Fall 2012 GT Honors Program Special Topic Courses

**COC 3803 HP**  
*Engineering your Life for a 21st Century World*  
Merrick Furst & Andy Fleming  
W 3-6

This course will help students take charge of their lives in more effective and satisfying ways. Through experimentation and practice with leading edge principles and frameworks related to entrepreneurship and human development—and immersion in an intensive mentoring environment—students will learn how to deliberately shape their lives to (1) create value, (2) connect with others, and (3) develop themselves. Students will be expected to construct and conduct experiments every week related to these objectives and to share their results and learning with fellow students, the professors, and select guest-speakers/mentors. Additionally, students will complete selected readings, write two short reflection papers, and make a final “public” presentation to which they may invite guests.

**COE 3002 HP**  
*Intro to Microelectronics & the Nanotechnology Revolution*  
John Cressler  
TR 4:30-6

This course will expose UG students with little or no ECE background to a high-level understanding of the microelectronics and nanotechnology revolution and its global impact on both technology and society. Engineering, management, and science students will comprise the class, and by its nature it will be highly interdisciplinary in its appeal.

**ECE 2803 HP**  
*How Does SIRI Know? Audio & Video Processing*  
David Anderson  
TR 9:30-11

"Any sufficiently advanced technology is indistinguishable from magic." (Arthur C. Clark) Are smart-phones magic? Smart-phones are the meeting place of art, science, engineering, psychology, business, and entertainment. Although much of the improvement in handheld processing is a result of advances in semiconductor technology, many of the breakthroughs in science that have enabled our handheld multimedia revolution are founded in a study of how we hear and see and speak and other, equally important advances, are a result of improved algorithms for manipulating sound and images. We will explore the science, art, and magic behind smart-phones: speech recognition, music compression, image and video cameras and playback, and even phone calls.

**GRMN 4813 HP**  
*The Burden of the Past*  
Frank Pilipp  
MW 5-6:30

In this course, *The Burden of the Past: Memory, Accountability, and Soul-Searching in German and American Film*, students will examine recent films (of the past two decades) from Germany as well as some from the U.S. about historical events that have had an impact that contemporary society continues to try to come to terms with. The Holocaust, slavery, the expropriation of native Americans, the deprivation of civil and women’s rights have not only been of utmost historical significance but also long-standing topics in film and literature that still cause public debates and controversies today.

**INTA 4803 HP**  
*Democracy 2.0*  
Peter Brecke  
TR 3-4:30

This course is about governance. It starts with the premise that governance should be thought of as a particular organizational technology that functions to provide things that we as members of a society would like to have. These things include security, freedom, prosperity, social mobility, justice, and participation. The course is about how to improve the technology. The course begins by exploring the emergence of governance about 5000 BCE and
the forms it has taken moving towards the modern era. We will focus on democracy and the different types of democracies that societies have developed. Then we shift to designing a better form of democratic governance. As an example, we will explore a particular form called Democracy 2.0 that has built into it the capability to change—and hopefully improve—our governmental structures, so that our system of governance functions better than it does now.

PHIL 3127 (PUBP 4803) HP Biotechnology Law, Policy, and Ethics Roberta Berry MW 3-4:30
This course examines challenging issues in biotechnology law, policy & ethics through multi-disciplinary course readings. The course employs an active-learning, seminar-style approach, with panels of students assigned to write and present short papers addressing the class readings. Class discussion centers on the papers presented each class. Issues addressed may include neuroimaging technologies, brain-machine interface technologies, nanotechnologies, human cloning, human genetic engineering, patenting of genes/life, genetically modified foods, DNA identification for forensic and other purposes, synthetic biology and the creation of cellular machines. All course readings will be posted on electronic reserves or available on the Web; there will be no assigned text.

PSY 2803 HP Psychology of Creativity and the Arts Paul Verhaeghen TR 9:30-11
This course is meant to provide an overview on what ‘scientific’ psychology can tell us about the creative person and the creative process. You will soon learn that we know some important things, but that we seem to know very little about what probably most interests you: where does my own creativity come from, and what can I do to become more creative? This is clearly not a DIY-creativity-enhancement course (and you will learn why it isn’t). In a way, this class is a journey without end and a quest without answers, but we may glean some (hopefully) interesting vistas along the way. The main goal is not to bombard you with tidbits of information (though that will happen) but to get you thinking, critically, about the creative process in general and maybe your own creativity in particular. At the least, the course should provide you with the insight that creativity is hard to fathom, and give you a sense of how awesome and strange your own creativity and that of other people really is.

New Category: CASE studies: Connecting Academic and Societal Experience
The purpose of these courses is to create opportunities for Georgia Tech undergraduates to develop meaningful research and service relationships with partners external to Georgia Tech, whether in Atlanta or elsewhere—preferably non-profit, community-based organizations, that work, as Georgia Tech itself aspires to do, to improve the human condition.

HTS 2803 HPC Semester in the City: Engaging English Avenue Greg Nobles & Chris Burke TR 3-4:30
This mind-on/hands-on service-learning course invites students to explore how an urban neighborhood works – and equally important, to begin working in that neighborhood. We will focus on the English Avenue community, just adjacent to the west side of Georgia Tech, a neighborhood facing serious challenges but also developing significant strategies for change. Looking at English Avenue from a variety of perspectives – historical, social, political,
economic, and environmental, among others – we will seek to understand the community on its own terms, but also study it within the larger context of the city of Atlanta.

**EAS 2803 HPC The Urban Forest**  
Monica Halka  
TR 1:30-3

When you think of a city, what’s the first thing that comes to mind? Probably not “forest,” but many urban problems—such as smog and elevated summer temperatures—could be alleviated if people would get into that mindset. Trees minimize the heat island effect and halt soil erosion. They absorb air pollutants and harbor native birds. Atlanta’s numerous fruit trees provide food that can be distributed to the city’s needy. In partnership with *Trees Atlanta*, this course will explore these aspects—and more—of what our urban forest does for our extended community and what we can do to help both thrive. Scientific, economic, social, and environmental aspects will be explored.

**Spring 2012 GT Honors Program Special Topic Courses**

**LCC 3226 HP You Don’t Know Moby Dick: Melville and 19th-Cent. Technology**  
Hugh Crawford  
T R 9:30-11

Herman Melville's classic novel is much more than a ripping seafaring yarn; it is also a compendium of nineteenth-century technologies. We will use a studio model for humanities education to explore *Moby-Dick*, alternating between discussions of the text (and some related materials), and working in the studio devising forms of mediation, making models from a range of materials, and perhaps fabricating full-scale artifacts—all with an eye toward a fuller understanding of both material practices and concepts about hands-on learning. Students’ focus on various materials and practices will determine the overall trajectory of the class, but we will likely do a little carpentry and maybe even some blacksmithing.

**COA 4803 HP Design Think Design Do: Exploring Design Across Disciplines**  
Sabir Kahn et al  
T R 1:30-3

What is design? How does one do it? Is doing design similar to doing science? Or engineering? Or art? Or is design its own thing? An activity and a mindset that approaches the world with its own goals, tools, and procedures? We will explore these questions by doing design—short deep dives and extended engagements with a range of problems—and by taking design apart—careful, considered, and speculative unpacking of a wide range of exemplary designs. We will immerse you into design within, across, and in-between the disciplines and majors that exist across campus. In the process you will see how design may both humanize technology and help us take on complex problems that cross scales and systems. Our goal for you is to help you develop design literacy and agency—both an awareness of and an ability to participate in the challenges, pleasures, and possibilities of doing and thinking design. Our goal for ourselves is to test, develop, and co-design a course that would be the portal into the interdisciplinary design minor being developed for students at Tech. Help us answer: *What should be in our collective design tool-set?*

**INTA 4830 HP What makes us safe? The Nature of National Security**  
Jarrod Hayes  
T R 3-4:30

In the post-September-11th world, the concept of security has taken on renewed importance. In the United States, the discourses of security permeate everyday life. But we rarely stop to think about what security is, and how security varies within and across societies. This course will challenge you to critically examine the concept of security and the role it plays in society. To that end, the course has two central goals. The first is to explore the
national security concerns and perspectives for the major countries and regions of the world. The second is to understand the connection between alternative constructions of national security and the security policies of nation-states. This course will fundamentally change your understanding of national security.

**HTS 3813 HP Witness to a Changing Conscience: Writing and Personal Transformation** Ken Knoespel/ Bruce McEver R 3-6
This seminar is devoted to the study of writers whose works have shaped our discourse of what it means to truly be a human being in the world of others. After considering a cluster of seminal writing often referred to as ‘confessions,’ we will turn our attention to writing that witnesses to fundamental transformations in individual moral consciousness in a world rapidly being transformed by scientific and technological development. Students will write three short papers. Since the course will be run as seminar, students will also be expected to give regular presentations on assigned readings in class. It is also assumed that students will meet regularly with the course instructors.

**ISYE 4803 HP Gridlock: Extremism in American Politics** Craig Tovey M W 12-1:30
If you are interested in U.S. politics and the future of our country, this course is for you. The U.S. Congress is more polarized by extreme views than it has been in 100 years. The results are legislative gridlock, the postponement of meaningful decisions, and an all-time low public approval of Congress of 14%. But the U.S. population is not nearly as polarized. Why are the views of the majority of U.S. citizens not represented in Congress? What can we do about it? We will use legislative roll-call and polling data to quantify the extremism of Congress compared to the U.S. population, and find reasons why they differ. Then you, working singly or in small teams, will suggest cures for polarization. We will hold mock-debates to critique, refine, and improve these cures. Course participants should be capable of both analytical and creative thinking, and able to hold their own in group discussions and debates.

**ME 3141 HP Cutting-Edge Technologies** David Ku T R 4:30-6
This seminar-style course investigates the background and primary sources of advanced engineering technologies. The goal is for students to gain a familiarity with some of the most advanced research addressing major technological challenges of today. We will discuss journal papers on Tuesdays in a lay-friendly manner to get beyond the math. Thursdays will consist of guest speakers that will include distinguished GT faculty and researchers from around the world, invited to present their work to a non-technical audience.

**LCC 3823 HP2 All the Live-Long Day: Literature about Livelihood** Catherine Murray-Rust T R 1:30-3
Adults spend most of their waking hours at work, but little is written about what work means to those who do it every day. Do people view their work as a job, a career, a calling? Is it possible or even desirable as many Americans believe to separate one’s personal life from one’s work life? Do younger people have different connections to work than previous generations? Through reading such books as Studs Terkel’s *Working*, and Joshua Ferris’s *Then We Came to the End*, students in the class will explore these questions and many more. Writing assignments will include short essays. Students will learn how to conduct informational and longer interviews with people who work in a variety of occupations from humble to high-status. They will present their interview reports in an open forum at the end of the semester.

This course will address the importance of technology innovation and the integration of technical, budgetary and policy issues in the framing of the U.S.
civilian aerospace economy. Course material will cover the challenges and fundamental physics of aerospace engineering, the historical development of aerospace capabilities, and budgetary and policy aspects of this sector. There are no pre-requisites for this class. Students will be expected to review and understand current-events aerospace literature, and will develop a significant technology policy paper and debate its merits. Students will also interact with invited professionals from the aerospace technology and policy. The class will participate in aerospace Congressional visits week in Washington, DC.

**EAS 2803 HP**  
**A Balance of Power: Energy, Environment & Society**  
Kim Cobb  
T R 3-4:30  
Anthropogenic global warming and energy security concerns have made the search for affordable low-carbon energies a local, national, and international priority. The path towards alternative energy infrastructures for the 21st century requires careful consideration of economic, environmental, technological, and political factors. This interdisciplinary seminar-style course will blend current events, guest speakers, lively discussion, and a diverse array of literature to separate fact from fiction in the heated debate concerning our nation's climate and energy future. The main student activity will be a semester-long ‘Carbon Reduction Challenge,’ wherein student teams compete to reduce carbon footprints by the semester’s end.

**LCC 3823 HP**  
**Harry Potter and the False Dichotomy of Good & Evil**  
Monica Halka  
T R 1:30-3  
At first glance, the Harry Potter saga seems to incorporate well-defined camps of good-doers and evil-doers. As in: Dumbledore=Good; Voldemort=Bad. Closer scrutiny, however, reveals that things are not quite so clear-cut. As such, this recent, wildly popular literature serves as an ideal springboard for exploring the most ancient of intellectual conflicts. Students will attempt to parse the meaning of good and evil in various contexts and timeframes. Through the lens of J.K. Rowling’s narrative, we will explore notions from world religions and Buddhist philosophy to the Salem witch hunts, WMD’s, and the mask of the psychopath. What is good? What is evil? How do we know? Where do we draw the line?

**Fall 2011 GT Honors Program Special Topic Courses**

**ARCH 4803 HP**  
**The Physics and Metaphysics of Premodern Architecture**  
Laura Hollengreen  
R 1:35-4:25  
This course will present students with an opportunity to investigate key built works of the past as exemplars of material and structural innovation, often realized at overwhelming and mystifying scale; of calculated environmental response; and of meaning production. It will charge them with defining a “poetics” of architecture in various periods of the past, such that they elucidate the successful linkage of physical achievement in built form and metaphysical significance in cultural interpretation that marks all great works. Together, the works studied will allow the class to formulate and test a proposition about the dialectic of tangible and intangible in what we call “architecture”. There will be a range of building types and cultures included.

**COE 3002 HP**  
**Intro to Microelectronics & the Nanotechnology Revolution**  
John Cressler  
T R 4:30-6  
This course will expose undergraduate students with little or no ECE background to a high-level understanding of the microelectronics and
nanotechnology revolution and its global impact on both technology and society. Engineering, management, and science students will comprise the class, and by its nature it will be highly interdisciplinary in its appeal.

HTS 3803 HP  Georgia Tech: The Making of a Modern University  Greg Nobles & Randy McDow  T R 3-4:30
How did Georgia Tech get to be the way it is today? How—and how well—does the Institute operate? What is Tech’s impact on the world, the nation, and the immediate neighborhood? Where is it going in the future, and who will determine how to get it there? To answer these and many other questions, this course will look at the development of Georgia Tech over time, beginning in its earliest days in the 1880s and focusing particularly the past fifty years, since 1961. In doing so we will meet up close and personally with some of Tech’s main movers and shakers—senior administrators in the Carnegie Building and the six colleges, significant figures in research, teaching, sports, and campus life—and some of the behind-the-scenes people who help get things done. Along the way we’ll raise questions about what Tech means to its students, alumni, professors, and other employees and, above all, what we hope it will mean to you in the future.

ISYE 4803 HP  The Use and Misuse of Data  Donna Llewellyn and David Goldsman  T R 1:30-3
We will investigate two main topics in this course: 1. The Use of Data – how to take complex questions and break them down in order to start modeling them and estimating their solutions. One example might be the question: “Is it worth spending the extra money to buy a hybrid or alternative fuel car?” Or “How many doctors and staff should be on call at a local hospital on any given night?” – what numbers do you need to start to answer these kinds of questions, where do you get those numbers, and what do you do with them? If you need to collect data, how much is enough? 2. The Misuse of Data – how do pollsters, advertising and marketing agents, and others misuse basic statistics and other data to make their points? We will read the book “Proofiness” and study the darker side of statistics. This class will be interactive and taught as a joint inquiry investigation into the topics listed. Students will do projects studying these topics as they relate to their own academic or personal interests.

LCC 3803 HP  Coffee, Tea, & Chocolate: Why They’re So Good, Why They’re So Bad  Monica Halka  T R 1:30-3
This course will explore the science, technology, economics, and cultural legacy of these three legal and delicious, but addictive substances. The history of human craving for these products—worth billions of dollars in imports to the United States annually—is rife with mystery and intrigue. Students will have the opportunity to read about and discuss such questions as: Is chocolate really beneficial to your health? What was the role of tea in the Boston Tea Party? Why does coffee smell so good? What does anything have to do with the price of tea in China? There will be tastings.

MATH 4803 HP  Combinatorial Game Theory  Tom Morley  MWF 9-10
Combinatorial games are two player games without chance moves (shuffling, dice, etc.). They are often encountered in mathematical puzzles, but they are also of interest in computational complexity and applications. They also provide the foundation for the surreal numbers. In this course we will study combinatorial games, starting with Nim and Hackenbush, and include take away games, chomp, ordinal numbers and infinitesimals. There are many open conjectures, and we will explore these computationally.

PSY 2803 HP  Psychology of Creativity and the Arts  Paul Verhaeghen  T R 9:30-11
This course is meant to provide an overview on what ‘scientific’ psychology can tell us about the creative person and the creative process. You will soon learn that we know some important things, but that we seem to know very little about what probably most interests you: where does my own creativity
come from, and what can I do to become more creative? This is clearly not a DIY-creativity-enhancement course (and you will learn why it isn’t). In a way, this class is a journey without end and a quest without answers, but we may gleam some (hopefully) interesting vistas along the way. The main goal is not to bombard you with tidbits of information (though that will happen) but to get you thinking, critically, about the creative process in general and maybe your own creativity in particular. At the least, the course should provide you with the insight that creativity is hard to fathom, and give you a sense of how awesome and strange your own creativity and that of other people really is.

Spring 2011 GT Honors Program Special Topic Courses

**CS 4475 HP  Computational Photography  Irfan Essa  TR 1:30-3**
This course will explore perceptual and technical aspects of pictures, and more precisely the capture and depiction of reality on a 2D medium. The scientific, perceptual, and artistic principles behind image-making and image-capturing will be emphasized. We will primarily focus on how computation and related technologies have completely transformed the process and workflow of photography. Overall, students will use photography to learn technical aspects of computer vision and image processing, in addition to basic photography techniques. Group and individual projects will be assigned for students to capture content on campus and around Atlanta and use them in their projects.

**CHEM 2803 HP  Bright and Smart: Organic Materials for Electronics and Photonics  Jean-Luc Bredas  TR 9:30-11**
This course is intended to introduce highly-motivated undergraduate students to the emerging field of organic electronics and photonics, via an understanding of the electronic and optical properties of organic materials provided namely by carrying out simple but informative molecular modeling calculations and simulations. The course highlights an interdisciplinary approach to these organic materials. Each of the topics will include elements related to the chemical, optical, and/or electrical properties of the materials, their characterization, their device fabrication, and their current or expected applications in the market place.

**COE 3002 HP  Introduction to Microelectronics & the Nanotechnology Revolution  John Cressler  TR 4:30-6**
This course will expose students with little or no ECE background to a high-level understanding of the microelectronics and nanotechnology revolution and its global impact on both technology and society. Engineering, management, and science students will comprise the class, and by its nature it will be highly interdisciplinary in its appeal.

**ECE 2803 HP  Learning from Disasters: Exploring Society/Technology Interactions  Joseph Hughes  MW 4:30-6**
Major disasters – like the Gulf oil well explosion, the Minneapolis bridge collapse, and the devastation of Hurricane Katrina – remind us of modern society's dependence on technology and of the potential for human calamity when technology fails. This course will use failures, disasters, and current issues (e.g., energy independence, Gulf Coast reconstruction, climate change) to motivate the study of both technical and social implications of technological dependence. The seminar will span and integrate technical and humanistic topics, including interactions among political, economic, and social factors; models for risks and ethical decision making; and understanding the limitations of technology. Students will read books and articles from
both technical and non-technical perspectives, explore specific issues independently and in groups, write formal and informal papers, and complete a group project. This seminar should help students understand how the social context of technology relates to their individual majors and interests, whether technical or non-technical.

**ECE 2813 HP**  
**Technology and Learning: Past, Present and Future**  
David Schimmel  
W 3-6

From the monolith in Arthur C. Clarke’s 2001: A Space Odyssey to the use of clickers in lecture, from the invention of the printing press to the innovative use of video games in K-12 education, technology has had and continues to have a profound impact on how we think about and go about teaching and learning—both in formal settings and through our entire lives. Technologies such as simulators, visualization tools, online learning, search engines, collaboration tools, smart boards, calculators, smart phones, and podcasts, to name but a few, all have the potential to disrupt teaching and learning in a myriad of ways. This course will explore intentional and unintentional impacts of technology on learning. We’ll read widely: from the educational technology literature, from the popular press on innovations in education, and from relevant science fiction and futurist writings. We will also bring our own experience, creativity, and critical thinking to bear. We will discuss and debate the merits of existing approaches, and propose and defend our novel ideas.

**HTS 3803 HP**  
**Spytech: Devices and Methods in the Service of Espionage**  
Kristie Macrakis  
TR 1:30-3

This course will follow the historical development, culture, and socio-political constructs of some of the most important technological devices, techniques, and methods used in conducting espionage. Topics include planes, satellites, submarines, the CIA’s LSD experiments, agent technology, and the post-9/11 assessment of American spy technology.

**LCC 3234 HP**  
**Notions of Creativity: Creative Writing as Engineering**  
Karen Head  
TR 1:30-3

This course will focus for half the term on poetry, with the other half-term focusing on fiction. Students will create an online “journal” for their final project to emphasize issues relating to editing and publication. The overall aim is to connect notions of creativity with the work students do in their major fields, as well as to offer a more general outlet for creative endeavors.

**PHYS 4803 HP**  
**The Atomic Age**  
Monica Halka  
TR 1:30-3

This course will explore the science, culture, and psychology associated with the most dangerous weapon ever invented, as well as the spin-off into nuclear power. Readings will include professional scientific journals, popular science articles, and the novel “Los Alamos.” Films, plays, and White House recordings will be presented and discussed. Students will learn how to build a thermonuclear device. Guest speakers will be invited to explain current issues in nonproliferation. Students will actually learn to pronounce “thermonuclear” and “nonproliferation.” There will be physics.
Fall 2010 GT Honors Program Special Topic Courses

CHEM 2803 HP  Science of Alternative Energy  Thomas Orlando  MWF 11-12
This course will give a general overview of the most popular alternative energy sources which are currently being used or developed to help relieve the world dependence on fossil fuels. The basic scientific principles governing the current and future approaches in solar photovoltaics, fuel cells, biomass conversion, nuclear energy and wind power will be presented. Though the course will focus on the basic principles and fundamental science underpinning the current advancements in energy technologies, there will also be an emphasis on understanding the efficiency and general sustainability issues associated with the most popular alternate energy options. Due to the interdisciplinary nature of the topic, the course will involve multiple instructors from across the College of Sciences.

CS 4001 HP  Big Ideas about Living and How Computing is Affecting Them  Colin Potts  T R 1:30-3
This course introduces students to ethical and professional issues associated with the introduction and deployment of computing and information technology. We will concentrate on several fundamental philosophical questions that are raised by new technology, such as the following: What is moral agency? When we say that an agent decides to perform an action and is responsible for it, what does that mean, and could this ever be said about a robot or a command and control system? If not, why not? What is property, and why are owners entitled to it? When we say that downloading media files without copyright owners’ permission is “theft”, what does this mean and what should the sanctions be? Do we have privileged rights over knowledge about ourselves? What are the appropriate trade-offs between the interests of public safety and privacy?

GRMN 4813 HP  The Burden of the Past  Frank Pilipp  T R 12-1:30
In this course, The Burden of the Past: Memory, Accountability, and Soul-Searching in German and American Film, students will examine recent films (of the past two decades) from Germany as well as some from the U.S. about historical events that have had an impact that contemporary society continues to try to come to terms with. The Holocaust, slavery, the expropriation of native Americans, the deprivation of civil and women’s rights have not only been of utmost historical significance but also long-standing topics in film and literature that still cause public debates and controversies today.

HTS 2803 HP  Semester in the City  Greg Nobles and Andrea Ashmore  T R 1:30-3
This mind-on/hands-on service-learning course invites students to explore how an urban neighborhood works – and equally important, to begin working in that neighborhood. We will focus on the English Avenue community, just adjacent to the west side of Georgia Tech, a neighborhood facing serious challenges but also developing significant strategies for change. Looking at English Avenue from a variety of perspectives – historical, social, political, economic, and environmental, among others – we will seek to understand the community on its own terms, but also study it within the larger context of the city of Atlanta.

HTS 3803 HP  Revolution & Reform in East Asia  Hanchao Lu  T R 1:30-3
The course will examine the major revolutions and reforms since the 19th century that have brought China, Japan, and Korea to their respective status in the world today. The extraordinary revolutions and reforms in these countries, including some ongoing events such as the transformation of China from communism to capitalism, not only affected the lives of millions of people in the area but also had profound impact on the geopolitical map of the world. This special topic course will help intellectually active students prepare for the increasingly diversified world that they are bound to enter.
MTH 4803 HP  The Study of Efficiency in Nature  John McCuan & Maria Westdickenberg  T R 12-1:30
This course explores the history, elementary mathematical principles, and philosophical considerations associated with variational methods and thinking. The calculus of variations can be used to explain many physical problems in which the function to be optimized is immediately evident: soap films minimize the area of certain surfaces; the distance one can travel on a tank of gas can be maximized by choosing the correct regime of acceleration and deceleration. There are other problems which are less obvious but for which, surprisingly, the theory also provides an explanation: Why does a reflected beam of light leave a mirror at the same angle as the incoming beam? Why is Newton’s Second Law of Motion true? In each case, an explanation can be given on the basis that some "variational function" is being optimized. This kind of thinking has provided an aesthetic principle which has profoundly molded our notion of beauty and truth in science.

PST 3127 HP  Biotechnology Law, Policy, and Ethics  Roberta Berry  T R 1:30-3
This course examines challenging issues in biotechnology law, policy & ethics through multi-disciplinary course readings. The course employs an active-learning, seminar-style approach, with panels of students assigned to write and present short papers addressing the class readings. Class discussion centers on the papers presented each class. Issues addressed may include neuroimaging technologies, brain-machine interface technologies, nanotechnologies, human cloning, human genetic engineering, patenting of genes/life, genetically modified foods, DNA identification for forensic and other purposes, synthetic biology and the creation of cellular machines. All course readings will be posted on electronic reserves or available on the Web; there will be no assigned text.

PSY 2803 HP  Psychology of Creativity and the Arts  Paul Verhaeghen  T R 9:30-11
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Fall 2009 GT Honors Program Special Topic Courses

BIO 4740 HP  Biologically Inspired Design  Jeanette Yen  TR 1:30-3
In this course, we teach biologically-inspired design as an innovative tool utilizing design strategies observed in natural systems as stimuli for novel inventions, to increase biological understanding through the use of quantitative analyses, and to provide a model for practicing interdisciplinary exchange between biology and engineering. We examine evolutionary adaptation as a source for engineering design inspiration, utilizing principles of scaling, adaptability, and robust multifunctionality that characterize biological systems. Students will learn about a variety of biomimetic methods and ongoing research projects.
COE 3002 HP  Intro to Microelectronics & the Nanotechnology Revolution  John Cressler  TR 4:30-6
This course will expose UG students with little or no ECE background to a high-level understanding of the microelectronics and nanotechnology revolution and its global impact on both technology and society. Engineering, management, and science students will comprise the class, and by its nature it will be highly interdisciplinary in its appeal.

CHEM 4803 HP  The Art of Talking Science  Paul Houston  TR 3-4:30
This course will examine exciting scientific research programs ongoing in the College of Sciences through interviews, lab visits, and presentations. Students will delve into modern scientific research, develop their skills in interviewing, and develop writing and presentation skills, all within a scientific format. Students will explore communication methods that make complex scientific topics accessible to the general public. The end goal is to have an article for publication, for example, in the Technique or SciTech, or an article, podcast or video for inclusion on the College of Sciences web page.

PHY 2803 HP  Optical Illusions: A Study of Light and Perception  Monica Halka  TR 1:30-3
The world we think we see is not the world that exists. For example, the human eye perceives only a tiny range of wavelengths in the electromagnetic spectrum. Color is not the same to everyone. And our brains interpret what we see in strange ways. This interdisciplinary course will blend current events, guest speakers, lively discussion, and a diverse array of literature and demonstrations to elucidate the curious nature of light and our interaction with it.

HTS 2803 HP  Semester in the City: Engaging English Ave.  Greg Nobles and Andrea Ashmore  TR 1:30-3
This mind-on/hands-on service-learning course invites students to explore how an urban neighborhood works – and equally important, to begin working in that neighborhood. We will focus on the English Avenue community, just adjacent to the west side of Georgia Tech, a neighborhood facing serious challenges but also developing significant strategies for change. Looking at English Avenue from a variety of perspectives – historical, social, political, economic, and environmental, among others – we will seek to understand the community on its own terms, but also study it within the larger context of the city of Atlanta.

LCC 3823 HP  Thoreau’s House  Hugh Crawford  TR 9:30-11
In this course we will build a full-scale version of Thoreau’s hut (using the materials, tools and practices he could or would have used) to develop a critical, technical, and historical understanding of the task Thoreau set himself—to build by hand his own home. We will also explore 19th century discourse surrounding country architecture, gardening, etc. in relation to the construction of a “rural retreat”; the use of the tools necessary for such a practice; the relationship between tools, hands, and mind as articulated by Thoreau; a range of historical texts on handicraft; the work on hands and knowledge production currently being carried out by scholars working in cognitive science and related fields; and the role Thoreau plays in current articulations of sustainable living and minor architecture.
INTA 4803 HP Latin American Identity and Politics  
Kirk Bowman  
TR 8-9:30

Who are you? What is your primary identity? Why? This seminar analyzes the formation of identity in Latin America. We will start with the major theories of identity formation in Europe based on the myths of ancestral home, on the power of imagined communities through language and communication, and the power of war to shape identity. We will identify the multiple domains in Latin America that are not explained very convincingly by those theories and will explore alternative explanations of sports (largely soccer in the Southern Cone), music, and other cultural markers. Much of the course will focus on soccer as the potent force that both creates and divides national identity. Each student will produce a research project that explores the formation and endurance of identity in individual countries and present findings to the class. Dr. Bowman was named 2008 Georgia Professor of the Year by the Carnegie Foundation for the Advancement of Teaching and the Council for Advancement and Support of Education.

Fall 2008 GT Honors Program Special Topic Courses

INTA 4803 HP  
The Sleeping Giant Awakens: Dissecting the Rise of China  
Fei-Ling Wang  
T 3-6 pm

This course is an in-depth investigation of the rise of China, an epic development that represents great opportunities and serious challenges to the world. Is China already a world leader in technology and manufacturing? Can China become a new superpower without being a democracy? Are Chinese objectives and values compatible with that of the Americans”? Will the United States thrive in peace and prosperity with China as the co-pilot or even the new world leader? To answer these and many other questions, we will first examine the basics by utilizing multimedia materials. Based on group research activities, we will have student-led in-class discussions dissecting the various aspects of the rise of China and its implications, ranging from assessing China’s engineering and management capabilities, analyzing Beijing’s strengths and weaknesses, to reviewing Chinese soft power in culture and popular arts.

HTS 4813 HP  
Selective Scholarships Seminar  
Greg Nobles & Paul Hurst  
T Th 3-4:30

This three-credit course is designed to offer a challenging but supportive structure for those students pursuing one or more of the most prominent scholarship opportunities – Rhodes, Marshall, Gates, Truman, Fulbright, Goldwater, and the like. Recognizing that the application process takes a considerable amount of time and preparation, we are creating a context for doing the necessary work in concert with other students and faculty mentors and, equally important, providing the deadlines and discipline that will help everyone get everything done. By the end of the semester, students should have developed not only the written portfolio but also the practical skills that will put them in a good position for the formal application process.

ISYE 4803 HP  
Mathematical Modeling of Election Issues  
Joel Sokol  
MW 3-4:30

In this course, we will discuss three types of election-related mathematical models. First, we will discuss some of the issues in the fall 2008 election using mathematical models rather than rhetoric to point out the important philosophical tradeoffs. Second, we will discuss mathematical models of how voters choose their preferred candidate(s), and consider the implications for candidate selection in general. Third, we will discuss some different types of voting systems and their relative advantages/disadvantages. The amount of time spent on each topic and the depth of coverage will depend on the interests and background of the students who take the course.
Jefferson's famous phrase in the Declaration of Independence -- "life, liberty, and the pursuit of happiness" -- has become so ubiquitous in American culture that few people pause to consider its meaning. The words "the pursuit of happiness" slip off the American tongue with scarcely a thought. And yet the idea of "the pursuit of happiness" warrants serious consideration. For starters, it seems a rather odd thing for Jefferson to have put in a revolutionary document. What did he mean by the "pursuit of happiness," and why did the other founders consider it a perfectly logical follow-up to "life" and "liberty"? Why did they all agree that "Nature and Nature's God" had "endowed" human beings with an "inalienable right" to this "pursuit of happiness"? What was the pursuit of happiness all about? Equally important, how has the concept changed over time? Just last week I saw a T.V. commercial that uses the "pursuit of happiness" line to promote the purchase of a luxury automobile.

LCC 3833 HP  Disability Studies: Literature, Film, and Service Learning  Hugh Crawford  MWF 2 – 3
This course is designed to provide an introduction to the field of Disability Studies through examining theoretical texts, literature and film, and through service learning opportunities. Some of the authors we will read include Flannery O'Connor, William Faulkner, Katherine Dunn, Georges Canguilhem (on The Normal and the Pathological), Michel Foucault, Sander Gilman, and the photography of August Sander. Films will include Shakespeare's Richard III, The Elephant Man, The Children of a Lesser God, and Blindsight. The course will include field trips to work with disabled athletes and to examine adaptive technologies and architectural design. In addition to service opportunities, students in the seminar will take several tests and do a seminar project.

COE 3002 HP  Intro to Microelectronics & the Nanotechnology Revolution  John Cressler  T Th 4:30-6
This course will expose UG students with little or no ECE background to a high-level understanding of the microelectronics and nanotechnology revolution and its global impact on both technology and society. Engineering, management, and science students will comprise the class, and by its nature it will be highly interdisciplinary in its appeal.

MATH 4803 HP  Combinatorial Game Theory  Tom Morley  MWF 9
Combinatorial games are two player games without chance moves (shuffling, dice, etc.). They are often encountered in mathematical puzzles, but they are also of interest in computational complexity and applications. They also provide the foundation for the surreal numbers. In this course we will study combinatorial games, starting with Nim and Hackenbush, and include take away games, chomp, ordinal numbers and infinitesimals. There are many open conjectures, and we will explore these computationally. Corequisite: MATH 1502

ISYE 4803 HP  Duality: An Interdisciplinary Exploration  Craig Tovey  T Th 2 - 3:30
Duality is a phenomenon that arises in fields including algebra, geometry, calculus, economics, biology, industrial engineering, and music. The aim of this seminar is to open your eyes, forever, to the wonders, beauties, and uses of duality. We will explore duality in many of its guises: lines and points in Euclidean geometry, regular polyhedra, the selfish gene in evolutionary biology, counterpoint, Lagrange multipliers, two-person zero-sum games, vacancy chains, Little’s law, matrix multiplication, and others.