



UNIVERSITY  
of GUELPH



School  
of  
Engineering

# ENG3640

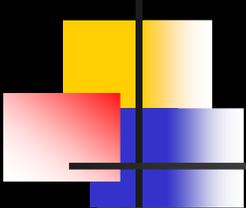
## Micro Computer Interfacing

General Information  
Handout

Fall 2010, September 10<sup>th</sup>

ENG3640 Fall 2010

# Shawki Areibi



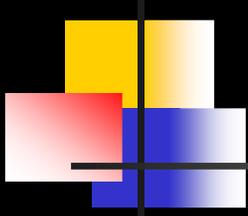
## Office, Email, Phone

- Office: 2335, EXT 53819
- Email: [sareibi@uoguelph.ca](mailto:sareibi@uoguelph.ca)
- Web: <http://www.uoguelph.ca/~sareibi>
- Office Hours: Thur 10:00 – 12:00

PhD, Waterloo 1995

## Research Interests

- VLSI Physical Design Automation (CAD Tools)
- Reconfigurable Computing Systems
- Embedded Systems



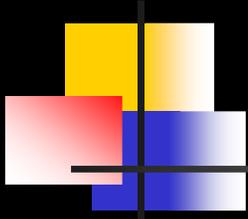
# Outline

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- Info about Staff (TAs, LabTech)
- Lecture and Lab Schedule.
- Course Text and References.
- **Course contents, Schedule.**
- Assignments, Labs, Exams.
- Evaluation
- Academic Misconduct
- Important Information

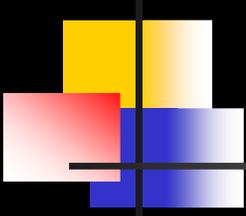
# Lab Coordinator

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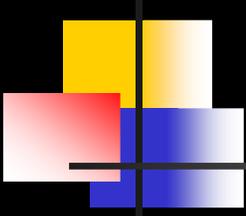
- Nate Groendyk
- Room 2308, ext 53873
- Email: [groendyk@uoguelph.ca](mailto:groendyk@uoguelph.ca)

# Teaching Assistants



- Omar Ahmed, PhD Student
- Room 304, ext -
- Email: [oahmed@uoguelph.ca](mailto:oahmed@uoguelph.ca)





# Lecture & Lab Schedule

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## ➤ Lectures

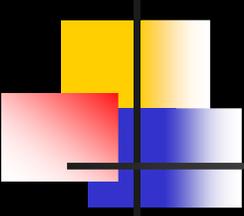
1. 11:30 – 12:20 MACK 308 (M,W,F)

## ➤ Tutorials

1. 12:30 – 1:30 MACK 234 (Wednesday)

## ➤ LABS

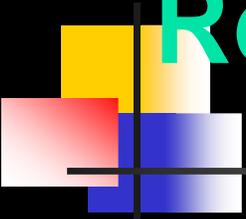
1. 2:30 – 4:20 THRN 2307, (Friday)



# Text Book and References

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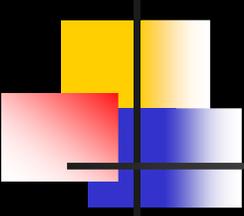
- **Text Book:** MC68HC12: An Introduction Software and Hardware Interfacing, By Huang, 2005.
- **References**
  1. Motorola 68HC11/68HC12 User Manuals
  2. H. Stone, Microcomputer Interfacing
  3. Handouts



# Resources & Communication

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- <http://www.uoguelph.ca/~sareibi>
- Communications
  1. E-mail
  2. Eng364 Web Page (Announcement)
  3. Newsgroup if available

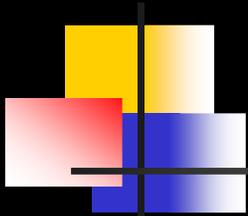


# Course Objectives

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- Introduces you to small microprocessor based systems (Embedded Systems)
- Achieves the following goals:
  1. Learn about Microcontrollers
  2. Understand Software Development
  3. Learn Basic I/O techniques (Parallel, Serial)
  4. Learn Hardware/Software timing and Inter
  5. Understand Data Acquisition Systems

# Acquiring Skills



Essential  
Foundation

Introduction to Interfacing,  
Micro Controller Structure,  
Programming

Interfacing  
Techniques

Parallel Port Interfacing  
Serial Port Interfacing,  
Memory Interfacing

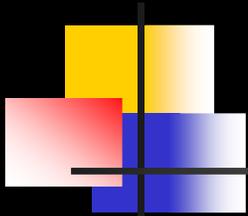
Essential  
Concepts

Interrupts, Timing Generation  
Busses, Transmission Lines

Analog Signals, Sensors,  
Transducers, A/D Conv  
D/A Conv

Data Acquisition  
Systems

# Relationship to Other Courses



ENG241  
Digital Design

Pre-requisite: Should learn  
Combinational and Sequential  
Logic Design, Data Path and  
Control

ENG339  
Signal  
Processing

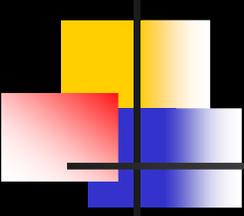
Co-requisite: teaches you the  
Basics of processing signals,  
Filters, DSP Processors, helps  
With Concepts about DAS

ENG354  
Electrical  
Devices

Helps understand issues  
About Transistors, ICs,  
Operational Amplifiers

Will help you with these  
Courses since they use  
Similar concepts covered

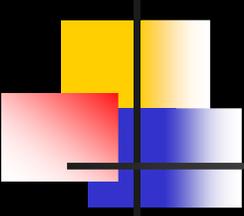
ENG340  
ENG442



# Tentative Schedule

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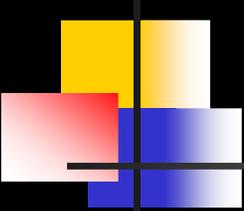
1. Week #1, Introduction to Interfacing, Micro
2. Week #2, #3, Programming, Assembly
3. Week #4, Interfacing Concepts (Parallel)
4. Week #5, Interrupts
5. Week #6, Timing Generation Techniques
6. Week #7, #8, Data Acquisition Systems
7. Week #9, Serial Communication
8. Week #10, Busses
9. Week #11, Memory
10. Week #12, Misc Topics, Review



# Assignments

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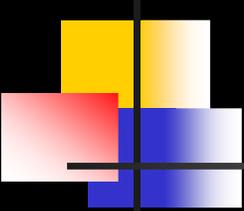
1. **Assignment#1**, (Week#2) → Assembly Language Programming
2. **Assignment#2**, (Week#3) → Cont .. Assembly Programming
3. **Assignment#3**, (Week#4) → General Interfacing Concepts
4. **Assignment#4**, (Week#5) → Interrupt Driven I/O
5. **Assignment#5**, (Week#7) → Data Acquisition System
6. **Assignment#6**, (Week#9) → Serial Communications
7. **Assignment#7**, (Week#10) → Busses and Transmission Lines
8. **Assignment#8**, (Week#11) → Memory Interfacing



# LABS

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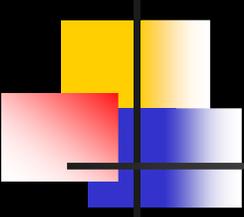
- Labs are an integral part of the course.  
The objectives of the labs are:
  1. Understand and assimilate lecture material
  2. Give practical experience using HC11/HC12
  3. Give you experience using Assembler/Comp
  4. Learn about Serial Communications, Data Acquisition Systems, Interrupts, Timers, LCDs



# Labs: Due Dates

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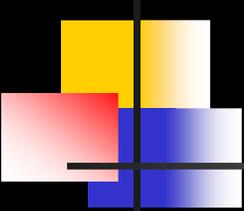
1. **Lab#0**, Week#2, Equipment and Software
2. **Lab#1**, Week#3,→ 4, M68HC12 Programming
3. **Lab#2**, Week#4,→ 5, Parallel Port Programming.
4. **Lab#3**, Week#5,→ 6, Keypad Interfacing
5. **Lab#4**, Week#6,→ 8, Servo Motor Control/LCD
6. **Lab#5**, Week#8,→ 9, Data Acquisition Systems
7. **Lab#6**, Week#9,→ 10, Design of Real Time Clock
8. **Lab#7**, Week#10,→ 11, Serial RF-Communication



# Exam Schedule

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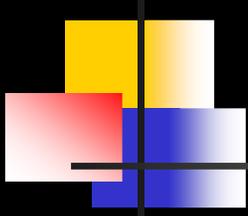
- **Quizzes**, any time! (in Tutorial or Lecture), covers material of previous weeks.
- **Midterms**,
  - Week 8, Thur (TBA)
- **Final Exam**, Week#13, Dec 14th , Covers weeks 1-12



# Evaluation

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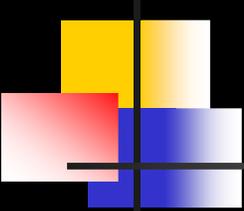
Topic	Weight	Details
Assignments	5%	Every week, Hand in during tutorial
Labs	25%	Report, Questions by TA, Preparation
Quizzes	5%	2 Quizzes, any week.
Midterm	20%	Covers weeks 1-7
Final Exam	45%	Covers topics from Week1-12



# Important Issues

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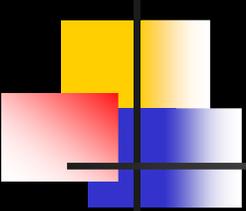
- If you miss a Quiz there will be no make-up for it unless you have a medical excuse.
- In order to pass the course, you must pass both the lab and exam course portion. Students must obtain a grade of **50%** or higher on the exam portion of the course.
- If a laboratory is missed due to illness or other reason, arrangements must be made with the teaching assistant to complete a make-up lab.



# Academic Misconduct

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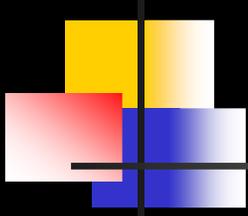
- The policy for this course is zero tolerance for any form of academic misconduct.
- Directly copying another student's work or copying portions of code for example assembly language code e.t.c., is an honor code violation and will result in failing grade and may result in a failing grade in the course.
- Students will automatically be referred to the Director of the School/Dean of CPES for action.
- Please refer to the regulations outlines in the student handbook regarding academic misconduct.



# Simple Advice

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- **Attend all Lectures!**
- **Attempt all assignments**
- **Make use of your Teaching Assistants**
- **Understand the lab requirements and don't rely on your colleagues!!**
- **Study in groups (don't rely on others!)**
- **Identify your strengths and weaknesses**
- **Manage your time!!!!!!!!!!!!**



# Questions?