Class Meeting Information
Day and Time: Tuesday and Thursday, 12-1:15 pm
Location: Exploratory Hall, Room L102

Instructor Information
Instructor: Dr. Jill K. Nelson
Office: 3216 Engineering Building
Phone: 703-993-1598
Email Address: jnelson@gmu.edu
Office Hours: Tuesdays, 2 – 4 pm
Other times by appointment

Teaching Assistant Information
German Borda – Graduate teaching assistant
Email Address: g borda@masonlive.gmu.edu
Office Hours: Mondays from 1:30 pm to 3:30 pm in ENGR 3204

Abdul Arif – Undergraduate learning assistant
Email Address: aarif4@masonlive.gmu.edu

Kyler Sparks – Undergraduate learning assistant
Email Address: ksparks3@masonlive.gmu.edu

Course Website
http://gmu.blackboard.com

The course website is located within Blackboard. You can log into Blackboard using the same login name and password you use to log into your Mason email account. You need to be registered for the course in order to access the course website. Reading assignments, homework assignments, projects, solutions, announcements, and any miscellaneous handouts will be posted on the website. Please check it frequently for updates.

Required Textbook

Other Required Materials
- I>clicker 2 – http://www.iclicker.com
- A set of white-board dry-erase markers, EXPO brand

Prerequisites
- ECE 220 – Grade of C or better
- MATH 203 – Grade of C or better
- This class also assumes you are fluent in MATLAB. If your MATLAB background is weak, you will need to review the MATLAB content from ECE 201 and ECE 220.
Course Topics
- Discrete-time signals and properties of discrete-time systems
- Discrete-time convolution
- Discrete-time Fourier series
- Discrete-time Fourier transform
- The z-transform
- Frequency response and LTI system analysis
- Sampling and reconstruction
- Discrete Fourier transform
- Discrete-time filters

Students as Scholars Learning Outcomes
In addition to content-specific objectives, this course is also designed to engage students in scholarship within the discipline of electrical and computer engineering. The course is designated as a Scholarly Inquiry Course. As part of the course, students will articulate and refine an engineering problem, follow professional ethical principles during the inquiry process, gather scientific evidence related to the engineering problem, and situate the engineering problem within a broader engineering context. More information about Mason’s Students as Scholars program can be found at http://oscar.gmu.edu/fac-staff/rs-courses.cfm.

Preparation for Class
You are expected to prepare for each class. This includes reviewing previously covered material, as well as completing the assigned reading. As you progress in your career as an engineer, it is essential that you acquire the skill of reading a book to learn necessary information about a technical problem. In your professional life, you will have to solve many problems that are not taught in classes here, and engineering textbooks or journals will be your only resource. The assigned reading associated with each class period will be posted on the course website. You are expected to complete the assigned reading before coming to class. You will need material in the reading, as well as material from previous class periods, in order to successfully complete problems assigned in class.

To motivate you to prepare for class, each class period will begin with a short Readiness Assessment Test (RAT). The RATs will be completed independently (no collaboration). Your grade on these RATs will be 5% of your final grade for the class.

Class Format
This is not a lecture course. Students in this class will engage in active learning, which will require preparation before class begins, engaged class participation, and hands-on work. Because effective learning is an active, collaborative process, class periods will involve significant learning by doing. Educational research has shown that active participation in class improves learning and retention.

This class is being held in the ALT (Active Learning Tech) classroom, which has 8 circular tables. You will be assigned to a group for in-class activities, and your group will be assigned to a table. In-class problems will give you a chance to apply the material you have learned from your reading and from any short lecture elements. Some responses to in-class problems will be submitted via i>clicker and others via paper or via photographs of white-board work. Class sessions will often include a warm-up/review problem focused on the assigned reading and/or material from the previous class session.

You are expected to attend every class, arrive on time, remain the entire period, come prepared, and be constructively and respectfully engaged while you are here. If you are not present, you are responsible for the material covered during the class and for obtaining notes from another student. Additionally, you are responsible for turning in any assignments due at the beginning of the class period.
All alarms, ringers, etc., must be turned off during class. Using your laptop or mobile device for something other than ECE 320 work is considered a distraction to the instructor and is disrespectful to the other members of your group. Students engaging in non class-focused activities will be asked to leave the classroom.

**i>clickers**
This course will use i>clickers, a classroom response system, to facilitate the RATs and some in-class problems. The i>clicker system provides immediate feedback about overall class understanding, which can lead to class discussion to clarify misconceptions and common mistakes.

You are expected to purchase, or have purchased, an i>clicker 2 device for use in this course. To learn more about the i>clicker 2, please visit the i>clicker website at [http://www.iclicker.com](http://www.iclicker.com).

You must register your i>clicker 2 device online at [https://www1.iclicker.com/register-clicker/](https://www1.iclicker.com/register-clicker/).

Important information when registering your i>clicker:
- GMU uses a Learning Management System (Blackboard).
- Your student ID is the prefix of your email address.

Guidelines for i>clicker use:
- You must register your i>clicker in order to use it in this course.
- You must bring your i>clicker to every class. If you do not bring your i>clicker to class, you will not receive credit for the RAT or in-class exercises during that class session.
- You may use **only** your i>clicker and no one else's. If you are caught using more than one i>clicker, all of them will be confiscated for the duration of class, and you will receive a 0 for all in-class exercises. Only your i>clicker will be returned at the end of class.

**Homework Assignments**
Homework assignments will be given approximately weekly throughout the course and will be posted on the course website. The assignment due dates will be given in the assignments. No late homework assignments will be accepted. Solutions will be posted on the course website. The lowest homework grade will be dropped when computing each student’s overall homework score.

Homework submissions should be written neatly. Pages should be stapled, and problems should appear in order. I reserve the right to return problem sets ungraded if they don’t meet these requirements.

You are encouraged to work in groups and discuss the assigned problems. However, the work you turn in should be your own. You must write up your own solutions for the homework problems. If you use material from other sources such as, but not limited to, the web, books, journals, etc., you must reference the source. Copying (including copying existing solutions) or other forms of cheating will be reported to the Honor Committee. Note that you are responsible for all material on the homework via in-class problems and exams.

**Projects**
Two MATLAB projects will be assigned during the course. The assignment and due dates will be posted on the course website. No late projects will be accepted without prior permission of the instructor. Copying or other forms of cheating will be reported to the Honor Committee.

Project submissions must be organized and professional. All plots must be fully labeled. Work that is disorganized or unreadable will be returned ungraded, and no credit will be given. Some projects will require use of the Signal Processing Toolbox for MATLAB, which is available on the PCs in the ECE and VSE labs.
Exams
The course will include two mid-term exams and one final exam. The dates for these exams are given below:
Midterm Exam 1: Tuesday, February 23
Midterm Exam 2: Tuesday, April 5
Final Exam: Thursday, May 5, 10:30 am - 1:15 pm

Each of the mid-term exams will focus on the material that has been covered since the previous exam. However, much of the material in the course builds on the material that is covered before it. Hence, even though the in-class exams are not explicitly cumulative, they will require an understanding of the basic material on which the tested material builds. The final exam will be cumulative, explicitly evaluating your understanding of all material covered in this course.

All exams will be closed book and closed notes unless otherwise stated by the instructor. Absolutely no collaboration is allowed on exams.

Grading
Your final score will be based on a weighted combination of your scores on RATs, in-class problems, homework assignments, projects, and exams as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Mid-term 1</td>
<td>20%</td>
</tr>
<tr>
<td>Mid-term 2</td>
<td>20%</td>
</tr>
<tr>
<td>MATLAB Projects</td>
<td>16%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
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<tr>
<td>In-Class Problems</td>
<td>7% (lowest score will be dropped)</td>
</tr>
<tr>
<td>Readiness Assessment Tests (RATs)</td>
<td>5% (lowest score will be dropped)</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>7% (lowest score will be dropped)</td>
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</tbody>
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A request for a grade change for any assignment must be provided to the instructor within two class periods after the assignment is returned. The request must include the graded assignment in question and a written statement describing why a grade change is requested. The instructor or grader will re-grade the assignment. Note that your score may be either increased or reduced (or remain unchanged) in a re-grade.

Honor Code
Mason is an Honor Code university. The principle of academic integrity is taken very seriously and violations are treated gravely. Three fundamental principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification.

No grade is important enough to justify academic misconduct. Plagiarism means using the exact words, opinions, factual information, graphs or figures from another person without giving the person credit. Writers give credit through accepted documentation styles, such as parenthetical citation, footnotes, or endnotes. Note that paraphrased material must also be cited. A simple listing of books or articles is not sufficient. Plagiarism is the equivalent of intellectual robbery and cannot be tolerated in the academic setting. If you have any doubts about what constitutes plagiarism, please see me.

All students are expected to abide by the George Mason University Honor Code. Any reasonable suspicion of an honor code violation will be reported. You must review the rules of the Mason Honor Code and be familiar with them. The Mason Honor Code can be found at: http://oai.gmu.edu/the-mason-honor-code-2/.
Reposting of Course Material to Other Websites
The course materials (lecture notes, homework assignments, projects, exams, solutions, and anything else posted on the course website) are copyrighted. You may not upload them to any other website or share them with any on-line or off-line test bank.

Office of Disability Services (ODS)
If you are a student with a disability and require special accommodations, please contact me and the Office of Disability Services (ODS) as soon as possible. All special accommodations must be arranged through ODS.

Office of Disability Services (ODS): 703-993-2474; http://ods.gmu.edu

Other Useful Campus Resources
- Writing Center: A114 Robinson Hall; 703-993-1200; http://writingcenter.gmu.edu
- University Libraries: “Ask a Librarian” http://library.gmu.edu/ask
- Counseling and Psychological Services (CAPS): 703-993-2380; http://caps.gmu.edu
- The University Catalog: http://catalog.gmu.edu
- University Policies: http://universitypolicy.gmu.edu

Tentative Weekly Schedule
Week 1 – Introduction, overview, CT signals and systems review
Week 2 – DT signals and systems, convolution
Week 3 – Properties of DT LTI systems
Week 4 – DT Fourier series (DTFS)
Week 5 – DT Fourier series, DT Fourier transform (DTFT)
Week 6 – DT Fourier transform
Week 7 – The z-transform
Week 8 – Frequency domain analysis of LTI systems
Week 9 – Sampling and reconstruction
Week 10 – DT processing of CT signals
Week 11 – Discrete Fourier transform (DFT)
Week 12 – Finite impulse response (FIR) filters
Week 13 – Infinite impulse response (IIR) filters
Week 14 – Applications and Special Topics