
 - j. Software: MATLAB and LabView
5. Text book, title, author, and year
Robert J. Schilling and Sandra L. Harris, Digital Signal Processing using MATLAB, 3rd Edition, Cengage Learning, ISBN 978-1-305-63519-7, 2017, www.cengagebrain.com.

Good reference books, which were used as textbooks for the class, are:
 - 1) John G. Proakis and Dimitris G. Manolakis, Digital Signal Processing: Principles, Algorithms and Applications, 4th Edition, Pearson, ISBN 0-13-187374-1, 2007, www.prenhall.com.
 - 2) Alan V. Oppenheim and Ronald W. Schaffer, Discrete-Time Signal Processing, 3rd Edition, Pearson, ISBN 978-0-13-198842-2, 2010, www.prenhall.com.
 - 3) Digital Signal Processing: A Computer-Based Approach – 3rd Edition; by Sanjit K. Mitra, McGraw Hill, 2006, ISBN 978-0-07-286546-2
 - 4) Digital Signal Processing with Examples in Matlab; by Samuel D. Stearns, CRC Press, 2003, ISBN0-8493-1091-1
 - 5) There are thousands of excellent books and websites on the Internet!!!!



6. Specific course information

Course Catalog Information

Bilateral Z transforms, region of convergence, review of sampling theorem, aliasing, the discrete Fourier transform and properties, analysis/design of FIR/IIR filters, FFT algorithms, spectral analysis using FFT.

Prerequisites

NONE

Additional Information

The class will use a flipped-classroom model where you will be required to study the text, watch video lectures and contents in all formats on the Internet, outside of classroom meeting times. The idea is to reserve classroom meetings for interaction between the instructor and the students. Interaction includes: (i) working on the homework and interactive problem solving, (ii) student project presentations, and (iii) in-class exams (to be discussed). With on-line students we will arrange days and times they can come to ECE for face-to-face interactions, else we will use the phone or SKYPE.

Electronic Files, Quizzes and Exams, Directories and Email for In-class and On-line Students

- The electronic file format accepted for On-line students to submit Quizzes and Exams is **PDF**.
- If in-class students are requested to submit in electronic form, they will follow the same conventions.
- Naming convention: **name-lastname-quiznumber.pdf**
 - Teamwork: use all the last names followed by quiz or exam number
- If you have more than one file then create a directory with all your files and compress it before you email the content. Naming convention: **name-lastname-examnumber.zip**
- All emails to the instructor and TAs must have the tag **ece439**: in the subject field
- All emails will be sent to your UNM account. If you want to forward to another email system then you are responsible for making sure you receive and send emails.
- We will use the Blackboard “learn” email system as well as the UNM system.
- Quizzes and Exams will have an oral component with the instructor.



Semester Project

Students will work on projects. They can work in teams but he/she will be responsible for their own clearly-defined part. In addition, students are responsible for being familiar with the library tools for accessing and gathering information. All presentations in class will be using MS PowerPoint slides; progress reports and final report will be presented in class. The detailed final report will be in MS-Word following UNM-Thesis format.

Grading

Throughout the semester homework will be assigned; in-class and take-home quizzes will be given; in-class Exams will be administered; and finally a project will be assigned, presented and checked out. Each of those learning modules will have a specific number of points. Your goal is to score the maximum number of points; it sets the highest grade in the class!!!!!!!!!!!!

The final grading curve is subject to the discretion of the instructor.

Grading Policies:

Make-up exams are given in extreme cases only. A headache or girl/boyfriend troubles do not fall under this heading. In any event, I need to know about the problem right after your immediate family, within one week. In addition, Make-up exams are more difficult than the regularly scheduled ones, so please avoid them when you can. I will be covering the material at two to three times the pace of most of your undergraduate classes, and will expect you to acquire the ability of applying what you learn to new situations. It is your responsibility to learn the material even if it were not completely covered in the lectures. You should read the material in your textbook before it is covered in class as often as possible. It is often useful to read with pencil and paper and try to comprehend the material at your own pace. Finally, your test problems will not be like the homework problems because I am here to teach you not to help you cheat on the exam.

Please understand that my job is to teach you and not to grade you. Also, I do not give out grades; I merely tell UNM what you earn. In order to simplify my life and yours, try talking to me, as soon as possible, about any special circumstances and concerns you have about your performance. Finally, I hope that you will enjoy the material in this course, and more importantly that you will learn it.

We will not assign extra credit/makeup homework assignments or quizzes so that you can improve your score. Lastly, grades are nonnegotiable!



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Class Goals

This course provides an introduction to Digital Signal Processing. Students will learn the necessary mathematical background to develop and carry out DSP algorithms. Students will design and implement a project that will be presented at the end of the semester.

Website

learn.unm.edu – all the material will be posted here: homeworks, quizzes, exams, notes, slides, code, etc.

Attendance Policy

Regular and punctual attendance is required. UNM Pathfinder policies apply, which in part means instructor drops based on non-attendance are possible. This policy applies regardless of the grading option you have chosen.

Special Circumstances

The instructor should be notified as early as possible regarding any special conditions or circumstances which may affect a student's performance during the course timeframe (e.g., medical emergencies, family circumstances, etc).

Academic Integrity: Dishonesty in Academic Matters

Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The university reserves the right to take disciplinary action, including dismissal, against any student who is found responsible for academic dishonesty or who otherwise fails to meet the standards. Any student who has been judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course.

Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests, or assignments (including programming assignments); claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or outside the university; and nondisclosure or misrepresentation in filling out applications or other university records.

The University of New Mexico believes that academic honesty is a foundation principle for personal and academic development. All University policies regarding academic honesty apply to this course. Academic dishonesty includes, but is not limited to, cheating or copying, plagiarism (claiming credit for the words or works of another from any type of source such as print, Internet or electronic database, or failing to cite the source), fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. The University's



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full statement on academic honesty and the consequences for failure to comply is available in the college catalog and in the *Pathfinder*.

Calculators

The use of basic electronic calculators is generally permitted on tests.

Tardiness

Try to arrive on time to class. If you arrive late, you are disrupting the learning environment for everyone. If you arrive late on the day of a quiz or exam, and the first person to finish has already left the classroom, you will not be permitted to begin the quiz or exam.

A few words on pagers and cell phones

OK- we all (mostly) have “smart” cell phones. However, a classroom is a learning environment. A ringing cell phone or beeping pager going off during a lecture is disruptive to other students as well as the instructor. If you must bring a beeper or cell phone to class, set it to vibrate (not ring) and leave the classroom discretely to answer your phone or to return the page. If you cannot set your phone or pager to vibrate- turn it off during class! If your cell phone or pager rings during lecture, you will be asked to leave. Turn your cell phone or pager off during exams and quizzes!! If you answer your phone or leave the room for any reason during an exam or quiz, you will not be allowed to finish!

As a matter of courtesy, please turn off cell phones, pagers, and other communication and entertainment devices prior to the beginning of class. Notify me in advance if you are monitoring an emergency, for which cell phone ringers should be switched to vibrate.

Reasonable Accommodation

The university makes reasonable accommodation to the religious observances/national origin practices of a student and to the known physical or mental limitations of a qualified student or program user with a disability, unless such accommodations have the end result of fundamentally altering a program or service or placing an undue hardship on the operation of the university. Qualified students or program users with disabilities should contact the Office of Equal Opportunity or the Student Support Services for information regarding accommodations. The University of New Mexico is committed to the recognition and the proactive pursuit of compliance with the Americans with Disabilities Act of 1990 (ADA).

Accessibility Services (Mesa Vista Hall 2021, 277-3506) provides academic support to students who have disabilities. If you think you need alternative accessible formats for undertaking and completing coursework, you should contact this service right away to assure your needs are met in a timely manner. If you need local assistance in contacting Accessibility Services, see the Bachelor and Graduate Programs office.



Library and Tutorial Services [Click here to enter text.](#)

UNM-Main campus provides many library services and some tutorial services for distance students. For library services, go to <http://www.unm.edu/libraries/> to link to a specific library or to contact a librarian. For tutorial services, go to <http://caps.unm.edu/online> to explore UNM's online services.

UNM Copyright Policy and Law

**University Counsel's Office
Subject to Change Without Notice**

The unauthorized distribution of copyrighted material, including through peer-to-peer file sharing, may subject a student to criminal and civil penalties. The laws that govern copyright are not specific to any one technology. Students can violate the rights of a copyright holder using many different types of technology. Both uploading and downloading of files can pose a violation of the copyright law. Students should be cautious when obtaining any copyrighted material. As a rule of thumb, before a student receives anything for free, they should research whether that source provides material licensed by the copyright owner. A group called EDUCAUSE has a list of legal file sharing alternatives at <http://www.educause.edu/legalcontent>.

Individuals who violate copyright law by illegally uploading and downloading copyrighted files may be subject to civil penalties of between \$750 and \$150,000 per song. These penalties are established by federal law. In the past, pre-litigation settlements offered by copyright owners have been in the \$3,000 to \$4,000 and up range while juries in some jurisdictions have issued verdicts of hundreds of thousands and up. In addition, a court may, in its discretion, grant the copyright owner reasonable attorney fees. Although criminal prosecution of students for file sharing is extremely rare, federal law lays out criminal penalties for intentional copyright infringement which can include fines and jail time. In addition to potentially violating the law, unauthorized distribution or receipt of copyrighted material is a violation of University Business Policies and Procedures Manual 2500. That policy states that: "Users shall respect all copyrights including software copyrights...Use of University computing services in violation of applicable laws or University policy may result in sanctions, including withdrawal of use privilege; disciplinary action, up to and including, expulsion from the University or discharge from a position; and legal prosecution under applicable federal and/or state law."