Theme Overview

Access to unprecedented amounts of information is creating new opportunities for students and faculty, working together in multidisciplinary teams, to actively engage with the world around them. At the same time, the unparalleled availability of personal information published by smartphones, web browsers and social media is exposing society to new risks. We will combine coursework, co-curricular experiences and integrated project teams to explore the evolution of society and culture through the lens of information, using the latest computational methods to understand society's most pressing problems in new and creative ways.

Student Opportunities

Undergraduate Students

All students are eligible to take the gateway course or FOCUS cluster to learn about the theme. There is also a wide range of courses with INFO content already available (see below). Students also have the opportunity to participate in numerous co-curricular activities (see below). A new ISIS certificate is approved—this requires students to take the gateway course, a capstone course, two relevant courses, and two “learning experiences” (e.g., working on a project team, participating in a workshop).

Graduate & Professional Students

A parallel graduate-level INFO/ISIS certificate is planned. At present, graduate students and professional students may participate by: (1) taking courses with INFO content (see below); (2) joining a project team; (3) serving as a TA for the gateway course; (4) serving as an RA to help organize INFO events (see below); and, (5) engaging in INFO co-curricular experiences (see below).

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Fall 2015 Gateway Courses

(details below)

- Information, Society & Culture (110: Cross-listed in COMPSCI, ISIS, PHIL, and PUBPOL)
- Introduction to Mathematical Modeling in Biology, Math 161FS (FOCUS cluster: What if?)

2015-2016 Courses

- AAHVS/ECE 590S/VMS 590S: 3D Design/Programming in Art & Medicine
- Spring: MATH 477S: Mathematical Modeling
- DANCE 308 / ECE 496 / ISIS 376 / THEATRST 364: Performance and Technology
- PHIL/ISIS 310: Information and Philosophy: Personal Identity, Knowledge and Ethics
- ISIS 240: Web Multimedia Communications
- COMP SCI 260: Intro to Computational Genomics

Fall 2015 Project Teams

(details below)

- A Course Performance Mapping App
- NC Jukebox
- Innovation & Technology Policy Lab
- Machine Society Interfaces
- Intl Genetically Engineered Machine (iGEM)
- Feature Extraction and Quantitative Analysis of Large Scientific Document Corpra
- Public Access to Government Information
- The Lives of Things
- Digital Archaeological and Historic Landscapes: Lab & Fieldwork

http://bassconnections.duke.edu
Details

Gateway Courses

**ISIS 110D/PHL 110D/COMPSCI 110D/PUBPOL 110D: "Information, Society & Culture" (FALL ONLY)**

This course takes the students on a journey through the world of information. It shows how questions such as "What is a digital song?", "Can we own information?", "What is privacy?", "Do we have friends on Facebook?", "How does the internet work?", "Is the mind a computer?" and "How has the informational revolution changed society?" are deeply connected. By taking a holistic and multi-faceted approach to these and other questions, the course creates a mature preparation for participation in the ISIS certificate program. It also gives the students opportunity to enter the various research teams of the Information, Society and Culture theme of Bass Connections. Students will be introduced to the various projects by meeting the participants and by understanding the relevance of the team's research projects. As a result, the students will be able to better structure their Duke experience and come out more competent and socially engaged citizens of the global information society. The hallmark of the information society is enhanced collaboration and creativity. To foster this, the course is structured around small group projects based on student-initiated socially relevant topics related to the class discussion. Students create a portfolio that combines exploration in information science, philosophy, public policy, and computer science, but may also involve art, video production, history or social science.

**Math 161FS: “Introduction to Mathematical Modeling in Biology” (FOCUS cluster)**

This course introduces techniques used in the construction, analysis, and evaluation of mathematical models. How do we frame a scientific question in mathematical terms? How do we formulate a mathematical description or representation of the system in question? How do we study the model using mathematical tools and techniques? How do we interpret the results and put them back into a scientific context? Modeling topics will primarily be in biology. Instructor: Anita Layton

**Bass Connections in Information, Society & Culture Certificate Option Is Here!**

Students can pursue an Information Science + Information Studies Certificate and use their Bass Connections project participation toward Certificate Credit. For more info see: http://isis.duke.edu/undergraduate/certificate

Courses-check listings for availability

**ISIS 240: “Web Multimedia Communications”**

Multimedia information systems, including presentation media, hypermedia, graphics, animation, sound, video, and integrated authoring techniques; underlying technologies that make them possible. Practice in the design innovation, programming, and assessment of web-based digital multimedia information systems.

**HISTORY 390S-1/ISIS 390S/MUSIC 290S: “NC Jukebox”**

Students will transform this inaccessible audio archive of historic North Carolina folk and popular music into a vital, publicly-accessible digital archive and museum exhibition. Course participants will build a proof-of-concept NC Jukebox from the Frank C. Brown collection of 400 digitized audio tracks in the Rubenstein Library. They will also use Brown's handwritten field notes and his manuscript letters to research the history of music making in early twentieth-century North Carolina. Additionally, students will use vintage audio recordings and field notes to create a digital NC Jukebox, and accompanying print or multimedia material, for use by a mountain music museum in Spruce Pine, North Carolina.
COMP SCI 260: “Intro to Computational Genomics”
A computational perspective on the analysis of genomic and genome-scale information. Focus on exploration and analysis of large genomic sequences, but also attention to issues in structural and functional genomics. Topics include genome sequence assembly, local and global alignment, gene and motif finding, protein threading and folding, and the clustering and classification of genes and tissues using gene expression data. Students to learn computational approaches to genomics as well as to develop practical experience with handling, analyzing, and visualizing information at a genome-scale.

AAHVS/ECE 590S/VMS 590S: “3D Design/Programming in Art & Medicine”
Students will design proof-of-concept gesture-based interfaces for interacting with 3D digital representations, with special focus on prototypes for augmented reality display of art & sculpture and on tools for home diagnosis of Parkinson’s disease. Team-project-based learning pairs computer scientists, engineers, medical students, multimedia artists, and art historians. Technologies include: Kinect/PrimeSense, Leap Motion, and webcam motion tracking. Basic programming experience required for computer science students. Application domain knowledge required for arts and medicine students. Consent of instructor required. Opportunity to continue development in future, including participation in a 2015 Nasher exhibition and/or interaction with neuroscientists to further refine the Parkinson’s system. Instructors: Mark Olson, Mariano Tepper, Carolina A. Bruzelius, Guillermo Sapiro

MATH 477S: “Mathematical Modeling”
In this course, students will learn how to formulate mathematical models that can be used to answer scientific questions. They will also learn a variety of techniques for studying the models, including mathematical analysis, computations, and simulations. The ability to identify essential features of a system that must be represented in a model, and then to properly interpret model outputs in the appropriate scientific context, is a valuable skill that will be useful in many fields. Instructor: Anita Layton

DANCE 308 / ECE 496 / ISIS 376 / THEATRST 364: “Performance and Technology”
This workshop will explore technologies embedded in performance: robots, media, computer interface. Students create performance projects and discuss theoretical and historical implications of technologies in performance. Open to dancers, actors, musicians, spoken word artists and all those interested in technology and the arts. No previous experience or programming skills required. Instructors: Thomas DeFrantz, Martin Brooke and Tyler Walters

Project Teams Forming Now for Fall 2015

(1) The Digital Landscape: New Technologies to Visualize Ancient Landscapes (FALL)
Led by Maurizio Forte (AAHVS) and Regis Kopper (DiVE)
Description: What was the lagoon’s appearance when ancient Venetians were looking from their windows? What plants were growing close to Etruscan tombs? What would a Neolithic inhabitant of Catalhoyuk in Turkey see in their environment? Virtual reality allows us to see with our ancestors’ eyes, “diving” into ancient landscapes using sophisticated 3D visualizing systems such as DiVE, Oculus Rift and zSpace. Students will use virtual reality tools to learn how to implement data found in archives and historical maps to build a mosaic of information, recreating our ancestors’ world. Once the geographic information database is complete, students will learn how to create the objects that will compose the final virtual landscape.

(2) Innovation & Technology Policy Lab (2015-2016 ACADEMIC YEAR)
Led by Jason Cross (Law, Sanford, Global Health), Gary Gereffi (SOC), Phyllis Pomerantz (Sanford), Arti Rai (Law), Jerome Reichman (Law), and Kip Frey (Law, Sanford, Fuqua)
Description: Intellectual Property (IP) rules governing innovations for development greatly affect the impact in developing countries. Insufficient IP without alternative financing limits the investment needed to bring certain innovations to scale. Too stringent IP limits access via high prices and blocks follow-on innovators. These IP issues further impact how far capacity building linked to these innovations can go. Meanwhile, novel IP strategies in various sectors are harnessing the potential of more open innovation models that expand collaboration and bring down costs. The Policy Lab will conduct empirical case studies of the
business models, IP strategies and regulatory context of innovators for development in both developed and developing countries. These case studies will combine the entrepreneur’s perspective and the view from various policy stakeholders (government officials, users, competitors). They will inform comparative analysis from which the Policy Lab will present IP policy options to development agencies.

(3) **Machine Society Interfaces**  
Led by Martin Brooke (Pratt ECE), Thomas DeFrantz (Dance)  
**Description**: Governments and Performers share a desire to trace the path an individual takes through groups and society. Government motivations cover a spectrum from the beneficial, through benign, and belligerent. An Institution able to locate a lost Alzheimer’s patient is also able to follow dissidents and detractors. Performers being tracked by the stage environment can influence the overall performance (music, lights, video, objects) in ways currently impossible, enabling interactive and evolutionary performances, with the added benefit of a real-time digital archive.

Led by Kenneth Rogerson (Sanford)  
**Description**: Advances in Information and Communication Technologies (ICT) have the potential to change the relationship between the government and citizens in a democracy through expanded access to government-provided information. Through technology, governments can facilitate access to its operations and records, thereby potentially encouraging increased public scrutiny and analysis. This could include transparency of the legislative process, accountability of public finances and spending, deeper assessment of public benefits, and better aggregation and distribution of government materials. If citizens better understood how governments operate on their behalf, they might exert more effective control, increasing public goods, decreasing corruption, and diminishing the influence of powerful special interest groups.

**Campus Partners for Co-sponsorship of Future Endeavors**

1. Wired!  
2. Information Initiative @ Duke  
3. Visual Studies Initiative  
4. HASTAC  
5. Duke Art, Law & Markets Initiative (DALMI)  
6. Digital Scholarship (Duke Libraries)  
7. PhD Lab in Digital Knowledge (Franklin Hum. Institute)  
8. Duke STEAM challenge

**Co-curricular Experiences**

**Workshops** ([http://library.duke.edu/data/news](http://library.duke.edu/data/news))

*Scholarly Communications*: New models for publishing and scholarly discourse: technologies, policies, and economics (w/Duke Libraries)

*GIS/Data*: How to gather, manipulate, analyze, and visualize data (w/Duke Libraries)

**Experiential Learning** ([www.fhi.duke.edu/labs/phd](http://www.fhi.duke.edu/labs/phd))

*Publishing Focus*: Visits to Independent newspaper, Duke Univ. Press, Durham-based letter-press office, etc. (w/PhD Lab)

*Production Focus*: Build website to analyze and exhibit the past and future of publishing (w/PhD Lab)

*Summer Internships*: Web page/social media development for a nonprofit (w/Sanford School).

**Modules on Demand**

*Digital Scholarship*: Tools & methods of new technological approaches to interdisciplinary research (e.g., text-mining) (w/Duke Libraries)