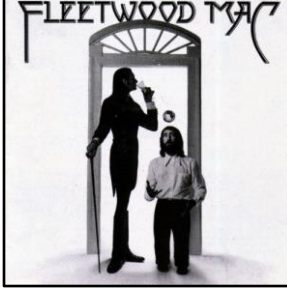


Released  
July 11  
1975



# ECE401

## Perspectives In Electrical and Computer Engineering

### Lecture 1

1

## Today's Topics

- Introductions
  - Who are Armata Kumari and Chris Foster?
  - Who is Professor Messner?
- Classroom Rules
- Material Delivery Methods
- Syllabus Overview
- A personal story and some tips

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 2

2

## What is a TA?

- **T**eaching **A**ssistant
- In charge of the Laboratory experience and possibly some homework grading as well
  - Getting help
    - TAs will have office hours
      - Will be posted outside of Kingsbury Hall room Wxx and on Canvas
    - Please do not wait until the last minute to see a TA when you need assistance!
  - Grading questions
    - Addressed by the TA who graded your work

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 3

3

## TAs for ECE401

Amarta Kumari



Christopher Foster



© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 4

4

## But Who am I?

- Professor Richard A. Messner
  - Born in Chicago 1957
  - Attended Clarkson College of Technology
    - BS – Electrical and Computer Engineering (1979)
    - MS – Electrical and Computer Engineering (1981)
    - PhD – Engineering Science (1984) (Clarkson University)
      - Performed my Ph.D. research at the Naval Research Laboratory in Washington DC on an ONR Fellowship
  - Worked at MITRE Corp in Bedford, MA (1981-1982)
  - Came to UNH in January 1985 (Jan 2021 => 36 years)
    - Specialties: Optical signal processing, digital image processing, biologically inspired signal processing

© Richard A. Messner All Rights Reserved

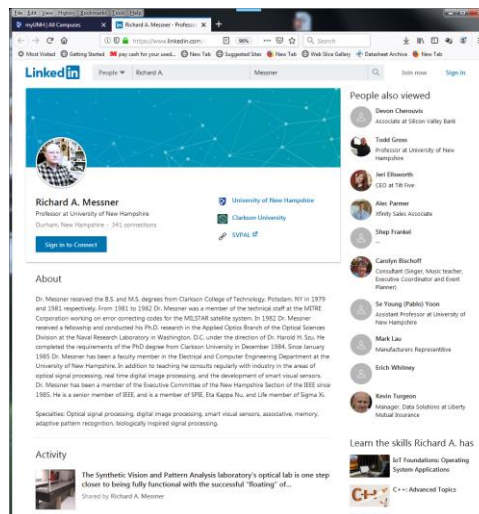
ECE401 - Fall 2020

Slide 5

5

## To find out more about me

- [https://www.linkedin.com/in/richard-a-messner-66440a44?trk=people-guest\\_profile-result-card\\_result-card\\_full-click](https://www.linkedin.com/in/richard-a-messner-66440a44?trk=people-guest_profile-result-card_result-card_full-click)



© Richard A. Messner All Rights Reserved

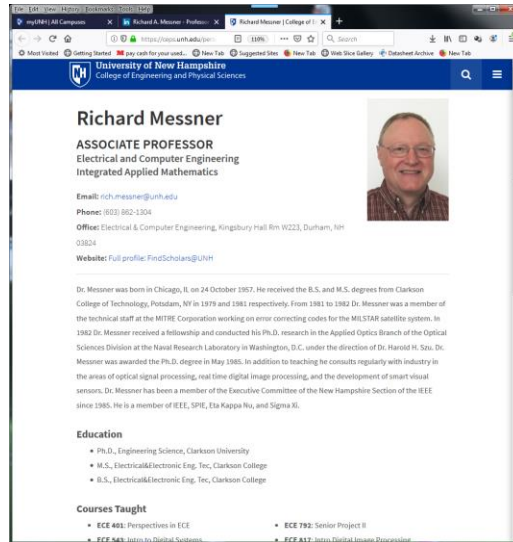
ECE401 - Fall 2020

Slide 6

6

## To find out more about me

- <https://ceps.unh.edu/person/richard-messner>



© Richard A. Messner All Rights Reserved

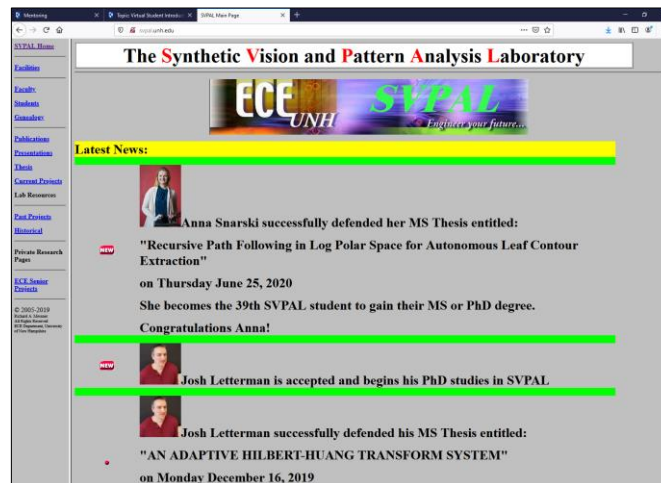
ECE401 - Fall 2020

Slide 7

7

## To Find Out About My Research

- <http://svpal.unh.edu/>



© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 8

8

## How to find me On Campus (by appointment only):

Richard A. Messner, Ph.D.  
Associate Professor, ECE Department  
**Office:** W223 Kingsbury Hall      **Phone:** 862-1304  
**Email:** [rich.messner@unh.edu](mailto:rich.messner@unh.edu)

When you email me place **ONLY**,  
**ECE401**  
In the **SUBJECT** line of the email

## Classroom Rules

## Class Rule 1

- **If you feel ill DO NOT COME TO CLASS**  
(Even if you have a valid Wildcat Pass)
  - Get checked out immediately
    - <https://www.unh.edu/health/>

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 11

11

## Class Rule 2

- **If possible do not come to class late!**
  - Class starts promptly at 11:10AM
  - Entering the classroom late is not only rude it is disruptive to others in the class

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 12

12

## Class Rule 3

- **Once class begins there is to be no chatting among classmates**
  - If you have a question raise your hand and I will acknowledge you. Once acknowledged you can ask your question

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 13

13

## Class Rule 4

- **All unnecessary electronics are to be TURNED OFF AND PUT AWAY during class!**
- Classroom time is for focused attention to the material that is being presented
  - Contrary to popular belief, people do not and cannot **MULTI-TASK**

© Richard A. Messner All Rights Reserved

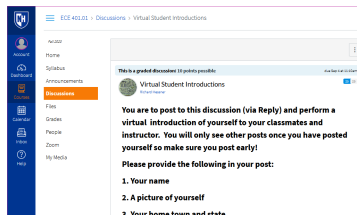
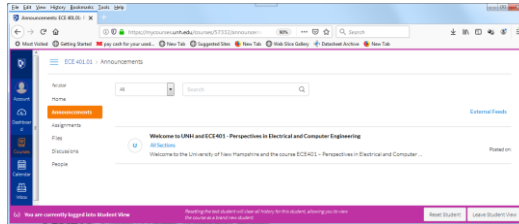
ECE401 - Fall 2020

Slide 14

14

# Material Delivery Method

- Canvas
- Rule 5
  - Check every day!
- Discussion assignment posted
- Assignment 1 is also posted
- Other assignments will soon follow



© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 15

15

# Homework 1

NAME: \_\_\_\_\_

## UNIVERSITY OF NEW HAMPSHIRE DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

ECE401 – Perspectives in Electrical and Computer Engineering FALL 2020

You are to write a one to two-page paper regarding the following question.

**“Why you want to be, or might want to be, an electrical or computer engineer?”**

- All work must be “word-processed” on standard white 8.5” x 11” paper. Ariel font, 12pt double spaced
- You must include this sheet as your cover sheet with your name clearly printed.
- You may use your own computer or the ECE Cluster located in Kingsbury Hall Room N234 for doing this assignment.
- You must upload your electronic document to canvas by the due date for full credit.

Your writing will be graded so please use proper spelling and grammar.

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 16

16



# Discussion Board

Fall 2020

Account

Dashboard

Courses

Calendar

Inbox

Help

Home

Syllabus

Announcements

**Discussions**

Files

Grades

People

Zoom

My Media

**This is a graded discussion: 10 points possible** due Sep 4 at 11:10am

**Virtual Student Introductions** Richard Messner 25

**You are to post to this discussion (via Reply) and perform a virtual introduction of yourself to your classmates and instructor. You will only see other posts once you have posted yourself so make sure you post early!**

**Please provide the following in your post:**

- 1. Your name**
- 2. A picture of yourself**
- 3. Your home town and state**

© Richard A. Messner All Rights Reserved ECE401 - Fall 2020 Slide 17

17

# ECE401 Syllabus

## COURSE DESCRIPTION

An introductory course for electrical and computer engineering majors that introduces incoming students to the fundamental concepts of analysis and design. Concepts are presented through an examination of real-world problems. Students are introduced to electrical and computer engineering problem solving and design through active learning techniques in lecture and in a laboratory setting. This provides a context for the electrical engineering and computer engineering curriculum and introduces the profession and activities of electrical and computer engineering.

**CREDITS:** 4 credits (3 Lecture, 1 Exploratory Section).

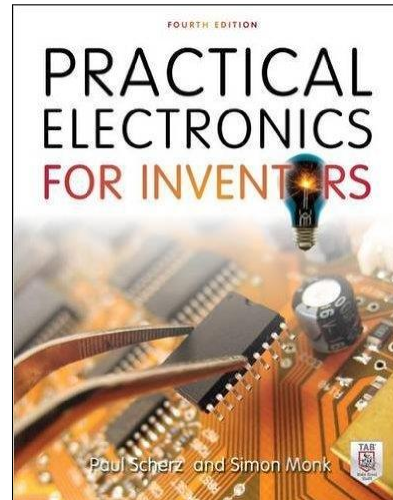
**PRE-REQUISITES AND CO-REQUISITES:** NONE

**COURSES FOR WHICH THIS COURSE IS A PRE OR CO-REQUISITE:** NONE

18

## Textbook

- Paul Scherz and Simon Monk
  - Practical Electronics for Inventors
    - 4<sup>th</sup> Edition
    - Publication Date: 2016
    - McGraw Hill
    - ISBN: 978-1-25-958754-2



© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 19

19

## Teaching Assistants

- Contact Information

**Amarta Kumari**

Room: W214 Kingsbury Hall

Email: [ak1276@wildcats.unh.edu](mailto:ak1276@wildcats.unh.edu)

**Chris Foster**

Room: W214 Kingsbury Hall

Email: [cmf1023@wildcats.unh.edu](mailto:cmf1023@wildcats.unh.edu)

- Tas will be instrumental for help for Laboratory and Homework

**Lab Will Meet This Week!!!!**

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 20

20

# Course goals

1. Introduce the student to the profession and the broad scope of electrical and computer engineering activities.
2. Provide an active learning environment where students are engaged in electrical and computer engineering practices through exploratory activities of "hands-on" laboratory experiences and open ended discussions.
3. Initiates the development of students' basic problem solving, communication, time-management, and other professional skills.
4. Provides students a context for the electrical engineering and computer engineering curriculum.

21

# Lecture Structure

## COURSE STRUCTURE:

The course consists of three lecture/discussion meetings and an exploratory section with a maximum student cap of fifteen per exploratory section. The course is taught by a by an instructor with visiting speakers from industry, the government, ECE department faculty, and graduate assistants. It is important that the student meet a cadre of individuals who practice different aspects of electrical and computer engineering. It is equally important that the student meet many ECE professors to initiate and possibly establish a relationship for undergraduate research.

## COVID 19 SAFETY (LECTURE):

Lectures for this class will be in McConnell room 240 for all face-to-face meeting times. Some classes maybe conducted via zoom. I will inform you prior to those dates where there will be zoom meetings which are planned to be done remotely. For those classes you will not come to class but be expected to be in the zoom meeting for that class period. After November 20<sup>th</sup> all remaining lectures and labs will be all conducted virtually via zoom.

Read the last section of this Syllabus which outlines more specific information on COVID 19 protocol for ECE401

22

# Lab Structure

## EXPLORATORY SECTION:

This four-credit course consists of one credit of exploratory section. Proper preparation for exploratory time cannot be stressed enough, as that preparation will ensure that the student receives the most out of the time spent in this type of setting. Exploratory sections for this course are designed to give the student experiences that will provide the necessary background and disciplinary practices required for subsequent coursework and research. Activities in these exploratory sections will emphasize discussion and frequent student-faculty and student-student interactions including attention to issues of critical thinking and methods of inquiry. Other activities include laboratory experiments that will excite the student to pursue a career in electrical and/or computer engineering or a related fields such bioengineering. A main function of these exploratory sections is to explore the concepts and topics presented in lectures and discussions through further discussions, demonstrations, and at times laboratory investigations.

## COVID 19 SAFETY:

Laboratory for this class will be in Kingsbury Hall room S216 for all lab face-to-face meeting times. After November 20<sup>th</sup> the lab time will be conducted virtually via zoom.

For all “in-lab” meetings you will be sitting at stations that will be the ones assigned to you for the whole semester. **DO NOT CHANGE YOUR SEATING ASSIGNMENT!** This is important to allow for contact tracing should anyone in the lab become infected with the COVID 19 virus.

**Masks and face shields will be REQUIRED to be worn** when in the Laboratory and proper social distancing should be maintained as much as possible.

Read the last section of this Syllabus which outlines more specific information on COVID 19 protocol for ECE401

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 23

23

# Visiting Speakers

## VISITING FACULTY AND EXTERNAL SPEAKERS

An important component of this course is to bring in speakers from both inside and outside the University. These speakers are teaching faculty, regional leaders in industry, or former students who are working in the “real world.” The objective in bringing them to our class is that they can provide us with a high-level perspective of the electrical and computer engineering profession and its future. For the speakers who will be presenting to our class, students may be asked to submit either their notes taken during the presentation or a one-page summary of the topics covered by the presenter. These submissions will be counted as a homework assignment, and they will be graded based upon completeness and writing quality.

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 24

24

# Outcomes

Even though the lectures, discussions, and exploratory sections provide excitement and hopefully evidence for a career in electrical and/or computer engineering, five basic mechanisms are promoted to propel the student into investigation and innovation. The five mechanisms are listed below.

1. Reasoning and critical thinking skills
2. Understanding and practice of research methods
3. Problem solving skills
4. Communications and teamwork skills
5. Ethical Judgement

# Policies and Expectations

## COURSE POLICIES AND EXPECTATIONS

An old adage states: **"Tell me and I forget, show me and I remember, involve me and I understand."** The last part of the statement is the true meaning of inquiry-based education. To accomplish this learning process, students are expected to take responsibility for their own learning and discovery process in this course. Therefore, students shall meet the following expectations and class policies:

**Academic Honesty:** Academic honesty/integrity is expected in all aspects of this course. Academic dishonesty – such as cheating and plagiarism – is grounds for disciplinary action that may range from failing a specific assignment to failing the course to further University sanctions. UNH's policies governing academic honesty can be on-line at: <https://www.unh.edu/student-life/academic-honesty-policy>

**Canvas:** Announcements, course documents (handouts, syllabi, guidelines for assignments, laboratory assignments, etc.), links to additional websites and readings and preparatory material for class will be available via the Canvas portal.

**Class and Attendance:** Attendance is important. As such it is important to attend if you are feeling well. **DO NOT COME TO CLASS IF YOU FEEL ILL OR HAVE A FEVER!** Lectures materials will be posted online for you should you not be able to attend class

# Policies and Expectations

**Class Assignments:** Class assignments will be handed-in at the beginning of the class for which they are due. Late assignments will be penalized by twenty percent per calendar day, regardless of the reason for lateness (barring extenuating circumstances). Missing work will receive a score of "0". Work must be submitted in hard copy form. E-mailed work will only be accepted as a means of proving that an assignment was completed by a due date if other circumstances prevent submission of a hard-copy at that time. A hard copy must follow any e-mail submission. Work will be graded on format in addition to content.

**Class Atmosphere:** Students are expected to behave in an appropriate and respectful fashion towards each other and the class instructor. Students will help create and maintain a learning environment in which all members of the class feel comfortable contributing and participating. Student will also be respectful of the learning environment and avoid distracting and detracting behaviors including, but not limited to: arriving late, leaving early, leaving and reentering class during discussions, having side conversations, eating or drinking noisily, and using cell phones or other personal technological devices.

**Class Participation:** Active participation in the classroom creates a forum for the critical appraisal and free expression of ideas while expanding the range of perspectives on a given issue. Participation also stimulates active thinking and engagement in class topics while encouraging preparation for class. Class participation is a way of improving students' ability to speak publicly, express ideas verbally and consider and engage in the debate of complex topics.

**Class Preparedness:** Students are expected to come to class prepared to fully and actively engage in class activities. Readings, video assignments and any additional assignments are to be completed prior to the start of class.

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 27

27

# Policies and Expectations

**Communication with Instructor:** Students should feel free to approach the course instructor with course-related questions or concerns. The instructor welcomes the opportunity to meet with and assist students. Students needing assistance or special accommodations with any issue should approach the instructor in a timely fashion so that their needs can be addressed and arrangements made as expediently as possible.

**Disability Statement:** If you are a student with a documented disability who will require accommodations in this course, please register with Disability Services for Students for assistance in developing a plan to address your academic needs. Students who are already registered with Disability Services should meet the instructor as early as possible to discuss their needs.

**Group Activities:** Throughout the semester, students may participate in group projects. Students are expected to make appropriate, equal contributions to group activities. Students must make themselves available for group meetings outside of class. Students may be asked to complete a peer evaluation assessing the contributions and efforts of each group member.

**Exploratory Activities:** Students are expected to come to the exploratory section prepared to fully and actively engage in laboratory/exploratory activities. Students should have read, "Laboratory Safety and Standard Procedures" before the first laboratory experience and understand its content.

**Out-of-Class Activities:** Students are expected to complete all out-of-class activities in a timely fashion. Students should expect to spend several hours per week doing class assignments, including, but not limited to readings, writing assignments, research and group work.

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 28

28

# Grading

Grades for ECE401 will be assigned according to the following:

- Participation: 10%
- Homework and quizzes: 30%
- Lab Exercises: 30%
- Poster Presentation 30%

## CHEATING

Instances of cheating, whether it be on quizzes, homework or lab assignments will be taken very seriously. Depending upon the nature of the offense, students caught cheating may receive penalties ranging from loss of credit on a particular assignment to receiving a failing grade in the class.

# Office Hours

## OFFICE HOURS

The instructor(s) are available by appointment. The teaching assistant(s) will be available in their scheduled office hours and also by appointment. To make an appointment, the student should contact the instructor(s) or teaching assistant(s) to work out a mutually agreeable time to meet. For the exploratory portion of the course there will be sufficient coverage by the instructor(s) so that questions can be answered and basic laboratory techniques explored fully.

# Syllabus

## SYLLABUS:

The following is a tentative syllabus. While it will be followed as closely as reason dictates, minor changes may be necessary from time to time; such modifications will be announced in class.

1. What is engineering and how can you survive the curriculum?
  - a. Supplemental materials (see the course Canvas site)
2. College survival techniques and tips
  - a. Supplemental materials (see the course Canvas site)
3. Basic analog engineering 101
  - a. Readings will be assigned on the course Canvas site
  - b. Supplemental materials
4. Basic digital engineering 101
  - a. Readings will be assigned on the course Canvas site
  - b. Supplemental materials
5. A Project Based electrical engineering learning experience
  - a. Readings will be assigned on the course Canvas site
  - b. Supplemental materials

31

# LABORATORY STARTS TODAY!

Kingsbury Hall Room S216

32



## Lab Meeting this Week

All labs are held in Kingsbury Hall in the south wing room S216

- **Monday Section 1 (today)**  
3:10PM – 5:00PM
- **Tuesday Section 2**  
3:40PM – 5:30PM
- **Wednesday Section 3**  
3:10PM – 5:00PM
- **Thursday Section 4**  
3:40PM – 5:30PM
- **Friday Section 5**  
3:10PM – 5:00PM



Face shields and Masks are Required!



© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 33

33

## Laboratory

Lab	Topic	Dates
0	Introduction to Laboratory	Aug. 31 – Sept 4
1	Computer anatomy 101: Identifying common computer components and their arrangement	Prelab: Sept 7 - Sept 11 Lab: Sept 14 - Sept 18
2	Connecting it all together: Proper soldering methods and techniques	Prelab: Sept 21 - Sept 25 Lab: Sept 28 – Oct 2
3	Using test equipment for measurement of AC and DC Voltages, currents, and power Learning about Transformers, Diodes, and Rectification/Filtering	Prelab: Oct 5 – Oct 9 Lab: Oct 12 – Oct 16
4	Construction of a simple linear DC power supply.	Prelab: Oct 19 – Oct 23 Lab: Oct 26 – Nov 6
5	Project based learning experience	Pick: Oct 26 – Oct 30 Research: Nov 2 – Nov 6 Test: Nov 9 – Nov 20

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 34

34

# Questions?

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 35

35

## What am I doing in an Engineering Class?

- The Question that you might ask yourself
  - Why do I want to be an engineer
    - Many different reasons
      - Money?
      - Fame?
      - Parental or family pressure?
      - Don't know what else to do?
      - I am good in math and science?
      - Seemed like the thing to do at the time?
      - Everyone else is doing it?
      - Want to try it out and see if it something I might like?
    - A reason why I eventually wanting to be an engineer
      - I always had a Genuine interest in technology and a desire to invent and build “things”

© Richard A. Messner All Rights Reserved

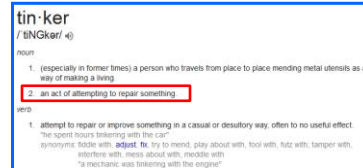
ECE401 - Fall 2020

Slide 36

36

## Exactly the Question I asked

- How I started down my path
  - Always was a tinker
  - Hobby was taking apart all kinds of stuff
- Parents reprimanded me when I took apart the color TV in 1969 and could not make it work properly again
- Grounded for one month! A really long time in 1969
- Also had to pay for the TV repair (very expensive!)



© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 37

37

## Exactly the Question I asked

- Lesson that I learned that time!
  - Learned that what I take apart I should be able to put back together and make it work again!!!!
  - Was hooked from that time forward to find out how that TV worked!

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 38

38

## My Experience

- This is my experience and is not to be taken as the norm of how most persons find that engineering is in their DNA!
  - I starting out Premed at a predominantly engineering school
  - After a few years I found out that I was interested more in engineering
    - Why?
      - Well for me it was because I did not like the grey zones of medicine and the cutthroat nature of the competition that students used in order to guarantee their position for admission to a medical school

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 39

39

## My Experience Continued

- After Switching to Engineering
  - I took the standard curriculum of courses
    - Had I known what I do now I would have possibly taken more advantage of what was available!

**YOU ARE HERE NOW!!!**

**What you do with your future is in your hands**

**RIGHT NOW!**

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 40

40

## But What Do I Do Myself????

- Student situations
  - At this time in your life you will usually fall into one of several categories
    - I know what I want, and I am going after it
    - I sort of know what I want, and I think I know how to get there
    - I like science, math, and computers and think that engineering is what I want to be doing
    - I have no idea of what I want, and engineering seemed to be a meal ticket
    - Everyone tells me that I am smart and thus I should be an engineer
  - Other categories may apply ... please let me know if there are others that I should include

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 41

41

## What did I do?

- I had always been encouraged by my Mom to be a Medical Doctor
  - I thus initially pursued a Premed program
- After a time I realized that I was happier in the more “black and white” world of engineering and ended up switching to the engineering curriculum
  - A major change in my life and I learned quite a lot about myself in the process

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 42

42

## What did I do?

- I learned that I should do what is “right” for me and not what others “feel” is “right” for me.
- I was a shy kid and that hindered my advancement
  - I believe that for me this was caused by an internal feeling of not being “good enough” or “smart enough” to succeed.

**I Eventually Learned that:**  
**CONFIDENCE IN YOURSELF IS IMPORTANT**  
**TO YOUR SUCCESS!!!**

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 43

43

## Now What is Right for **YOU**?

- Your first year is where you begin to learn what is right for you!
  - This course is designed to give you a “heads-up” to electrical and computer engineering.
  - I encourage all of you to use this course to its fullest
    - I know how hard this can be for some students
    - I encourage all of you to seek me and the TAs out to “pick our brains”, and ask the questions that you are curious about and want answered.

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 44

44

## Remember!!!!

- You are all “smart”
  - Or else **YOU** would not be here!
- You have many talented Faculty and teaching assistants here who want you to succeed in your studies!
  - Or else **WE** would not be here either!
- Always ask questions!!!!!!
  - There is no thing as a ‘**DUMB**’ question!!!
    - If you do not know the answer to a question that does **NOT** make you dumb. By asking questions you increase your knowledge and thus your intelligence.

**BY NOT ASKING QUESTIONS YOU ENSURE YOUR OWN  
INGNORANCE !**

© Richard A. Messner All Rights Reserved

ECE401 - Fall 2020

Slide 45

45

End

46