The Free and Open Source Software and Free Culture Minor (FOSS-MN)

RIT's School of Interactive Games & Media's undergraduate Minor in Game Design consists of five courses with variable credit. This minor draws from the College of Computing and Information Sciences and the College of Liberal Arts. The minor is intended to give students greater direct experience in the creation of FOSS technology and FC projects while providing a deeper understanding of the theoretical and practical underpinnings of the process and its social, commercial and legal roots and impacts. This minor will provide students the ability to engage in the ongoing critical discourse within those communities and across the larger canvas of "creative" in society, combining academic knowledge with practical experience. It is expected that all pre-requisites be completed before a student is enrolled in the minor (see reverse).

Three (3) required courses:

IGME 582 Humanitarian Free and Open Source Software Development
(quarter equivalent 4080-445 Humanitarian Free and Open Source Software Development)
This course provides students with exposure to the design, creation and production of Open Source Software projects. Students will be introduced to the historic intersections of technology and intellectual property rights and will become familiar with Open Source development processes, tools and practices. They will become contributing members of humanitarian software development communities such as the One Laptop Per Child and Sugar communities. Students will actively document their efforts on Humanitarian Free and Open Source Software community hubs. **(Third Year Standing)**

IGME 583 Legal and Business Aspects of Free and Open Source Software Development
The entertainment and software industries are grappling with the impacts of "free software" digital distribution. Agile development, 3D printing, the Internet and other technologies are changing the face of how business is done, as well as what business can charge for and hold onto. Disruptive technologies, emerging interfaces, and real-time, on-demand product creation and distribution are transforming our entertainment, telecommunications and manufacturing landscapes. This course will examine the impacts of these new technologies and the new thinking that are taking us into these new worlds. **(IGME 582)**

ENGL 450 Free and Open Source Culture
This course charts the development of the Free Culture movement by examining the changing relationship between authorship and cultural production based on a variety of factors: law, culture, commerce and technology. In particular, we will examine the rise of the concept of the individual author during the last three centuries. Using a variety of historical and theoretical readings, we will note how law and commerce have come to shape the prevailing cultural norms surrounding authorship, while also examining lesser known models of collaborative and distributed authoring practices. This background will inform our study of the rapid social transformations wrought by media technologies in last two centuries, culminating with the challenges and opportunities brought forth by digital media, mobile communications and networked computing. Students will learn about the role of software in highlighting changing authorship practices, facilitating new business and economic models and providing a foundation for conceiving of open source, open access, participatory, peer-to-peer and "Free (as in speech, not beer)" cultures.

Choose one (1) of the following:

ENGL 361 Technical Writing *(quarter "equivalent": 0502-444 Technical Writing)*
Provides knowledge of and practice in technical writing. Key topics include audience analysis; organizing, preparing and revising short and long technical documents; designing documents using effective design features and principles, and formatting elements using tables and graphs; conducting research; writing technical definitions, and physical and process descriptions; writing instructions; and individual and group peer editing.

IGME 584 Software Development to Linux Systems
Students will learn how to package software for release and engage in version maintenance within the FOSS community. Topics such as Linux package management, version control systems, potential license conflicts, development vs. production releases, bug tracking, maintenance management, forking, patching and future development will be covered in from both a

management and end-user perspective in lectures, lab exercises and a project. **(IGME 582 and a one-year programming sequence in any language such as IGME-101/102)**

Choose one (1) elective:

IGME 584 Software Development to Linux Systems*
Students will learn how to package software for release and engage in version maintenance within the FOSS community. Topics such as Linux package management, version control systems, potential license conflicts, development vs. production releases, bug tracking, maintenance management, forking, patching and future development will be covered in from both a management and end-user perspective in lectures, lab exercises and a project. **(IGME 582 and a one-year programming sequence in any language such as IGME-101/102)**

IGME 585 Project in Free and Open Source Software Development
(quarter "equivalent": 4080-590 Seminar: Project in FOSS Development)
Free and Open Source Software development is an internationally growing methodology for distributing work across multiple developers. The process can be applied to small "garage-sized" teams (small utility packages, multimedia plugins, simple games) or teams of hundreds (Mozilla, Java, Linux). This course builds on the introductory experience provided in the prerequisite to provide hands-on open-source development experience in a large-scale, project that will be prepared for open-source distribution. The actual projects and domains addressed will vary offering to offering, but will be along the lines of those listed above. **(IGME-582 and third-year standing)**

CSEC 474 Unix-based System Forensics *(quarter "equivalent": 4050-581 Computer System Forensics)*
This course is designed to provide students with the ability to identify and employ forensics techniques for gathering, preserving and analyzing evidence on Unix-based systems, and to report the pertinent evidence to the courts. The course emphasizes both the fundamental computer forensics procedures and the hands-on experience of utilizing forensics tools to uncover pertinent evidence from memory, allocated and unallocated space, and other Unix artifacts including log files, deleted files, browser history, emails, etc. Students will also follow and practice the forensically-sound procedures to ensure evidence admissibility in court. **(NSSA- 221 Systems Administration I or Equivalent)**

CSCI 715 Applications in Virtual Reality** *(quarter "equivalent": 4005-765 Applications in Virtual Reality)*
This course will investigate the application of virtual reality software and technology within a given domain. Working in sets of technical teams, students will collectively investigate and solve a large-scale visualization task within that problem domain. Focus of individual student teams may include (but is not limited to) distributed VR framework, viewing applications, interaction with VR devices / displays, and audio in virtual environments. Students will be required to read and summarize selected articles from VR literature, as well as papers specific to the problem domain being investigated, to assist in making design decisions. A report or survey of one aspect of using a virtual reality system within the given domain is also required. Students should have a strong programming background and a proficiency in a 3D API (OpenGL, DirectX, or Java3D). Students with expertise in distributed systems and an interest in Graphics or virtual reality are also encouraged to register. (CSCI-510 Introduction to Computer Graphics or CSCI-610 Foundations of Computer Graphics or permission of instructor) 3 (Spring)

ISTE 252 Foundations of Mobile Design *(quarter "equivalent": 4002-590 Seminar in Foundations of Mobile Design)*
This course is an introduction to designing, prototyping, and creating applications and Web Apps for mobile devices. These devices include a unique set of hardware and communications capabilities, incorporate novel interfaces, are location aware, and provide persistent connectivity. Topics covered include user interaction patterns, connectivity, interface design, software design patterns, and application architectures. Programming projects are required. (**ISTE-240 Web II).**

ENGL 215 Text and Code *(quarter "equivalent": 0504-447 Special Topics: Text and Code)*
We encounter digital texts and codes every time we use a smart phone, turn on an app, read an e-book, or interact online. This course examines the innovative combinations of text & code that underpin emerging textual practices such as electronic literatures, digital games, mobile communication, geospatial mapping, interactive and locative media, augmented reality, and interactive museum design. Drawing on key concepts of text & code in fields such as literature, linguistics, creative writing, geospatial mapping, interactive and locative media, and computer science, students will analyze shifting expressive textual practices and develop the literacies necessary to "read" and understand them. Practicing and reflecting on such new media literacies, the course explores their social, cultural, creative, technological, and legal significance. To encourage multiple

perspectives on these pivotal concepts of text & code and their import, the course includes guest lectures by scholars and practitioners in these fields.

ENGL 351 Language Technology *(quarter "equivalent": 0502-351 Language and Technology)*
We will explore the relationship between language and technology from the invention of writing systems to current natural language and speech technologies. Topics include script decipherment, machine translation, automatic speech recognition and generation, dialog systems, computational natural language understanding and inference, as well as language technologies that support users with language disabilities. We will also trace how science and technology are shaping language, discuss relevant artificial intelligence concepts, and examine the ethical implications of advances in language processing by computers. Students will have the opportunity to experience text analysis with relevant tools. This is an interdisciplinary course and technical background is not required.

ENGL 361 Technical Writing* *(quarter "equivalent": 0502-444 Technical Writing)*
Provides knowledge of and practice in technical writing. Key topics include audience analysis; organizing, preparing and revising short and long technical documents; designing documents using effective design features and principles, and formatting elements using tables and graphs; conducting research; writing technical definitions, and physical and process descriptions; writing instructions; and individual and group peer editing.

ENGL 581 Introduction to Natural Language Processing
This course provides theoretical foundation as well as hands-on (lab-style) practice in computational approaches for processing natural language text. The course will have relevance to various disciplines in the humanities, sciences, computational, and technical fields. We will discuss problems that involve different components of the language system (such as meaning in context and linguistic structures). Students will additionally collaborate in teams on modeling and implementing natural language processing and digital text solutions. We will program in Python and use the Natural Language Toolkit and related tools (such as Weka). (**Required previous coursework: Language Technology or a programming class (or a similar course with instructor's consent). Also required: First Year Writing Intensive course or another writing course. ENGL 351 Language Technology or computer programming experience is required for this course.)**

***Students may elect to take both of the constrained elective courses to complete the minor instead of selecting one constrained course and one elective course.**

****CSCI 715 is a graduate-level course offered by the Department of Computer Science (CS). This course is restricted to matriculated graduate students first, CS undergraduate students second, and non-major students on a space available basis third. If you are interested in requesting enrollment in this course, please e-mail Liane Fitzgerald, the Computer Science Manager of Student Services, at liane@cs.rit.edu and ask her to add you to the waitlist. You will not be able to put yourself on the waitlist. After enrollment begins, Liane will assess the enrollment for this course and will place students in it if space is available.***

Prerequisites for the FOSS Minor

Students are required to complete two (2) basic pre-requisites in order to pursue the Minor in Free and Open Source Software and Free Culture:

(1) Successful completion of a recognized sequence in introductory computing (such as the first year Computer Science or Game Design and Development programming courses) or content creation (such as Graphic Design, Animation, or Communication).

(2) Successful completion of the introductory Liberal Arts writing and composition core

Additional requirements and considerations:

- A 3.0 cumulative GPA is expected and required to be enrolled in the minor.
- Students may not enroll in courses for the FOSS minor until their second year of study.
- ***Sample*** path for a GCCIS student: The three required courses, a constrained elective choice of Linux Software Development, and an approved elective choice of Foundations of Mobile Design. This can be completed in a minimum of three semesters.

- ***Sample*** path for a non-GCCIS student: The three required courses, a constrained elective choice of Technical Writing, and an approved elective choice of Text and Code. This can be completed in a minimum of three semesters.

Questions?

If you have any questions about the Minor in Free and Open Source Software and Free Culture, please contact the minor advisor, Jeff Spain at jhsics@rit.edu