ece | 4805/4806

Two-semester Major Design Experience (MDE)

POSTER EVENT

April 19, 2017
The Inn at Virginia Tech

VirginiaTech

The Major Design Experience, or "capstone" as it is also known, is a culminating experience for undergraduate students during which they have the opportunity to combine all the technical, communication and teamwork skills they have learned into one exciting and meaningful project. Whether a student's career interests lie in working for industry, continuing on for an advanced degree, or pursuing a job in our national labs, the capstone experience is an opportunity to define how they will impact the technical community or society in general.

After much success combining a two-semester format with industry sponsorship, we were pleased to offer it again this year. We recently launched a new section of this exciting class that kicked off in the Spring and will finish in December. This parallel section was created out of feedback from Industry that they would like Juniors to participate. Now second semester Junior students can join this class and even consider an internship during the summer break. I think that you will agree that the result has been a wealth of inspiring and useful projects, which have challenged our students to solve open-ended technical problems defined by our industry partners and guided by our faculty subject matter experts.

I was very pleased to have Professor of Practice Ken Schulz lead the effort this year partnering with Gino Manzo, the course creator, as this course grows in importance to our department. Ken and Gino's combined experience and insight is invaluable to our students in preparing them for the next step in their engineering careers beyond graduation.

Congratulations to all the students for their dedicated efforts, and thanks to our industry sponsors, instructors, and subject matter experts for their tremendous support in this endeavor.

Luke Lester
Professor and Head
Bradley Department of ECE

April 19, 2017

Welcome and thank you for attending our third annual Major Design Experience or "capstone" as it is known, Poster Event!

Today we are celebrating the achievements of 70 students who have diligently worked on 20 diverse industry problems. This combined with our new Spring section of this course makes 2017 the biggest year yet. We have also recently changed the name of this course to "Major Design Experience (MDE)" to acknowledge the growing population of students who will be enrolling in the course as second-semester Juniors.

The goal of this class is to provide students with a "real-life" industry project as part of their major design experience during their senior year. Student teams work with sponsors, who are the customers. With advice from subject matter experts, they complete a meaningful engineering project. This project is managed exactly as if the students were just hired by a company and placed on an engineering team. Students are responsible for generating the project plan and executing it. Throughout the two semesters, they are guided in technical areas by the subject matter experts, and mentored by the instructors in a host of professional and business skills, such as communication, teamwork, ethics, professionalism, company values, metrics, and new business acquisition. By working in teams, they develop leadership and group interpersonal skills, and deal with schedule conflicts and meeting deliverables. Students are responsible for managing the customer relationship and solving the many real-life issues that undoubtedly will occur.

This program is only possible with the dedicated support from our sponsors and subject matter experts, whom we whole-heartedly thank for their unwavering assistance. Thank you for engaging with our program and helping increase the value of our students' education.

I also want to acknowledge and thank Dr. Luke Lester for initiating this class at Virginia Tech and guiding the strategy to better prepare Virginia Tech ECE graduates for the workplace. Thank you, Dr. Lester!

The growth in student enrollment, projects, and parallel sections has allowed us to utilize Gino Manzo in addition to myself as Professors providing students industry perspective as they navigate their projects. Between the two of us, we have more than 70 years of industry experience as practicing engineers and leaders in our respective companies. Thank you, Prof. Manzo!

Finally, we want to thank our students, who were brave enough to try something new. Stepping out of your comfort zone is always a valuable learning experience.

We wish you all the best as you pursue your aspirations.

Sincerely,

Kenneth R. Schulz
Two-Semester Major Design Experience Instructor
Professor of Practice

"This is the most comprehensive course I've ever taken."

"This class has provided some of the most concrete examples of what working in the real world will feel like."

TODAY'S PROGRAM

11:00—11:30 AM	**Sign-in**, review posters
11:30—12:40 PM	**Welcome**—Prof. Kenneth Schulz **Remarks**—Dr. Luke Lester, ECE Department Head **Short team presentations**
12:40—2:30 PM	**Lunch**, review posters
2:30 PM—3:00 PM	**Best Paper Awards**
3:00 PM	**Adjourn**

All guests are requested
to vote for **Best Poster**

Every vote counts

"The class teaches valuable lessons regarding working with a team and a customer, building communication skills, and interacting with different types of people. Lessons that are beneficial and can only be learned with experience. "

"One of the best industry-oriented experiences. It provided insight into the inner workings of leading world-class organizations."

Our Sponsors

With gratitude and appreciation for your dedicated support

Arlington County, Virginia

Micron Technology

Aruba Networks

Moog

BAE Systems

QRC Technologies

General Electric

United Technologies

General Motors with VTTI

Virginia Tech ECE

Ingersoll Rand

Wiley Wilson

Intel Corporation

Zeta Associates

John Hopkins University Applied Physics Laboratory

Innovative Computer Engineering Inc. (ICE)

Lockheed Martin

Project Leadership

This class is only possible because of the commitment, dedication and spirit of the following Customers and Subject Matter Experts. **Thank you!**

SPONSOR	CUSTOMER	PROJECT	SUBJECT MATTER EXPERT
Arlington County, Arlington, VA	Jack Belcher, Sanjay Raman, Peter Ceo, Lauren Bulka	RF/Wireless Sensors for Facility Security, Emergency Management and Response	*Mike Buehrer*
Aruba Networks, Sunnyvale, CA	Ravi Srinivasan, Ajay Pratap Singh	Develop Automation Control Libraries for Controlling Android Devices	*Mark Jones*
BAE Systems, Manassas,VA	James LaRosa, Richard Berger	Create and Execute Relevant Benchmark Software Applications	*Cameron Patterson*
General Electric, Salem, VA	Ryan Miller	Wireless Interface to an Industrial Controller	*Walid Saad*
General Electric Global, Niskayuna, NY	Wesley Skeffington	Prototype Software and Hardware Platform for Power Electronics Controls.	*Rolando Burgos*
General Motors, Detroit, MI with VTTI*	Zac Doerzaph (VTTI), Kurt Rooks (VTTI), Keith Van Houten (GM), Mark Rogers (GM)	Vehicle Cybersecurity Penetration Testing	*William O. Plymale*
Ingersoll Rand, La Crosse, WI	Ben Clark	Bearing-less Electric Motor Design Aspects	*Dan Sable*
Intel Corporation, Hillsboro, OR	Sean King	CMOS Interconnect Compatible Resistive Switching Devices	*Mariusz Orlowski*
Johns Hopkins University Applied Physics Laboratory, Laural, MD	Thomas R. Hanley	Design and prototype testing of a tunable compact RF receiver	*Walid Saad*
Lockheed Martin, Moorestown, NJ	Andrew Botelho	RF Circuits Capable of Operating at High Temperatures	*Dong Ha*

**Virginia Tech Transportation Institute*

SPONSOR	CUSTOMER	PROJECT	SUBJECT MATTER EXPERT
Micron Technology, Manassas, VA	Abbas Hussain, Zuzana Steen	Develop a Novel Light-Trapping Technology	*Wei Zhou*
Micron Technology, Manassas, VA	Abbas Hussain, Zuzana Steen	How Atomic Layer Deposition can be Used for Gas Sensing Applications	*Masoud Agah*
Moog, Blacksburg, VA	Heath Kouns	Contactless Power Transmission	*Rolando Burgos*
QRC Technologies, Fredricksburg, VA	Charles Cushing	Wide Band RF Location Antenna Switching Accessory	*Louis Beex*
United Technologies, Rockford, IL	John Sagona	Additive Manufacturing of Magnetic Components	*G.Q. Lu*
United Technologies, Rockford, IL	Eelco Scholte, Kevin Fritz, Shawn Warner, Michael Hanson	Explore "Light-weight" Hardware/Software Protocols Build on Top of Standard Ethernet	*Mark Jones*
Virginia Tech ECE	Virgilio Centeno	Design Small Hydroelectric Generator for the Duck Pond at Virginia Tech	*Virgilio Centeno*
Virginia Tech ECE	Kathy Atkins	Mobile Inventory Database System	*Paul Plassman*
Wiley Wilson, Lynchburg, VA	Walt Mendenhall, Mark Atkinson, Steve Bowman	Demonstrate a Power System Two Bus Transfer Scheme	*Piyush Gupta*
Zeta Associates, Fairfax,VA **Innovative Computer Engineering Inc. (ICE)**	Ben Beasley, Michael Botkin Rich Holley	Personal Locator Beacons Systems Architecture	*Louis Beex*

Guest speakers in order of appearance

In addition to our project sponsors and subject matter experts, there were many others that significantly contributed to the success of this class. We want to take this opportunity to express our deep-felt appreciation and thanks for their contributions.

Mr. Cesare Caprio
BAE Systems (retired)
Program Management, Resume Reviews, Mentoring

Dr. William Baumann
Virginia Tech – ECE
Design Studio Safety Training and Material Procurement Instruction

Mr. Michael Miller
Virginia Tech – Intellectual Properties
Innovation and Intellectual Property Management

Ms. Michele Mayberry
New River Valley IP Law
Intellectual Property Issues for Recent Grads

Mr. Toby Meadows
NAVAIR Leadership

Special thanks also to **Mr. Ben Conlon** and **Mr. Mohammad Al-Mamun**
Teaching Assistants for the Intel and Micron Projects.
Provided excellent safety, tool, semiconductor processing, and mask design training.

PROJECT TEAMS

RF/Wireless Sensors for Facility Security, Emergency Management and Response

Project Sponsor:
Arlington County
Jack Belcher, Sanjay Raman, Peter Ceo, Lauren Bulka

SME:
R. Michael Buehrer

CHALLENGE:

The Water and Wastewater Systems Sector in Arlington County is interested in installing a 24/7 Radio Frequency Identification [RFID] System to locate personnel and visitors. The system is to be used during emergencies, such as the release of toxic gaseous chemicals. This project focuses on the design of a wireless sensor network that can provide sensor information for situational awareness within and around a facility, and can provide position location information on personnel within the facility.

Ali Alkhzaimi, Nisheeth Chauhan, Handa Li, Lindsey Ocheltree

Ali Alkhzaimi

B.S. in Electrical Engineering

ASPIRATIONS:
To utilize my engineering skills and experience to get higher achievements.

CLASS COMMENT:
I gained some experience about real life projects and how to interact with customers and team members.

Handa Li

Bachelor in EE

ASPIRATIONS:
To become a qualified electrical engineer.

CLASS COMMENT:
I learned a lot of useful things in a non-technical field from this class.

Nisheeth Chauhan

Master's in EE

ASPIRATIONS:
To develop next generation wireless networks.

CLASS COMMENT:
A complete class with a lot of learning and guidance about professional life after college.

Lindsey Ocheltree

Bachelor in EE

ASPIRATIONS:
To become an influential engineer and leader.

CLASS COMMENT:
Senior design has allowed me to experience real world scenarios and get a feel for what type of job I would like to pursue.

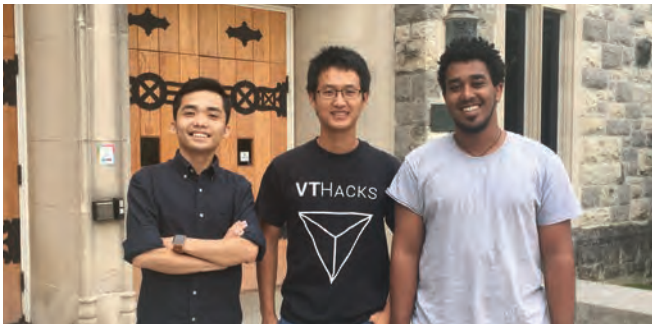
Develop Automation Control Libraries for Controlling Android Devices

Project Sponsor:
Aruba Networks Inc.
Ravi Srinivasan and Ajay Singh

SME:
Mark Jones

CHALLENGE:

Every Aruba's product needs to go through multiple regress cycles of testing. If the IDE integrates the automation framework, it is sure to reduce the heavy workload.



Nhan Pham, Dong Wang, Leoul Yiheyis

Nhan Pham

Computer Engineering

ASPIRATIONS:
Nhan's aspiration as an engineer is to directly contribute to the technology field and make our world a better place.

CLASS COMMENT:
Senior Design helped Nhan take what he has learned to solve real world problems and taught him professional skills for the workplace.

Leoul Yiheyis

Computer Engineering

ASPIRATIONS:
Leoul is an aspiring Software Engineer with an upcoming internship at Capital One and full-time position at NetApp.

CLASS COMMENT:
Senior Design has really helped Leoul take all he has learned in the classroom setting and apply it in the corporate world.

Dong Wang

Computer Engineering

ASPIRATIONS:
Dong is an aspiring Software Engineer. He excels at object-oriented programming. He has outstanding communication and teamwork skills.

CLASS COMMENT:
Dong learned a lot from Senior Design. It helped Dong learn how to work more professionally.

Create and Execute Relevant Benchmark Software Applications

Project Sponsor:
BAE Systems
James LaRosa, Richard Berger

SME:
Cameron Patterson

CHALLENGE:

Create benchmarks to test the performance of the MPC5554 EVB and upgrade the external memory chip up to 8 MB.

Yuming Sun, Grace Lainez, Josh Hernandez, Ryan Owens

Josh Hernandez

Computer Engineering

ASPIRATIONS:
My aspirations include graduating college and working as a C++ developer. I would like to work in Virginia to stay close to my family and friends.

CLASS COMMENT:
This course was a unique experience that provided my team development in public speaking, professional communication, and teamwork. Our customer, mentor, and subject matter expert provided real-world insight for our project and helped guide us to be effective engineers.

Ryan Owens

Electrical Engineering

ASPIRATIONS:
Professional Control Systems Integration

CLASS COMMENT:
Project execution experience.

Grace Lainez

Computer Engineering

ASPIRATIONS:
I hope to go into consulting or something similar. Additionally, I plan to stay in the NoVA area to stay close to my family and help take care of my mother and father.

CLASS COMMENT:
I believe the design of this course was well made. My team and I definitely learned much more than we could have in a classroom.

Yuming Sun

Electrical and Computer Engineering

ASPIRATIONS:
I really enjoy developing large machines, I would like to be a hardware developer after graduation and hopefully work on some big projects.

CLASS COMMENT:
This class helped us to gain more hands-on experience on how this industry works and a lot of communication skills.

Wireless Interface to an Industrial Controller

Project Sponsor:
GE Energy Connections
Ryan Miller

SME:
Walid Saad

CHALLENGE:

Build a wirelss control interface for a solar panel to maximize power output and efficiency, and utilize the Predix cloud.

Andrew Bryant, Josh Knestaut, Frank Liang

Andrew Bryant

Computer Engineering

ASPIRATIONS:
Work as a software developer or system engineer out of college, eventually work in engineering management.

CLASS COMMENT:
This class is a great opportunity to get experience in a professional enviroment, which can be very different than school.

Joshua Knestaut

Electrical Engineering and Computer Engineering

ASPIRATIONS:
Escape Earth's atmosphere—contribute to the exploration of space as a software engineer.

CLASS COMMENT:
This course is a great opportunity to mix a technical challenge with professionalism.

Yuqiao Liang

Computer Engineering

ASPIRATIONS:
Work for a big company or start my own business.

CLASS COMMENT:
This is the most comprehensive course I've ever taken. It provides an opportunity to work and study in business.

Prototype Software and Hardware Platform for Power Electronics Controls

Project Sponsor:
GE Global Research
Wesley M. Skeffington

SME:
Rolando Burgos

CHALLENGE:

Design and develop a control platform that will be used to control power electronic systems.

Daniel Bizup, Abhinav Agrawal, Connie Lim, Moneeb Waseem

Abhinav Agrawal

Electrical Engineering B.S.

ASPIRATIONS:
Land a job at a successful company in the networking field.

CLASS COMMENT:
This class helped me gain valuable technical and management skills that will help me in the corporate world.

Connie Lim

Computer Engineering B.S.

ASPIRATIONS:
I want to become an embedded engineer.

CLASS COMMENT:
The class allowed me to further hone my teamwork skills.

Daniel Bizup

Computer Engineering B.S.

ASPIRATIONS:
To be a successful computer engineer.

CLASS COMMENT:
The class provided a lot of experience with scheduling and planning milestones.

Moneeb Waseem

Computer Engineering

ASPIRATIONS:
To excel in the field of cybersecurity and software engineering.

CLASS COMMENT:
This class provided me with experience on how to work on a contract in the work environment.

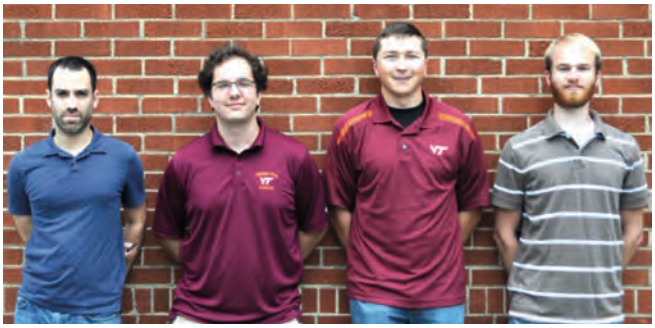
Vehicle Cybersecurity Penetration Testing

Project Sponsor:
General Motors / VTTI
Zac Doerzaph (VTTI),
Kurt Rooks (VTTI),
Mark Rogers (GM)

SME:
William O. Plymale

CHALLENGE:

Design a filter to prevent malicious third party devices from interfering with critical vehicle functions.



Reuben Strangelove, Thomas Bonanno, Chris Cox, Tim Geoghegan

Thomas Bonanno

Computer Engineering

ASPIRATIONS:
Work with a team on cutting-edge technology to further the progress of human colonization of Mars.

CLASS COMMENT:
I thoroughly enjoy working with a company on real-world problems and solutions.

Timothy Geoghegan

Electrical Engineering

ASPIRATIONS:
To apply the skills and knowledge I have acquired in school to solving real world problems.

CLASS COMMENT:
A departure from the typical class based solely on technical work.

Chris Cox

Computer Engineering

ASPIRATIONS:
Work in a full-time position as a team member in a programming and/or hardware environment to help improve a company.

CLASS COMMENT:
Real-world projects with real-world customers.

Reuben Strangelove

Computer Engineering

ASPIRATIONS:
To protect the security of our citizens from threats both foreign and domestic.

CLASS COMMENT:
A valuable experience.

Bearing-less Electric Motor Design Aspects

Project Sponsor:
Ingersoll Rand
Ben Clark

SME:
Dan Sable

CHALLENGE:

Design and build a bearingless magnetic motor, with use of passive and active control systems.

Drew Simonsen, Christine Whiteside, Dow Perkins

Dow Perkins

B.S. in Computer Engineering

ASPIRATIONS:
Find a way into space or into a job at NASA.

CLASS COMMENT:
This class has provided some of the most concrete examples of what working in the real world will feel like.

Drew Simonsen

B.S. in Electrical Engineering

ASPIRATIONS:
Enter the private industry designing equipment for a military supplier. Eventually get a master's degree in business.

CLASS COMMENT:
I believe this class far greater represents what it will be like in the real world than any other capstone course.

Christine Whiteside

B.S. in Electrical Engineering

ASPIRATIONS:
Enter private industry, potentially get a master's in CS and explore a variety of roles such as a designer or product engineer.

CLASS COMMENT:
I really enjoy how the class allows us to work with a customer outside of Virginia Tech and gives us good opportunities to grow as a professional.

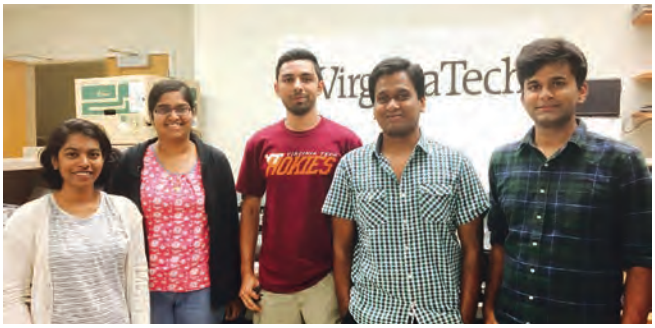
CMOS Interconnect Compatible Resistive Switching Devices

Project Sponsor:
Intel
Sean King

SME:
Marius Orlowski

CHALLENGE:

To investigate the potential inert counter electrode like Rh, Ir, and high-k dielectric for implementing Resistive Switching memory in CMOS Back End of line (BEOL).



Srilekhya Reddy Meda, Sai Rama Usha Ayyagari, Rizwan Ali, Sagar Praveen Yammiyavar, Avanish Mishra

Rizwan Ali

M.S., Electrical Engineering

ASPIRATIONS:
M.S., Electrical Engineering.

CLASS COMMENT:
To research and harness novel materials and morphologies and incorporate them in the current FEOL and BEOL.

Sai Rama Usha Ayyagari

M.Eng, Electrical Engineering

ASPIRATIONS:
To engineer products that could simplify the human life and contribute to the development of society.

CLASS COMMENT:
This class helped develop both technical and non-technical skills needed for having a successful career in industry.

Srilekhya Reddy Meda

M.Eng, Electrical Engineering

ASPIRATIONS:
To engineer solutions to complex semiconductor challenges and add value to the world around me.

CLASS COMMENT:
Professional skills learned in this class are the biggest takeaways from my two years at Virginia Tech.

Sagar Praveen Yammiyavar

M.Eng, Computer Engineering

ASPIRATIONS:
To be a respected technology writer/reviewer.

CLASS COMMENT:
One of the best industry-oriented experiences. It provided insight into the inner workings of leading world-class organizations."

Avanish Mishra

B.S., Computer Engineering

ASPIRATIONS:
Want to be a algorithm developer. I like the mathematical side of CS and would love to work on it.

CLASS COMMENT:
Working on a project in a team is extremely beneficial.

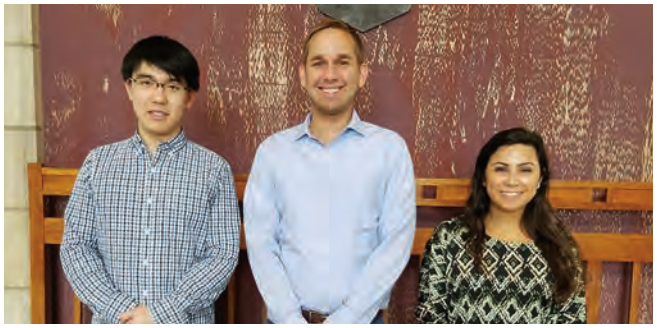
Design and Prototype Testing of a Tunable Compact RF Receiver

Project Sponsor:
John Hopkins APL
Thomas R. Hanley

SME:
Walid Saad

CHALLENGE:

Design and prototype testing of a tunable compact RF receiver or SDR and processor that can ultimately be flown on a small, low cost, UAV.



Xiaoyu Han, Douglas Zanbransky, Madeline Guillen

Xiaoyu Han

Electrical Engineering

ASPIRATIONS:
To keep working on his research on radio propagation and satellite signal scintillation during a solar eclipse, and hopefully find out a thesis topic for graduate school.

CLASS COMMENT:
Great to be able to apply and work with another project I am passionate about.

Douglas Zanbransky

Electrical Engineering

ASPIRATIONS:
To finish master's degree in computer engineering at Virginia Tech and then work in the field of cybersecurity.

CLASS COMMENT:
Great to be able to establish new networks within John Hopkins APL.

Madeline Guillen

Electrical Engineering

ASPIRATIONS:
To get an MBA, become an engineering project manager, and continue serving communities.

CLASS COMMENT:
Very useful to gain real project management skills.

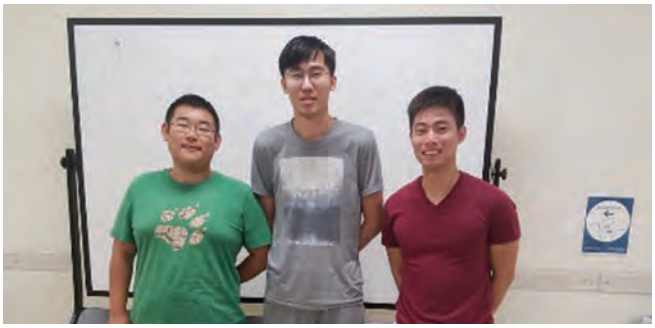
RF Circuits Capable of Operating at High Temperatures

Project Sponsor:
Lockheed Martin
Andrew Botelho

SME:
Jebreel Salem

CHALLENGE:

The challenge is to adjust the bias voltages of building RF blocks to maintain optimal operating points for a wide temperature range. The project is to design a bias voltage circuit, which senses the ambient temperature to adjust the bias voltage of a given RF building block.



Shijun Lu, Yuxiang Tian, Yohan Cho

Yohan Cho

Bachelor in Electrical Engineering

ASPIRATIONS:
Not ordinarily as an electrical engineer, I will work as a software engineer after graduation. One day, I wish to be like Mark Zuckerberg.

CLASS COMMENT:
It was great to utilize my skills obtained from college courses and to learn project management. It was special to know what it feels like to work at a company.

Shijun Lu

Bachelor in Electrical Engineering

ASPIRATIONS:
I plan to go to graduate school after graduation. I will continuously study RFIC technology, and I want to become a professional engineer in the future.

CLASS COMMENT:
This class is super cool. We have a goal, and team members work together to complete this project. From the class, we learned that it's important to make a detailed plan ahead of time and prepare alternative methods, and we learned to cooperate as a team and manage time properly.

Yuxiang Tian

Bachelor in Electrical Engineering

ASPIRATIONS:
I want to be a great electrical engineer and Can do more different projects by myself.

CLASS COMMENT:
Our team discussed the project each week and tried different ways to solve each project. I learned how to work on a project.

Develop a Novel Light-Trapping Technology

Project Sponsor:
Micron Technology
Zuzana Steen,
Abbas Hussain

SME:
Wei Zhou

CHALLENGE:

Develop thin film metal dielectric plasmonic film with spectral reflectance less than 10% over 500nm–900nm wavelength.

Syed Rumman, Samiha Salam, Ash Deval, Meiyun Zhou

Ash Deval

Computer Engineering

ASPIRATIONS:
I wish to work in industry once I'm done with college. I also wish to pursue an MBA at some point in the future.

CLASS COMMENT:
I think this class has taught me so much about professionalism. I'm able to write better emails and better communicate.

Samiha Salam

Electrical Engineering

ASPIRATIONS:
I hope to continue working and researching in the semiconductor field. I would also like to pursue my dream to be a photographer side by side.

CLASS COMMENT:
This class was very effective in teaching us the official side of working in a project/job. For example, writing proposals, customer reports, weekly reports, and etc.

Syed Rumman

Electrical Engineering & Physics

ASPIRATIONS:
I am inspired to do this project in order to make renewable energy more efficient.

CLASS COMMENT:
This class was like being thrown in the ocean while not knowing how to swim. As I write this, I am learning how to swim.

Meiyun Zhou

Electrical Engineering

ASPIRATIONS:
World peace! I hope this project could help people to develop the solar cell efficiency to encourage the use of environmental friendly energy.

CLASS COMMENT:
This class was a guide to help us understand how to work with teammates and customers.

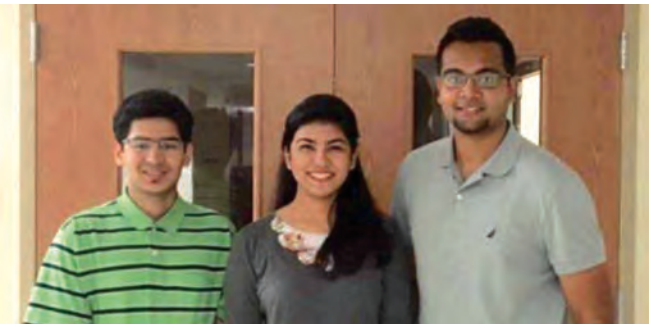
How Atomic Layer Deposition can be Used for Gas Sensing Applications

Project Sponsor:
Micron Technology
Zuzana Steen,
Abbas Hussain

SME:
Masoud Agah

CHALLENGE:

The main purpose of this project is to use atomic layer deposition to create a sensor to study its response to various samples dissolved in distilled water.



Devansh Malhotra, Saiara Adrita, Irfanul Kabir

Saiara Adrita

Electrical Engineering

ASPIRATIONS:
I aspire to combine my technical skills with my management skills to excel in the field of engineering.

CLASS COMMENT:
This class was a great tool to prepare us for real-world projects. Working on this project gave me the opportunity to learn and apply knowledge of material science and semiconductors.

Devansh Malhotra

Electrical Engineering

ASPIRATIONS:
I aspire to apply my EE knowledge in a high quality engineering environment and add value to an organization's operations.

CLASS COMMENT:
The class has helped me develop a lot of professional and interpersonal skills. The project has helped me enhance my semiconductor knowledge.

Irfanul Kabir

Electrical Engineering

ASPIRATIONS:
Obtain technical experience in hardware development and merge into project management.

CLASS COMMENT:
This class helped me learn a great amount of technical knowledge in terms of material science, professionalism and technical reports.

Contactless Power Transmission

Project Sponsor:
Moog
Heath Kouns

SME:
Rolando Burgos

CHALLENGE:

The goal of our project is to build a module that can transfer high amounts of power without physical contact. Providing this option to Moog will allow for flexibility in various power transmission applications.

Hao (Steven) Xue, Andrew Lazzaro, Tahagod Mohamed

Andrew Lazzaro

Electrical Engineering

ASPIRATIONS:
As I start my career this summer with Gulfstream Aerospace Corporation, I hope to move up within the company and over time work my way into a management role.

CLASS COMMENT:
I greatly enjoyed the book The Five Dysfunctions of a Team. It opened my eyes to ways that a team may not be functioning under the surface.

Hao (Steven) Xue

Electrical Engineering

ASPIRATIONS:
As I work with CPES at Virginia Tech, I enjoy applying power electronics knowledge to various applications.

CLASS COMMENT:
I enjoy the hands on opportunity to work on a full design process.

Tahagod Mohamed

Electrical Engineering

ASPIRATIONS:
Inspire and uplift young underrepresented students to pursue higher education.

CLASS COMMENT:
I appreciate the exposure to customer relations and the importance of managing and working through a challenging project.

Wide Band RF Location Antenna Switching Accessory

Project Sponsor:
QRC Technologies
Charles Cushing

SME:
Louis Beex

CHALLENGE:

In this two-semester senior design project, Team QRC is making a Wide Band Transcoder (WBT) controlled "Geo-tenna' Switching Tool Kit. The challenges we faced were coding for the switch, voltage conversion and PCB design.

Sheng Wei, Nazmul Chowdhury, Setor Zilevu

Nazmul Chowdhury

Electrical Engineering

ASPIRATIONS:
To get admitted into one of the top 5 American graduate schools.

CLASS COMMENT:
This class has helped me to learn and gain more technical confidence, and taught me industry skills.

Sheng Wei

Computer Engineering

ASPIRATIONS:
To be familiar with engineering ethic code, leadership, teamwork.

CLASS COMMENT:
The class helped me to learn real industry engineering skills.

Setor Zilevu

Computer Engineering

ASPIRATIONS:
To create a social media startup.

CLASS COMMENT:
This class has helped me learn the interpersonal skills neccesary to succeed in engineering.

Additive Manufacturing of Magnetic Components

Project Sponsor:
United Technologies
John Sagona

SME:
G.Q. Lu

CHALLENGE:

The project focuses on the research and 3-D printing of transformer bobbins using different materials. After analyzing their mechanical properties, a suggestion will be formed regarding the most suited material for printing a bobbin with today's technology.

Shubhendu Gami, Pia Balangue, Zachary Newhart

Pia Balangue

B.S. Electrical Engineering

ASPIRATIONS:
I plan to enter the work field and pursue a master's degree in systems engineering. In my spare time, I hope to travel the world.

CLASS COMMENT:
The class teaches valuable lessons regarding working with a team and a customer, building communication skills, and interacting with different types of people. Lessons that are beneficial and can only be learned with experience.

Shubhendu Gami

B.S. Electrical Engineering

ASPIRATIONS:
I plan on entering the workforce upon graduation and pursuing a business concentration for my master's.

CLASS COMMENT:
The class has been the highlight of my academic years at Virginia Tech. The capstone has provided an opportunity to gain real-world experience working alongside a leading technology company.

Zachary Newhart

B.S. Electrical Engineering

ASPIRATIONS:
I plan to enter the workforce in circuit building and enter a contract with the military to work with the government.

CLASS COMMENT:
This class has been a great experience with the feeling of real-world experience. This class initially felt like heavy paperwork, but after a point it became more interactive and working experience-related.

Explore "Light-weight" Hardware/Software Protocols Build on Top of Standard Ethernet

Project Sponsor:
United Technologies
Eelco Scholte, Kevin Fritz, Shawn Warner, Michael Hanson

SME:
Mark Jones

CHALLENGE:

Proposing a deterministic lightweight protocol compatible with 802.3 mac hardware giving desired system performance for safety critical applications.

Sameeksha Tomar, Aakanksha Sharma, Nathan Mortellaro

Nathan Mortellaro

B.S. Electrical Engineering

ASPIRATIONS:
Controls engineer, entrepreneur, investor, philanthropist, and car collector.

CLASS COMMENT:
This class has really helped me improve my communication skills in a team-oriented environment.

Aakanksha Sharma

Master's in Electrical Engineering

ASPIRATIONS:
Network engineering.

CLASS COMMENT:
This class has taught me a multitude of soft skills that are so important and helpful.

Sameeksha Tomar

Master's in Electrical Engineering

ASPIRATIONS:
System's engineer, public service.

CLASS COMMENT:
This class has given me an insight into how companies work; technical managerial and monetary aspects of projects undertaken.

Design Small Hydroelectric Generator for the Duck Pond at Virginia Tech

Project Sponsor:
Virginia Tech ECE

SME:
Dr. Virgilio Centeno

CHALLENGE:

To install a grid tied hydroelectric generator on the duck pond.

Will McGowan, Don Anderson, Alain Mbateng

Donald Anderson

Electrical Engineering

ASPIRATIONS:
To get my PE license and contribute towards a reliable, efficient, and sustainable energy future.

CLASS COMMENT:
I like that it is a hands-on experience, not just theoretical learning.

Will McGowan

Electrical Engineering

ASPIRATIONS:
To use my degree to help make energy generation more environmentally friendly.

CLASS COMMENT:
This class has taught me about project management and planning.

Alain Mbateng

Electrical Engineering

ASPIRATIONS:
To become a professional engineer and contribute to the electrical engineering field.

CLASS COMMENT:
The fact that it is divided into two semesters makes it easier to understand the different aspects of the project.

Mobile Inventory Database System

Project Sponsor:
Virginia Tech ECE

SME:
Paul Plassmann

CHALLENGE:

To develop mobile applications for the ECE department to track, check details and transfer inventory items digitally.

Praneeth Gurram, Ritu Malik, Abhijeet Tawar, Weijia Xu

Praneeth Gurram

M.Eng

ASPIRATIONS:
To be a successful software engineer.

CLASS COMMENT:
Learned how to present ourselves in corporate meetings and lectures.

Ritu Malik

M. Eng.

ASPIRATIONS:
To learn and polish my skills enough to make a difference in the industry.

CLASS COMMENT:
This class gave us exposure to how a team functions in the corporate world.

Abhijeet Tawar

M. Eng

ASPIRATIONS:
To enhance my skills in software development to achieve big goals.

CLASS COMMENT:
This class improved our skills as professional software engineers.

Weijia Xu

M.Eng.

ASPIRATIONS:
To be a professional full stack developer.

CLASS COMMENT:
This class provides practical experience, software development, and teamwork.

Demonstrate a Power System Two Bus Transfer Scheme

Project Sponsor:
Wiley Wilson
Walt Mendenhall,
Mark Atkinson,
Steve Bowman

SME:
Piyush Gupta

CHALLENGE:

Transfer power from one source to another during a fault.

Piyush Gupta, Jose Sanchez, Dawit Challa

Jose Alberto Sanchez

B.S. in Electrical Engineering

ASPIRATIONS:
To create and lead my own company in Panama, which is where I'm from.

CLASS COMMENT:
This is the only class I have taken where real-world problems are the focus of the class.

Piyush Gupta

Master of Science in Electrical Engineering

ASPIRATIONS:
To continue to serve in the area of power systems.

CLASS COMMENT:
Industry-like experience with a focus on technical and project management skills.

Dawit Challa

B.S. in Electrical Engineering

ASPIRATIONS:
To be able to design circuits for different functionality.

CLASS COMMENT:
This class prepares students for the real world by involving students with company projects.

Personal Locator Beacons Systems Architecture

Project Sponsors:

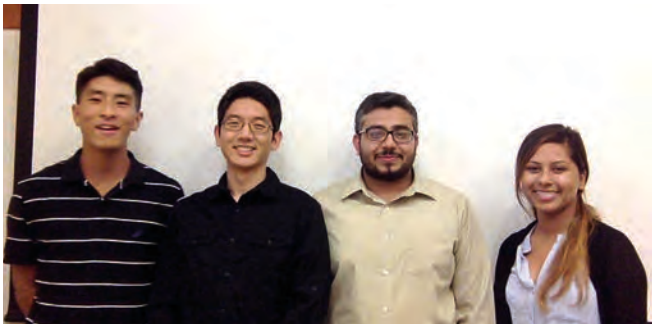
Zeta Associates
Ben Beasley and Michael Botkin

Innovative Computer Engineering Inc.
Rich Holley

SME:
Louis Beex

CHALLENGE:

Design, test, and prototype a complete system architecture to support multiple beacons, each transmitting a unique ID and GPS position.



Justin Kobayashi, Andrew Lee, Suhaib Tahir, Sabrina Faruque

Sabrina Faruque

Electrical Engineering

ASPIRATIONS:
To obtain an entry-level position as an Electrical Engineer alowing me to utilize my educational experience while gaining valuable work experience.

CLASS COMMENT:
I appreciate the professional experience that is provided from the class.

Suhaib Tahir

Electrical Engineering

ASPIRATIONS:
I want to pursue a job in the field of software defined radios.

CLASS COMMENT:
I enjoy the hands-on experience from this project.

Justin Kobayashi

Electrical Engineering

ASPIRATIONS:
I want to be an amazing engineer, musician, and worship leader in the future

CLASS COMMENT:
I like how the class resembles the “real world.”

Andrew Lee

Electrical Engineering

ASPIRATIONS:
I am pursuing work with digital communications after obtaining my degree.

CLASS COMMENT:
I enjoy the hands-on experience that this class offers.

Many people contributed to this program that we want to acknowledge and thank:

Dr. Luke Lester
for his vision and continued unyielding support to make this class available for students.

Mr. Gino Manzo
for designing this class, being our assistant instructor, mentoring teams, and making the class better.

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Mr. Bob Lineberry
Mr. Kenny Jarles
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Ms. Deborah Hamilton
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