

## MSE 352 - Digital Logic and Microcontrollers (4 credits) Fall 2022

**Lectures:** Mondays, 12:30 – 2:20pm (SRYC5240)  
Wednesdays, 12:30 – 1:20pm (SRYC5240)

**Tutorials:** Wednesdays, 1:30 – 2:20pm (SRYC5240)

Tutorial sessions will be mostly used for catching up on lecture materials.

Also, it will be used for the review of selected problems, guidance on course projects, general course material review and assistance.

**Instructor:** Mohammad Narimani, *Ph.D., P.Eng*  
Lecturer, School of Mechatronic Systems Engineering  
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Office: SRYC4322  
Office hours: by appointment

### Course objectives:

- Introduction to digital systems and number representation, combinational systems and sequential logic circuits, counter design and registers, synchronous sequential design
- Microprocessor applications, memory, and I/O systems; micro-controllers: features, architecture and programming model; Introduction to assembly language and micro-controller programming; timer/counter programming. ADC, DAC, and sensor interfacing.

### Textbook (required):

Digital Logic:  
Digital Design,  
6<sup>th</sup> Edition, by M. Morris Mano and  
Michael D. Ciletti  
Pearson, ©2018  
ISBN 9780134549897

Microcontrollers:  
The 8051 Microcontroller and Embedded  
Systems: Using Assembly and C,  
2<sup>nd</sup> Edition, by MA Mazidi  
Pearson Education  
ISBN 8131710262

More reference:  
Schaum's Outline of Digital Principles, 3rd Edition  
Roger L Tokheim  
McGraw-Hill, 2016  
ISBN 0070650500

### Evaluation Scheme:

4 Quizzes	10%
Course Project	20%
Midterm Exam	30%
Final Exam	40%

(This grading scheme is tentative. The instructor reserves the right to change the scheme)

### Course Outline:

(time schedules to be adjusted as needed throughout the term)

Number Systems	
Logic Gates & Combinational Logic	
Boolean Algebra	
Karnaugh Map	
Sequential Logic & Systems with Memory	
Computer Architecture, Architecture of 8051	
Peripherals: GPIO	
Peripherals: Counter & timers.	
ADC	
Data transmission; Serial data communication	
Interrupts	
Programming with Assembly & C	
Operations in assembly	
Operations in C	

### Exams:

Midterm: Wednesday, October 27<sup>th</sup>, 2021 (in class)

Final: Scheduled by SFU

### Teaching Assistants:

Amirabbas Hadizade, Ph.D. student

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Nima Abdollahpour, M.A.Sc. student

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Navid Fanaee Esfahani, Ph.D. student

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**Additional Information:**

- Teaching materials will be made available on Canvas
- Please check your Canvas and/or SFU email accounts on a regular basis for course announcements, etc.
- It is important to familiarize yourself with the policies and guidelines pertaining to students at SFU, including but not limited to the following:

Code of Academic Integrity and good Conduct:

<http://www.sfu.ca/policies/gazette/student/s10-01.html>

Principles and Procedures for Student Discipline:

<http://www.sfu.ca/policies/gazette/student/s10-02.html>