

New York City College of Technology
Department of Computer Engineering Technology

EMT 2461 – Electromechanical Systems: Software Interface

URL: www.citytechrobotics.org/EMT2461.htm

- Instructor:** Dr. X. Li
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Office: V642, Tel: 718-260-5885
Office Hours: TBA on course website
- Course Objectives:** An introduction to the concepts and techniques of using computer hardware and electromechanical systems to control external devices, both electrically and mechanically. Students build a project to learn the interface of software and hardware for use as a control element.
- Credit Hours:** 2 credits with 1 class hour and 2 lab hours
- Prerequisites:** EMT 1111 and EMT 2370
- Pre- or Co-requisites:** EMT 2455, EMT 2480L and MAT 1475
- Textbook:** No textbook is required for this course. However, students are recommended to use the reference materials indicated in the References Section.
- References:** Brian Evans, *Beginning Arduino Programming*, Apress, ISBN: 978-1-4302-3777-8, 2011.
McRoberts, Michael, *Beginning Arduino*, Apress, ISBN: 978-1-4302-3240-7, 2010.
Banzi, Massimo, *Getting Started with Arduino*, 1st Edition, OReilly, ISBN: 978-0-596-15551-3, 2009.
Christopher T. Kilian, *Modern Control Technology*, 3rd Edition, Delmar Cengage Learning, ISBN: 1401858066, 2006.
Ron Mancini, *Op Amps For Everyone: Design Reference*, Advanced Analog Products Division of Texas Instruments, 2002.
- Additional reference notes and materials will be provided in the class.

Softwares for Lab/Project: A few free or open-source softwares will be used in the labs and course project. The links to download the softwares will be posted on the Blackboard.

Grading Policy:	Attendance	10%
	Labs & Quizzes	25%
	Midterm Project Proposal	15%
	Project Report	15%
	Final Project & Extra Credits	35%

- Attendance:**
- Under CUNY mandate, attendance in each class is required.
 - At the beginning of each class, the instructor will make a roll call of all the student names to check the attendance. Any lateness **MUST** be reported to the instructor by the students before the class is dismissed. A name without on-time attendance nor reported lateness will be considered as **absence**.
 - 2 lateness will be considered equally as a absence.
 - Final attendance score without any lateness nor absence record will be 100. Each lateness will lead to 15 point loss, and each absence will lead to 30 point loss in the final attendance score until the attendance score hits zero.
 - Being absent for more than **3 times** or being late for more than **6 times** in a semester, a **WU** or **F** grade will be granted during or after the semester.
 - Any absence due to emergencies (e.g., emergency medical condition or no-fault legal crisis) needs to be notified to the instructor. Excused absences can **ONLY** be considered with signed explanatory notes from proper party with proper authority.

- Lab Reports:**
- Lab reports must be submitted **INDIVIDUALLY**.
 - All lab reports have to be submitted through Blackboard.
 - Any late-due lab report will have **zero** grade.
 - Additional requirement on lab reports is posted on Blackboard. Please read it carefully.

- Quizzes and Exams:**
- Quizzes will be given at the beginning of a class. They will cover the previous lectures.
 - Quizzes and exams will have **NO** any make-up. Please be present and on time!
 - All quiz scores will be equally contributed to your final grade.

**Course
Project:**

- 3 students (maximum) make up a team to finish the course project.
- The project should include mechanical, electrical and software components.
- Each team propose a course project (by the midterm, a project proposal has to be submitted). The proposal should clearly define the desired task or project objective.
- Each team will have **15 minutes** to demonstrate the project and **10 minutes** to make a presentation on the final exam day. Any circuit schematic and programming code used for the project need to be presented. Team members will be interviewed for individual scores.
- The final project demonstration is scheduled in the final week.
- See separate handouts for more details on the project.

**Project
Proposal and
Report:**

- Each team needs to submit a Midterm Project Proposal and a Project Report in the semester.
- The grades of the proposal and report will be determined by the content completeness, technical soundness and presentation professionalism. Detailed requirements on the content and format will be posted on the Blackboard. Please read them carefully.

Extra Credits:

- Extra Credits may be offered for certain other additional work or performance that are related to the class, such as extra homework or expanded project.
- All extra credits will be counted with your final project score.

**Learning
Outcomes:**

Upon successful completion of this course, the student will be able to:

1. Demonstrate knowledge, techniques, and skills in the design and development of an electromechanical system;
2. Demonstrate the ability of self-directed project proposing and concept developing;
3. Demonstrate knowledge in selecting mechanical, electrical, and computer software components and materials for develop an electromechanical system;
4. Be familiar with using computer software and hardware tool to integrate the componets for developing an electromechanical system;
5. Be familiar with tools and instruments in testing and troubleshooting hardware and software componet and subsystems while following relevant safety procedures;
6. Utilize mathematics and science in support of electromechanical system design;

7. Function as a team member or leader and to communicate effectively orally and in writing;
8. Create a project management plan and follow the timelines for a quality and timely project development;
9. Understand the importance of professionalism and engineering ethics.

Conduct Code: Cell phone ringing and any other distracting and disruptive behavior such as talk loudly without permission are absolutely prohibited and may cause yourself being expelled from the class. Any activity that threatens the college academic integrity will result in a disciplinary action. Please refer to the Student Handbook and the Catalog of New York City College of Technology for a full listing of Student Code of Conduct, Classroom Behavior Guidelines and Academic Integrity Rules.

Library Usage: Students are encouraged to use the library for supplementary resources of the lectures.

Class Success Tips: 1). **Study in groups!** Studies have shown that students who study in a group perform better than alone. So find your study buddies!

2). **Take complete notes** during lectures and review them thoroughly before you forget.

3). **Do the lab**, do not only stand aside to watch your teammate doing the lab. Be prepared for the pop-up quizzes, and seek help immediately for any difficulty. Don't wait until the night before the test or the due date of the homework.

4). Speak up if you have questions or concerns, be it in class, during office hours, or via email.

5). Work through the example problems step by step and try some related problems.

6). Don't assume every concept can be crystal clear to you just after a single reading. More than one reading of the material will be necessary.

7). Use Wikipedia and the references therein, instead of Google, as the first stop when you do research.

8). Students who are failing in the course may consider officially withdrawing on or before the Withdrawal Date to avoid an 'F' or 'WU' grade.

9). Use the tutoring service and other assistances provided by the college: **Tech Learning Center (V-217)**, **Student Support Services (A-237)**, **The Counseling Center (N-108)**.

9). **Make extra credits!** A variety of opportunities to make extra

credits will be announced during the class. Grasp them and make some extra credits! You will find out how beneficial they could be to your final grade.

Email: All email to the instructor are suggested to be from an academic email account. Using any other public email account may cause email loss or rejection. Please always include “**EMT 2461**” in the subject line of your email.

Lecture Topics: Listed on the course website

Note: This syllabus is subject to change.