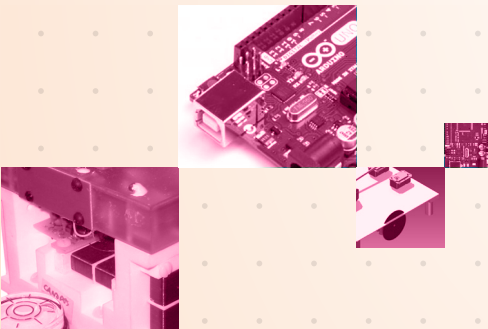


ece 4805/4806

Two-semester Senior Design Capstone **POSTER PAPER EVENT**

April 29, 2015
The Inn at Virginia Tech





ONE OF MY GOALS when I came to Virginia Tech was to initiate a two-semester Senior Design experience that would teach upper classmen team building and project leadership skills while immersing them in a technical project.

It is my belief that the two-semester format not only lets students take on more challenging projects, but also permits them to pursue their passion and have FUN! In the midst of all the required courses, time-consuming homework, and rigorous exams, it is important that we allow engineering students ample

opportunity to pursue their creative side and stay inspired.

I was extremely pleased to have the opportunity to hire Gino Manzo as a Professor of Practice with the express purpose of having him run the new two-semester course. Gino recently retired from BAE Systems and has over 38 years of experience in the engineering field. He has been an inspiration and a guiding light to our students. Welcome Gino and congratulations to all the students on a job well done in this inaugural year of the two-semester format!

Luke Lester

*Professor and Head
Bradley Department of ECE*



April 29, 2015

WELCOME AND THANK YOU for attending our inaugural Two-Semester Senior Design Capstone Poster Paper Event.

The goal of this class is to provide students a “real-life” industry experience in 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 then executing the plan. Throughout the two semesters, they are guided in technical areas by the subject matter experts, and mentored by the instructor 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. They 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.

Today we are celebrating the achievements of 61 students, who have diligently worked on 16 diverse industry problems.

This program is only possible with dedicated support from our sponsors and subject matter experts whom we whole-heartedly thank for their unwavering and dedicated support. Thank you for engaging with our program and helping make our students more valuable. We also 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,

GINO MANZO

*Two-Semester ECE Senior Design
Capstone Instructor
Professor of Practice*

The background features a complex, abstract design with overlapping geometric shapes, including squares and diamonds, and a network of lines with circular nodes. Some lines have arrows indicating direction. The design is rendered in a light gray color against a white background.

"This course is one of the best things that ever happened to me."

"This class has felt like a real capstone to my undergraduate career at Virginia Tech."

TODAY'S PROGRAM

11:00–11:30

SIGN-IN, REVIEW POSTERS

11:30–12:30

WELCOME—Prof. Gino Manzo

REMARKS—Luke Lester, Department Head

SHORT TEAM PRESENTATIONS

12:30–2:30

LUNCH, REVIEW POSTERS

2:30

BEST PAPER AWARD(S)

3:00

ADJOURN

***ALL GUESTS** are requested
to vote for a Best Paper*

EVERY VOTE COUNTS

"I saw practical applications of all the concepts that I learned in the school for the last three years."

"Working on a project from the proposal to competing analysis of tested data from fully manufactured final product we actually processed was just fascinating."

"No other class has given me such agency over my education and what I want to do with my studies."

OUR SPONSORS

With gratitude and appreciation for your dedicated support



General Electric



National Instruments



**General Motors/Virginia Tech
Transportation Institute**



Northrop Grumman



Intel



Prime Photonics



**The Johns Hopkins University
Applied Physics Laboratory**



Virginia Tech Information Technology



Lockheed Martin



Virginia Tech ECE



Micron Technology



VPT Inc.

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
GENERAL ELECTRIC, SALEM, Va. Rodney Clemmer, Michael Austin	SIMULTANEOUS PROGRAMMING OF MULTIPLE ID TAGS William Plymale
GENERAL ELECTRIC, SALEM, Va. Rodney Clemmer, Brian Batteiger	WEB-ENABLED HIGH VOLTAGE WAVEFORM GENERATOR Rolando Burgos
GENERAL MOTORS, DETROIT, Mich., WITH VTTI* Keith Van Houten, Zac Doerzaph	TEST TRACK EMERGENCY SHUT DOWN SYSTEM Carl Cospel
GENERAL MOTORS, DETROIT, Mich., WITH VTTI* Keith Van Houten, Zac Doerzaph	WIRELESS SENSOR INTERFACE FOR DATA ACQUISITION Walid Saad
INTEL, HILLSBORO, Ore. Sean King	RELIABILITY OF LOW K INTERCONNECT STRUCTURES Marius Orlowski
JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY, LAUREL, Md. Michael Newkirk, Jeffrey Nanzer	SELF-ORGANIZING COHERENT DISTRIBUTED RF TRANSMITTER Kwang-Jin Koh
JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY, LAUREL, Md. Michael Newkirk, Thomas Hanley	INFRARED SEA SURFACE TEMPERATURE SENSOR Scott Bailey
LOCKHEED MARTIN, DENVER, Colo. Ken Schulz, Slade Gardner	ASYMMETRIC MATERIAL DESIGN ANALOG CIRCUIT Louis Guido
LOCKHEED MARTIN, WASHINGTON, D.C. Ken Schulz, Sheldon Thomas	DATA STREAM COMPRESSION AND ENCRYPTION INTEGRATED CIRCUIT Michael Hsiao
MICRON, MANASSAS, Va. Zuzana Steen, Kevin Hicks, Thomas Joseph	DESIGN/FABRICATE/EVALUATE PHOTOVOLTAIC CELLS Luke Lester
NATIONAL INSTRUMENTS, AUSTIN, Texas Brian MacCleery	SENSORLESS MAGNETIC LEVITATION SYSTEM Haibo Zeng
NORTHROP-GRUMMAN, SAN DIEGO, Calif. Tony Roupael	HIGH SPEED SWITCH FABRIC: MODEMS TO TRANSCEIVERS Leyla Nazhandali
PRIME PHOTONICS, BLACKSBURG, Va. Steve Poland, Tim Winter, David Gray	FLUXGATE MAGNETOMETER DRIVE Hyomin Kim
VIRGINIA TECH ECE Jaime De La Ree	IEEE ROBOT Jacob Yacavelli
VIRGINIA TECH IT Scott Midkiff, Karen Herrington	MOBILE SINGLE SIGN ON Karen Herrington, Ernest Penland
VPT INC, BLACKSBURG, Va. Dan Sable	RADIATION TEST METHODOLOGIES, HARDWARE, TEST DATABASE Clay Rogers, Aridio Sanchez

**Virginia Tech Transportation Institute*

SPECIAL ACKNOWLEDGEMENTS

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.

ECE 4805-4806 GUEST SPEAKERS (IN ORDER OF APPEARANCE DURING THE YEAR)

CESARE CAPRIO

BAE Systems (retired)
Program Management, Resume Reviews, Mentoring

DENNIS SWEENEY

Virginia Tech—ECE
Design Studio Safety Training and Material Procurement Instruction

MICHAEL MILLER

Virginia Tech—Intellectual Properties
Innovation and Intellectual Property Management

THOMAS SOVA

New River Valley IP Law
Intellectual Property Issues for Recent Grads

KEN SCHULZ

Lockheed Martin
Ethics and Professionalism

TOBY MEADOWS

NAVAIR
Leadership

Thanks also to **NASSIM RAHIMI**—Teaching Assistant for the Intel and Micron projects—who provided excellent safety, tool, semiconductor processing, and mask design training.

PROJECT TEAMS

SIMULTANEOUS PROGRAMMING OF MULTIPLE IDENTIFICATION TAGS

General Electric

CHALLENGE:

Develop a device that can simultaneously program up to six integrated identification tags, and reduce programming time of existing devices. Create a PC-based interface for users to manipulate data stored in the ID tags.



Danny Mota, Arun Rai, Mohammad Islam, Xin Gan

DANNY MOTA

DOMINICAN REPUBLIC

Computer Engineering, interest in applied software design, human-machine interaction, and embedded systems

ASPIRATIONS:

Contribute as a skilled embedded system designer and software engineer.

CLASS COMMENT:

We learned project management and technical aspects of the project in an amazing and satisfying environment.

ARUN RAI

BLACKSBURG, Va.

Computer Engineering, interest in software design, wireless networks, and cryptography

ASPIRATIONS:

Contribute as a software engineer at SAIC. Pursue a graduate degree in engineering management and advance to a technical management position.

CLASS COMMENT:

Learning new tools to design and build a prototype is challenging, but rewarding. A great learning experience for self-motivated individuals.

MOHAMMAD ISLAM

WOODBIDGE, Va.

Computer Engineering, interest in software design and embedded system design

ASPIRATIONS:

Contribute as an embedded system design engineer at aerospace, defense, and space system industry. Obtain a graduate degree. Advance as technical manager.

CLASS COMMENT:

This class is a wonderful opportunity to resolve a technical project while understanding real life complexities.

XIN GAN

BLACKSBURG, Va.

Computer engineering with interest in embedded systems

ASPIRATIONS:

Contribute as R&D engineer at an innovative technology company. Pursue a graduate degree in computer architecture.

CLASS COMMENT:

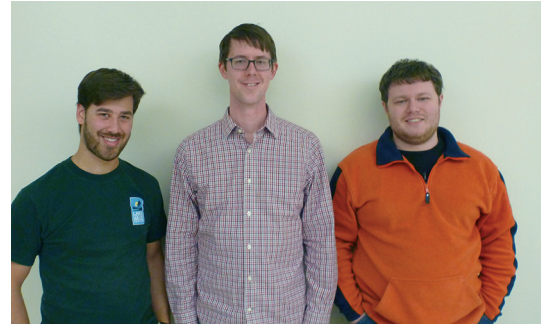
The class provides an opportunity to get a real-world work experience.

WEB-ENABLED HIGH VOLTAGE WAVEFORM GENERATOR

General Electric

CHALLENGE:

Design, build, and test specialized electronic equipment with a web page interface that can produce, read, measure, and analyze waveforms, then pinpoint any faults.



Jacob Pressman, Todd Rohrer, John Spataro

JACOB PRESSMAN

ASHEVILLE, N.C.

Electrical Engineering, minor in math

ASPIRATIONS:

Participate in the Edison Engineering Development Program through General Electric Transportation. Advance in the field of robotics.

CLASS COMMENT:

You may not always achieve high goals, but you will still achieve much more than if you set a low goal.

TODD ROHRER

HARRISONBURG, Va.

Electrical Engineering, focus on analog circuit design

ASPIRATIONS:

Pursue M.S. degree in electrical engineering at Virginia Tech and a career in audio electronics design.

CLASS COMMENT:

The best learning experiences throughout this design process have come in the form of setbacks and unexpected complications.

JOHN SPATARO

ROCKY MOUNT, Va.

Computer Engineering, minor in theatre

ASPIRATIONS:

Finish CPE degree and find a creative job in engineering. Start a business.

CLASS COMMENT:

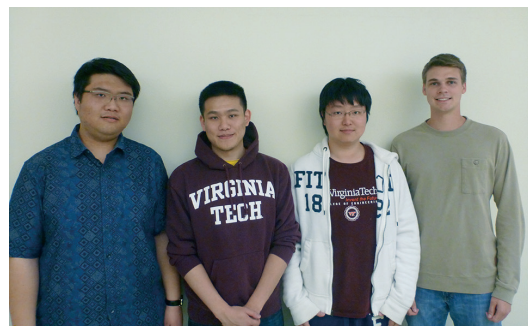
This project was a great experience, and even with those moments of failure, the moments of success were very motivating.

TEST TRACK EMERGENCY SHUTDOWN SYSTEM

General Motors and Virginia Tech Transportation Institute

CHALLENGE:

Create a system that sends a wireless signal from a remote location to shut off a vehicle in an emergency situation.



Sizhe Guo, Daniel May, Kuangzhe Xu, Mark Elliott

SIZHE GUO

BEIJING, CHINA

Electrical Engineering, minor in math, interest in integrated circuit design

ASPIRATIONS:

Earn M.S. degree then attend top 4 engineering schools for a Ph.D. Be an entrepreneur.

CLASS COMMENT:

The biggest challenge in engineering is to work with people of different backgrounds and experiences.

DANIEL MAY

FAIRFAX, Va.

Computer Engineering, interest in embedded systems

ASPIRATIONS:

Pursue M.S. degree. Create gaming peripherals that people will enjoy using.

CLASS COMMENT:

Everything takes more work than you expect, but nothing is impossible.

KUANGZHE XU

SHANGHAI, CHINA

Electrical Engineering, interest in Power Electronics and Analog IC Design

ASPIRATIONS:

Pursue graduate degree.

CLASS COMMENT:

Teamwork is important for every success.

MARK ELLIOTT

POINT PLEASANT, N.J.

Electrical Engineering, interest in embedded software and control systems

ASPIRATIONS:

Work for JLG Industries. Move into project management position.

CLASS COMMENT:

The senior design class is a great way to improve both technical and professional skills through the interactions and feedback of a real company.

WIRELESS SENSOR INTERFACE FOR DATA ACQUISITION

General Motors and Virginia Tech Transportation Institute

CHALLENGE:

Develop a reliable wireless interface between interface and signal transformation sensors, a DAS interface, radio signals, and a central data acquisition system. The sensors need to support a variety of common input interfaces.



Mihail Lolov, David Sussman, Eric Nissen,
Tilksew Ashagre, Rui Xu

MIHAIL S LOLOV

TAMPA, Fla.

Electrical Engineering, interest in power electronics

ASPIRATIONS:

Work as an electrical engineer for BMW.

CLASS COMMENT:

The best part of the class is working with my team on a real life project.

DAVID SUSSMAN

MEDFORD, N.J.

Computer Engineering, minor in Computer Science

ASPIRATIONS:

Work as a Software engineer on autonomous systems.

CLASS COMMENT:

It is pretty cool working on real life problems instead of toy projects.

ERIC NISSEN

CHARLOTTESVILLE, Va.

Electrical Engineering, interest in wireless communication

ASPIRATIONS:

Work for AT&T as a RAN Engineer and specialize in wireless communication.

CLASS COMMENT:

Hands down, the best part of this class is being part of a high functioning team of my peers.

TILKSEW ASHAGRE

WOODBIDGE, Va.

Electrical Engineering, interest in telecommunications

ASPIRATIONS:

Pursue a career in electrical engineering and live a balanced life.

CLASS COMMENT:

This senior design/capstone course helped me understand and develop leadership and high team functioning skills.

RUI XU

NANCHANG, CHINA

Electrical Engineering, interest in control systems and smart systems

ASPIRATIONS:

Work in a well known research institute for smart system design.

CLASS COMMENT:

This class helped me gain deep insight about how the industry, research, and academia work together. I also learned a lot of communication skills.

RELIABILITY OF LOW K INTERCONNECT STRUCTURES

Intel Corporation

CHALLENGE:

Develop a test and new test structures that will help to understand the nature of time-dependent dielectric breakdown (TDDB). Identifying what stressors induce TDDB will help improve semiconductor technology as it continues to scale.



Rajat Gupta, Gargi Ghosh, Paige Kassalen

RAJAT GUPTA

CLIFTON, Va.

Electrical Engineer, Computer Engineering

ASPIRATIONS:

Work as a Field/Project Engineer for ExxonMobil.

Obtain advanced degree in management or law.

CLASS COMMENT:

This industry driven senior design project was an excellent experience that provided me with an amazing opportunity to develop business, professional, and technical skills.

GARGI GHOSH

DURGAPUR, INDIA

M.S. Electrical Engineering, specialization in semiconductor devices and processing

ASPIRATIONS:

Become a valuable employee at Intel. Contribute back to the society as a consultant in India.

CLASS COMMENT:

This course is one of the best things that ever happened to me. We could actually have a tagline for this capstone course that says “where learning is fun.”

PAIGE KASSALEN

PITTSBURGH, Pa.

Electrical Engineering

ASPIRATIONS:

Work at Bayer.

CLASS COMMENT:

The best part of this class was having the opportunity to gain so many new experiences. I had never worked much with semiconductors, but had the opportunity to go into a clean room and fabricate samples.

SELF-ORGANIZING COHERENT DISTRIBUTED RADIO FREQUENCY TRANSMITTER

The Johns Hopkins University Applied Physics Lab

CHALLENGE:

Build a localization module that uses both wireless and ultrasonic transceivers to communicate with other nodes and determine range information. The goal is to achieve 90 percent of theoretical coherent gain at a specified location using localization, clock synchronization, and phase adjustment.

DUNCAN SELKIRK

CAPETOWN, SOUTH AFRICA

Electrical Engineering, interest in embedded systems

ASPIRATIONS:

Start my own software design firm.

CLASS COMMENT:

The most challenging part of this project has been long-term time management. I have found that properly planning this project over the course of a year has been difficult, but the experience has been very rewarding.

BENJAMIN CHAO

MANASSAS, Va.

Electrical Engineering, interest in RF and satellite communications

ASPIRATIONS:

Career with a government contractor or in the satellite communications industry. Pursue a technical management position.

CLASS COMMENT:

I loved participating in a group with such talented and knowledgeable peers, and I would like to thank them, as well as this project experience, for teaching me so many things I could never learn in a classroom.

JOE BRENDLER

FAIRFAX, Va.

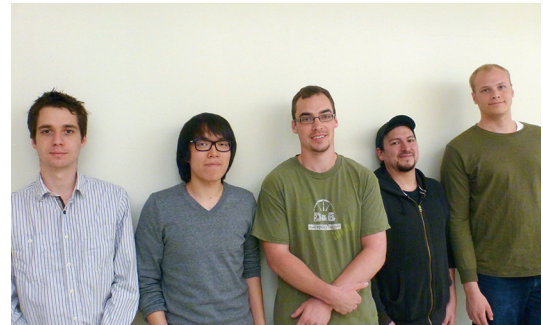
Electrical Engineering, specialization in RF hardware

ASPIRATIONS:

Work in military/defense R&D. Pursue M.S. degree through the Johns Hopkins University Applied Physics Lab.

CLASS COMMENT:

This class taught me that sometimes you just need to call it a day, and that preparation and organization are the keys to avoiding stress.



Duncan Selkirk, Benjamin Chao, Joe Brendler, Xaiver Gomez, Michael Gustavson

XAVIER GOMEZ

ALEXANDRIA, Va.

Electrical Engineering, interest in telecommunications and signal processing

ASPIRATIONS:

Contribute as a part of a team and continue learning from challenging projects. Enhance technical skills in digital image processing and telecommunications.

CLASS COMMENT:

The best part of this project was being able to work with and learn from talented people.

MICHAEL GUSTAVSON

FREDERICKSBURG, Va.

Electrical Engineering, interest in communication systems

ASPIRATIONS:

Work in home security and automation as a quality engineer for Alarm.com.

CLASS COMMENT:

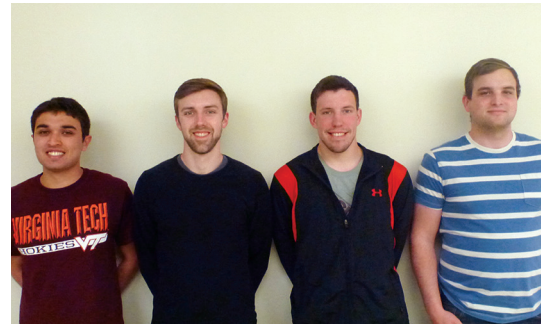
The biggest challenges for this project have been team communication and organization. At times, our meetings are less structured. This project has taught me to stay organized so that we all are on the same page.

INFRARED SEA SURFACE TEMPERATURE (SST) SENSOR

The Johns Hopkins University Applied Physics Lab

CHALLENGE:

Design a compact, inexpensive, low power, and highly accurate sensor to measure the infrared light reflected off the sea's surface. The sensor uses the IR spectrum to measure the relative emissivity of the light from water between 8-14 microns (longwave infrared).



Ryan Nour, Joel Lasher, Eric Hoffman, Josiah Walczuk

RYAN NOUR

STERLING, Va.

Computer Engineering, specialization in network engineering and network programming

ASPIRATIONS:

Work as a network engineer for the government. Become a technical manager.

CLASS COMMENT:

I enjoyed applying in-class knowledge to a real world problem in a professional environment. I learned a good amount about collaboration and team work throughout the course.

JOEL LASHER

SWOOPE, Va.

Electrical Engineering, focus in telecommunications

ASPIRATIONS:

Develop enhanced networking hardware. Work in RF transmission design.

CLASS COMMENT:

In this class I had the opportunity to lead a team, gained mentors, and worked with an outstanding company. This class was an invaluable real-world experience, and I was able to apply many of the skills I have learned.

ERIC HOFFMAN

FREDERICK, Md.

Electrical Engineering, focus in power systems

ASPIRATIONS:

Work as a power engineer at Dewberry Engineering. Lead a power distribution design team as a project manager.

CLASS COMMENT:

This class has opened my eyes to real world deadlines and how stressful they can be. It has also allowed me to understand how a team needs to work for success.

JOSIAH WALCZUK

WOODBIDGE, Va.

Electrical Engineering, interest in control systems

ASPIRATIONS:

Gain knowledge and experience as an Electrical Engineer at the Norfolk Naval Shipyard.

CLASS COMMENT:

This class has taught me the importance of being the best team member that I can be in any shape or form.

ASYMMETRIC MATERIAL DESIGN ANALOG CIRCUIT

Lockheed Martin

CHALLENGE:

Identify new materials that can be used to build basic circuit components and catalog those materials into a database. Design circuits with those new components implemented.



Vieny Nguyen, Michael Cwietniewicz, Riley Hassell

VIENY NGUYEN

LANSDALE, Pa.

Electrical Engineering, interest in power system design and computer networking

ASPIRATIONS:

Work in a challenging environment as an engineer. Earn an MBA.

CLASS COMMENT:

The best part of class was being able to interact with a real customer and subject matter expert. The scope of the class reached beyond just our technical skills and exposed us to professional and business aspects of industry.

MICHAEL CWIETNIEWICZ

WEST GROVE, Pa.

Electrical Engineering, interest in circuit design, control systems, and software engineering

ASPIRATIONS:

Expand both my hardware and software skills to build cool robots.

CLASS COMMENT:

The class was great because it gave us exposure to the business world that no other class has offered. While we are behind where we expected to be at this point, we are proud of the effort we put into the class and gained valuable experience.

RILEY HASSELL

PITTSBURGH, Pa.

Electrical Engineering, focus in power systems design and PLC programming

ASPIRATIONS:

Work as an engineer while earning an M.S. degree.

CLASS COMMENT:

The way this course was taught gave each person practice in the business, technical, and professional worlds. The hardest part of this class was that our project was so open ended. It was unlike any other class since there were numerous different directions we could have gone.

DATA STREAM COMPRESSION AND ENCRYPTION IC

Lockheed Martin

CHALLENGE:

Develop a field-programmable gate array based solution to take a stream of variably formatted data, compress it to reduce memory storage requirements, and encrypt it to meet Triple Data Encryption Standards.



Clarke Austin, Curtis Einsmann, Alex Clarke

CLARKE AUSTIN

YORKTOWN, Va.

Electrical Engineering, interest in FPGA design

ASPIRATIONS:

Begin career as a systems engineer for Northrop Grumman.

CLASS COMMENT:

The chance to work on a year long project in a professional environment was a great experience that will help prepare me for industry.

CURTIS EINSMANN

WOODBIDGE, Va.

Computer Engineering, interest in software applications and embedded systems

ASPIRATIONS:

Work as a software development engineer for Amazon.com in the Amazon Web Services Security department. Pursue management opportunities.

CLASS COMMENT:

The most challenging part of the class is getting accustomed to the freedom of choosing your own deadlines for project deliverables and consistently meeting those deadlines.

ALEX CLARKE

VIRGINIA BEACH, Va.

Computer Engineering, interest in embedded systems and hardware design

ASPIRATIONS:

Maintain a long, productive career while starting a family.

CLASS COMMENT:

The class is very open-ended and there is a lot of freedom to design creatively. The difficult part is that there is no structure, and sometimes the team is unsure where to proceed next.

DESIGN/FABRICATE/EVALUATE PHOTOVOLTAIC CELLS

Micron Technology

CHALLENGE:

Fabricate a set of thermo-photovoltaic cells designed to extract energy from the heat of propane combustion. The design should have a lower resistance and higher efficiency than previous, similar projects.

BENJAMIN CONLON

WESTWOOD, N.J.

Materials Engineering with specialization in semiconductor devices

ASPIRATIONS:

Work in the development of solar panels and renewable energy.

CLASS COMMENT:

This class has felt like a real capstone to my undergraduate career at Virginia Tech. I felt as though this class exposed me to a real world project and allowed for interactions with customers and subject matter experts.

CHAN PARK

SEOUL, KOREA

Electrical Engineering with interest in Circuit design

ASPIRATIONS:

Gain more experience in circuit design and applications.

CLASS COMMENT:

I enjoyed every single bit of the project, even the challenges I encountered with the team. We worked on a project from proposal to analysis of tested data from the fully manufactured final product we actually processed.

CHARLES W. BARKER IV

CLIFTON, Va.

Electrical Engineering with an interest in satellite operation

ASPIRATIONS:

Work in space technologies.

CLASS COMMENT:

This has been the most immediately rewarding class I have taken at Virginia Tech. No other class has given me such agency over my education and what I want to do with my studies.



Benjamin Conlon, Chan Park, Charles Barker IV, Peter Barbieri, Donald Erb

PETER BARBIERI

EASTCHESTER, N.Y.

Materials Engineering with a focus on semiconductors

ASPIRATIONS:

Work in semiconductor device design or processing.

CLASS COMMENT:

I'm really grateful that I had the opportunity to take this course. Working in the clean room and working along with Micron helped make my year.

DONALD ERB

ELKTON, Va.

Materials Science and Engineering, interest in ceramic materials

ASPIRATIONS:

Contribute to materials processing research as a graduate student at Virginia Tech.

CLASS COMMENT:

Getting the opportunity to work in the cleanroom and work on a year long project was the most rewarding part of my undergraduate career.

SENSORLESS MAGNETIC LEVITATION SYSTEM

National Instruments

CHALLENGE:

Achieve permanent magnetic levitation with a six-inch, 15 lb. magnet. Use an FPGA to simulate the process and which can also act as a control system with a working prototype.

WES HOLCOMBE

MOSELY, Va.

Electrical Engineering, Automation

ASPIRATIONS:

Apply FPGA and power electronics knowledge to factory and machine automation.

CLASS COMMENT:

Anything problem can be fixed, simple or complex, you just have to open it up and find out.

SUJIT S. SAMUDRE

CHESAPEAKE, Va.

Computer Engineering with interest in Large-Scale Software Development

ASPIRATIONS:

Work with a large engineering team in the Hampton Roads area in Virginia.

CLASS COMMENT:

The best part about this class was learning and working efficiently with a team. Having this experience now will benefit future projects.

PEIXUAN WANG

TIANJIN, CHINA

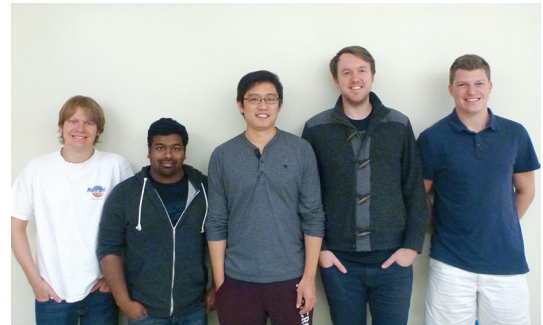
Electrical Engineering, interest in analog integrated circuit design

ASPIRATIONS:

Focusing on Analog ICs in graduate school.

CLASS COMMENT:

Working on a two-semester project about a real-life issue is a significant experience for my future.



Wes Holcombe, Sujit Samudre, Peixuan Wang, Adam Thompson, Jake Glaser

ADAM THOMPSON

BLACKSBURG, Va.

Electrical Engineering, specialization in power systems

ASPIRATIONS:

Earn M.S. degree at Virginia Tech. Pursue career in power generation and distribution to integrate sustainable energy sources into the grid.

CLASS COMMENT:

Apparently it takes 10 Amperes through a 14 AWG coil to make your dreams fly!

JAKE GLASER

ALEXANDRIA, Va.

Electrical Engineering, interest in architecture enterprise and satellite communication control

ASPIRATIONS:

Work as a Systems Engineer at ATCorp. Advance into management position.

CLASS COMMENT:

This is an extremely productive class which places students in a “real-world” position. We also developed teamwork and team leadership skills.

HIGH-SPEED SWITCH FABRIC: MODEMS TO TRANSCEIVERS

Northrop Grumman

CHALLENGE:

Develop a switch able to route signals from N antennas to M receivers and create a working model in Simulink. The signal generator will produce an analog signal, which is then translated to digital, modified by a field programmable gate array, retranslated to analog, and then processed by a signal analyzer.

Ehte Mohammed

GREAT FALLS, Va.

Electrical Engineering, focus in Analog/RF IC design

ASPIRATIONS:

Become a better engineer every day.

CLASS COMMENT:

This class was a great learning experience from a technical and a professional standpoint. I learned a great deal about project management and project scheduling. This class is inspiring me to seek a management position at some point in my career.

Nicholas W. Grubaugh

WEST CHESTER, Pa.

Electrical Engineering, interest in FPGA implementation

ASPIRATIONS:

Obtain MBA degree and work as a manager in an engineering firm.

CLASS COMMENT:

This design class is my first true look into the environment I will be working in when I graduate. I learned the best strategies for establishing an effective team, and the signs to watch for in ineffective teams.

Noah De La Hunt

GOODE, Va.

Electrical Engineering, focus in networked electronics

ASPIRATIONS:

Learn new skills wherever I go.

CLASS COMMENT:

I learned in this class the potential for greatness of an effective team, and how unproductive ineffective teams can be.



Ehte Mohammed, Nicholas Grubaugh,
Noah De La Hunt, Derek David, Diem Phan

Derek David

LEESBURG, Va.

Electrical Engineering, focus in signal processing, remote sensing, and hardware/software integration

ASPIRATIONS:

Earn M.S. degree and advance into technical management position at an engineering firm.

CLASS COMMENT:

I really enjoyed this class, because it taught me how to go through the full engineering process from proposal to final product. It also taught the challenges of working in a team and how to make your team more effective.

Diem Phan

ROANOKE, Va.

Electrical Engineering, concentration in Analog and RF IC design.

ASPIRATIONS:

Earn M.S. degree.

CLASS COMMENT:

Being of a part this class was a great experience to explore more about how to deal with project management, how to work in a team effectively, and how to deal with unexpected situations that might occur some points during the project.

FLUXGATE MAGNETOMETER DRIVE

Prime Photonics

CHALLENGE:

Create a device that measures the strength of a magnetic field. This device, the fluxgate magnetometer, will be used to test the new core material developed by Prime Photonics for NASA.



Britt Hager, Zachery Condon, Jay Sheth

BRITT HAGER

SALEM, Va.

Electrical Engineering, minors in business and math

ASPIRATIONS:

Work as a REACH engineer at International Paper. Earn MBA.

CLASS COMMENT:

This course was an excellent way to learn the basics of how a real project would work in an engineering company. It taught us so much that we wouldn't have learned in a traditional class.

ZACHERY CONDON

NEW WINDSOR, Md.

Computer Engineering

ASPIRATIONS:

Work as a Junior Engineer at LSA (Land, Sea and Air) Autonomy. Earn M.S. degree.

CLASS COMMENT:

This class gave me a chance to design a project and goals that would be directly applicable to where I intend to work.

JAY SHETH

FALLS CHURCH, Va.

Electrical Engineering, minors in computer science and math

ASPIRATIONS:

Earn M.S. degree at Virginia Tech. Pursue career in testing and designing ICs.

CLASS COMMENT:

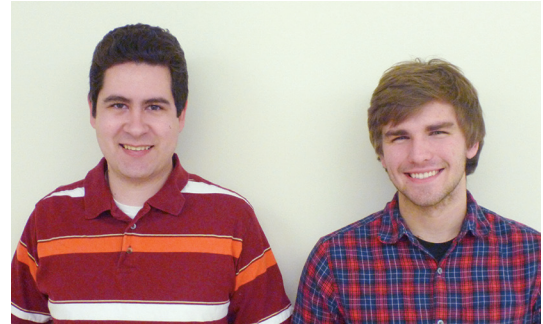
The class gave me a real life experience of working in the industry. I designed the circuit for a fluxgate magnetometer from scratch, and I saw practical applications of all the concepts that I learned in the school for the last three years.

IEEE ROBOT

Virginia Tech Electrical and Computer Engineering

CHALLENGE:

Design an autonomous robot with sensing, learning, and reading capabilities. The robot must be able to play games, navigate a maze, and complete tasks within an allotted time frame.



Matthew Peak, Eric Hahn

MATTHEW PEAK

HAMPTON, Va.

Computer Engineering, focus on robot control and design

ASPIRATIONS:

Help design and build a robot that can be used in daily life.

CLASS COMMENT:

Working with other people in a real world scenario has provided invaluable experience for the future.

ERIC HAHN

CHARLOTTESVILLE, Va.

Computer Engineering, interest in robotics

ASPIRATIONS:

Develop a product that combines multiple areas in ECE to help those interested in learning.

CLASS COMMENT:

Watching students grow throughout the year, having those eureka moments, and present what they've learned reminds me just how awesome the scientific and engineering community is here at Virginia Tech.

MOBILE SINGLE SIGN-ON

Virginia Tech Information Technology

CHALLENGE:

Create a mobile app that gives the user permission to use and access every app within an organization with a single sign-on. The app will also provide greater security and ease of use.



Zack Bubb, Cameron Spiller,
Nathan McCloskey, Christopher Dorick,

ZACK BUBB

GERMANTOWN, Md.

Computer Engineering, minor in computer science, focus on software development

ASPIRATIONS:

Work at Hughes Network Systems while continuing my studies in Computer Software.

CLASS COMMENT:

This was a very unique class that gave students a lot of freedom to work on and complete a real life project on their own, while working with a customer to learn how the software development process works in industry.

CAMERON SPILLER

BROOKLYN, N.Y.

Computer Engineering, specialization in web applications

ASPIRATIONS:

Intern at TripleLift in NYC, then finish undergraduate degree.

CLASS COMMENT:

I enjoyed the openness and willingness of the customer to allow us to approach the problem in the way that we wanted.

NATHAN MCCLOSKEY

HOUSTON, TEXAS

Computer Engineering, Computer Science

ASPIRATIONS:

Work at Amazon in New York City.

CLASS COMMENT:

I really enjoyed operating in a class like this that gave students much more freedom than any other college type lecture.

CHRISTOPHER DORICK

MANASSAS, Va.

Computer Engineering, minor in professional writing, interest in internet security

ASPIRATIONS:

Work in industry while earning M.S. degree in internet security.

CLASS COMMENT:

This class really helps students get a glimpse into the industry side of their major. Making it two semesters as opposed to one really helps the students feel committed to the project as well.

RADIATION TEST METHODOLOGIES, HARDWARE, TEST DATABASE

Virginia Tech Information Technology

CHALLENGE:

Design, build, and test a universal characterization circuit that can test any operational amplifier to reveal the amplifier's current parameters. The intended use is during radiation testing, where a component is irradiated, its parameters change, and the testing system can measure the operational amplifier for its new values.



Ali Majd, Michael Wood

ALI MAJD

LANSDOWNE, Va.

Electrical Engineering, Computer Engineering, interest in digital electronics and embedded systems

ASPIRATIONS:

Work as a designer for the Boeing Company. Earn M.S. degree.

CLASS COMMENT:

This class has had its ups and downs, but it has been a great experience nonetheless. It has helped me learn things that I would have never learned in any other course during my undergraduate years at Virginia Tech.

MICHAEL R. WOOD

WARRENTON, Va.

Electrical Engineering, interest in test engineering

ASPIRATIONS:

Work as a Test Engineer at VPT Inc.

CLASS COMMENT:

This class provides, for many, their first experience working on a project in groups with a set deadline. It balances the technical responsibility each member feels with the need to please their customer.

MANY PEOPLE CONTRIBUTED TO THIS PROGRAM
THAT WE WANT TO ACKNOWLEDGE AND THANK:

LUKE LESTER

for his vision and unyielding support to make this class available for students.

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