1 What courses should I take?

**Students who entered Fall 2015**: by now, you should have finished your “first year hold appointment” in which you worked out a plan for the Spring semester. If you have not scheduled this meeting, please set up an appointment with your advisor by stopping in the IGM Office (Golisano 2145) or by calling 585-475-2763.

**Students who entered RIT before Fall 2015**: you need to follow your program worksheet and/or the Individualized Advising Plan (IAP) that was drafted for you three years ago by your academic advisor. This IAP was drafted specifically for each student who enrolled in classes during the quarter and semester calendars and was discussed with you during an appointment with your advisor. Note: your IAP is “one, suggested path to degree completion.” You should be aware that if you have deviated from the path outlined by your academic advisor, it may impact your ability to graduate in the timeframe that was outlined for you.
Students who entered RIT in (or before) Fall 2012:

- If you have an *Arts of Expression* course left to complete, you may enroll in a General Education Elective (any Math, Science, or Liberal Arts course coded as a General Education course).
- If you are required to complete a *foundational elective*, you may enroll in a General Education Elective (any Math, Science, or Liberal Arts course coded as a General Education course) to fulfill this requirement.

Students who entered RIT in Fall 2013:

- First Year Seminar: take a General Education Elective (any Math, Science, or Liberal Arts course coded as a General Education course).

2 IGM Students Taking (or who will take) 105, 106, and 202

The following IGM courses, IGME-106 and IGME-202, have grade pre-requisites which SIS shows. If you earn a D or lower in a course that is a pre-requisite to one of those courses, you must retake the pre-requisite course. Here are the complete grade pre-requisites:

- If you earn a grade of D or lower in IGME-105, you cannot take IGME-106.
- If you earn a grade of D or lower in IGME-106, you cannot take IGME-202.

Please check with your academic advisor if you have any questions.

3 How do I search for courses?

*Searching for all courses:* see [https://sis.rit.edu](https://sis.rit.edu). All courses in semesters are coded with 4 letter subject codes. Courses offered by IGM are listed as IGME courses.


*Arts & Science Perspectives:* To search for these courses please follow these instructions:

1. Log into [https://sis.rit.edu](https://sis.rit.edu).
2. Select Student Info System.
3. Click on Student Center.
4. Click **Search For Classes** button on the right.
5. Change the **Term** menu to the term you wish to look for courses.
6. Use Course Career menu to select Undergraduate.
7. Change course number to Greater than or equal to.
8. Enter the number 1 in the course field.
9. To see all options, uncheck **Show Open Classes**.
10. In the course attribute field, enter **PERS**.
11. Select the perspective you wish to search by clicking on the magnifying glass under course attribute value.
12. Click **Search**. This list displays all scheduled open and closed General Education classes for the perspective you chose.
13. To add a class to your shopping cart, click **Select**.
Tiger Center: A new class search tool developed by RIT students in partnership with ITS is now available. Tiger Center has the same functionality as SIS but may be more intuitive when searching for classes.  https://classsearch.rit.edu/classSearch/home#/search.

4 Co-op and Career Skills Preparation

In spring semester, IGM will once again offer IGME-099: Co-op Preparation, which targets second-year students. This course helps students prepare for co-operative education employment (“co-op”) by developing job search strategies and material. Students will explore current and emerging aspects of IGM fields to help focus their skill development strategies. Students are introduced to RIT’s Office of Cooperative Education and Career Services, and learn about professional and ethical responsibilities for their co-op and subsequent professional experiences. Students will work collaboratively to build résumés and digital portfolios, and to prepare for interview situations.

The course will be offered Wednesdays from 4:00 PM – 4:50 PM in GOL-2400. Second-year IGM students can enroll first, but if space allows, third- and fourth-year IGM students may also enroll.

5 IGME Spring Semester Core Course Descriptions

5.1 Reminders

These courses are offered in spring semester and are required (eventually) of all GD&D majors. They are listed in numerical order. Any prerequisites for a course are listed in parentheses with quarter “equivalents” for those prerequisites [between square brackets]. Note that the quarter prerequisite courses are not necessarily equivalent to the corresponding semester courses—material from the quarter curriculum has been updated and repackaged under semesters. So, the quarter prerequisite courses listed encompass the necessary material for each semester course.

Remember that 4080-XYZ indicates courses under the quarter system, whereas IGME-ABC indicates courses under the semester system.

5.2 Descriptions

IGME-099 Co-op Preparation Workshop (0 credits):
This course helps students prepare for co-operative education employment (“co-op”) by developing job search strategies and material. Students will explore current and emerging aspects of IGM fields to help focus their skill development strategies. Students are introduced to RIT’s Office of Cooperative Education and Career Services, and learn about professional and ethical responsibilities for their co-op and subsequent professional experiences. Students will work collaboratively to build résumés and digital portfolios, and to prepare for interview situations.

The course will be offered Wednesdays from 3:00 PM – 3:50 PM in GOL-2400. Second-year IGM students are the target audience for this course. If you are not a second-year student and wish to enroll in this course, please contact your advisor. This class covers the mandatory co-op orientation normally held for IGM students.

IGME-105 Game Development and Algorithmic Problem Solving I (4 credits): This course, along with IGME-106 are the semester equivalents of 4080-221, 222, and 223 (the GSD programming sequence). If you have completed both 4080-221 and 222, don’t enroll in IGME 105—take IGME 106 instead.
This course introduces students within the domain of game design and development to the fundamentals of computing through problem solving, abstraction, and algorithmic design. Students will learn the basic elements of game software development, including problem decomposition, the design and implementation of game applications, and the testing/debugging of their designs.

**IGME-106 Game Development and Algorithmic Problem Solving II** (4 credits): This course, along with IGME-105 are the semester equivalents of 4080-221, 222, and 223 (the GSD programming sequence). So, if you have completed 4080-223, don’t enroll in IGME-106. If you have completed both 4080-221 and 222 **but not 223**, enroll in IGME-106.

This course furthers the exploration of problem solving, abstraction, and algorithmic design. Students apply the object-oriented paradigm of software development, with emphasis upon fundamental concepts of encapsulation, inheritance, and polymorphism. In addition, object structures and class relationships comprise a key portion of the analytical process including the exploration of problem structure and refactoring. Intermediate concepts in software design including GUIs, threads, events, networking, and advanced APIs are also explored. Students are also introduced to data structures, algorithms, exception handling and design patterns that are relevant to the construction of game systems. (C- or better in IGME-105 Game Development and Algorithmic Problem Solving I [4080-221 & 222])

*A special note about IGME 106 sections taught by Professor Bierre: All these sections will be offered in a blended course format. This has both online and in-person components of lecture and studio. This course has a semester long project where you and your team will create a 2D game using C# and Monogame. This course will include online lectures and assignments, scheduled lab sections with TA’s and tutoring, and scheduled office hours using email and Skype. Ultimately these sections will have the same outcome as a “live course”.*

**IGME-110 Introduction to Interactive Media** (3 credits): This course is the semester “equivalent” of 4080-295, so **if you’ve completed 4080-295, don’t enroll in IGME-110.**

This course provides an overview of media in historical, current and future contexts. Incorporating lectures and discussion with hands on work involving written and interactive media assets, students examine the role of written and visual media from theoretical as well as practical perspectives. The course also provides an introduction to interactive media development techniques, including digital media components and delivery environments. Students will be required to write formal analysis and critique papers along with digital modes of writing including collaborative editing and effective presentation design. (None)

**IGME-119 2D Animation & Asset Production** (3 credits): This course combines material from 4080-346 and 347. If you have completed 4080-346, do not enroll in IGME-119. If you have completed 4080-347 **but not 346**, enroll in IGME 119.

This course provides a theoretical framework covering the principles of animation and its use in game design to affect user experience. Emphasis will be placed upon principles that support character development and animations that show cause and effect. Students will apply these principles to create animations that reflect movement and character appropriate for different uses and environments. (IGME-110 Introduction to Interactive Media [4080-295])

**IGME-202 Interactive Media Development** (3 credits): This course repackages material from 4080-330 and 4080-434 (Interactive Digital Media and Programming for Digital Media). **If you have completed 4080-330, do not enroll in IGME 202.**

In this course, students will learn to create visually rich interactive experiences. It is a course in programming graphics and media, but it is also a course on the relationship between ideas and code.
Students will explore topics in math and physics by building programs that simulate and visualize processes in the natural world. Assignments will include major programming projects, such as building a virtual world inhabited by digital creatures that display observable behaviors. (C- or better in IGME-201 New Media Interactive Design and Algorithmic Problem Solving III [4080-333] or IGME-106 Game Development and Algorithmic Problem Solving II [4080-223]) & MATH-185 Math of Graphical Simulation I)

**IGME-209 Data Structures & Algorithms for Games & Simulations I** (3 credits): This course is the semester “equivalent” of 4080-387 Data Structures and Algorithms I. If you have completed 4080-387, do not enroll in IGME-209.

This course focuses upon the application of data structures, algorithms, and fundamental Newtonian physics to the development of video game applications, entertainment software titles, and simulations. Topics covered include 3D coordinate systems and the implementation of affine transformations, geometric primitives, and efficient data structures and algorithms for real-time collision detection. Furthermore, Newtonian mechanics principles will be examined in the context of developing game and entertainment software where they will be applied to compute the position, velocity and acceleration of a point-mass subject to forces and the conservation of momentum and energy. Programming assignments are a required part of this course. (IGME-202 Interactive Media Development [4080-330], PHYS-111 College Physics I [1017-211], and MATH-185 Mathematics of Graphical Simulation I [1016-206])

**IGME-219 3D Animation & Asset Production** (3 credits): This course is the semester “equivalent” of 4080-347 3D Animation. If you have completed 4080-347, you do not enroll in IGME-219. If you have completed 4080-346 but not 347, enroll in IGME-219.

This course provides an overview of 3D game asset production. Basic ideas learned within the first asset production course are also revisited within the 3D environs. Topics covered include modeling, texturing, skinning and animation. Emphasis is put on low polygon modeling techniques, best practices in game art production, and effective communication strategies between artists, programmers and designers. (IGME-119 2D Animation & Asset Production [4080-346])

**IGME-220 Game Design & Development I** (3 credits): This course is the semester “equivalent” of 4080-380 Game Design and Development Fundamentals I. If you have completed 4080-380, do not enroll in IGME-220.

This course examines the core process of game design, from ideation and structured brainstorming in an entertainment technology context through the examination of industry standard processes and techniques for documenting and managing the design process. This course specifically examines techniques for assessing and quantifying the validity of a given design, for managing innovation and creativity in a game development-specific context, and for world and character design. Specific emphasis is placed on both the examination and deconstruction of historical successes and failures, along with presentation of ethical and cultural issues related to the design and development of interactive software and the role of individuals in a team-oriented design methodology. Students in this class are expected to actively participate and engage in the culture of design and critique as it relates to the field. (IGME-202 Interactive Media Development [4080-330])

**IGME-230 Website Design & Implementation** (3 credits): This course is the semester “equivalent” of 4080-309 (Introduction to Web Development), but it will include server-side programming, which is “new” material. If you have completed 4080-309, do not enroll in IGME-230.

This course provides an introduction to web development tools and technologies, such as X/HTML, CSS, JavaScript and DHTML, AJAX, web platforms and environments, and server-side programming methods.
IGME-236 Interaction, Immersion, & the Media Interface (3 credits): This is a new course that replaces 4002-425 Human Computer Interaction I, which was offered by the Department of Information Sciences and Technology. It also replaces 4080-323 Design of the Graphical User Interface in the New Media program. If you have completed 4002-425 or 4080-323, you should not enroll in IGME 236.

This course examines the concepts of interface and interaction models in a media-specific context, with particular emphasis on the concept of the immersive interface. This course explores concepts such as perception, expectation, Gestalt Theory, interactivity, Semiotics, presence, and immersion in the context of media application development and deployment. In addition, underlying concepts of cognitive psychology and cognitive science will be integrated where appropriate. These theories are then integrated in the exploration of the immersive interface, and with related concepts such as user-level-interface modification, augmentation of identity, and the interface as a social catalyst. (IGME-102 New Media Interactive Design and Algorithmic Problem Solving II [4080-231] or IGME-106 Game Development and Algorithmic Problem Solving II [4080-223], and IGME-110 Introduction to Interactive Media [4080-295])

IGME-309 Data Structures & Algorithms for Games & Simulations II (3 credits): This course is the semester “equivalent” of 4080-487 (Data Structures and Algorithms II). If you have completed 4080-487, do not enroll in IGME-309. If you have completed 4080-387 but not 487, enroll in IGME-309.

This course continues the investigation into the application of data structures, algorithms, and fundamental Newtonian mechanics required for the development of video game applications, simulations, and entertainment software titles. Topics covered include quaternion representation of orientation and displacement, cubic curves and surfaces, classifiers, recursive generation of geometric structures, texture mapping, and the implementation of algorithms within game physics engines for collision detection and collision resolution of rigid bodies, and the numerical integration of the equations of motion. In addition, advanced data structures such as B+ trees and graphs will be investigated from the context of game application and entertainment software development. Programming assignments are a requirement for this course. (IGME-209 Data Structures & Algorithms for Games & Simulations I [4080-387] and MATH-186 Mathematics of Graphical Simulation II [1016-228 or 1016-282])

IGME-320 Game Design & Development II (3 credits): This course is the semester “equivalent” of 4080-381 (Game Design and Development Fundamentals II). If you have completed 4080-380, but not 381, enroll in IGME-320.

This course continues to examine the core theories of game design as they relate to the professional field. Beginning with a formalized pitch process, this course examines the design and development paradigm from storyboarding and pre-visualization through rapid iteration, refinement, and structured prototyping exercises to further examine the validity of a given design. Specific emphasis is placed on iterative prototyping models, and on methodologies for both informal and formal critique. This course also explores production techniques and lifecycle in the professional industry. (IGME-220 Game Design & Development I [4080-380])

IGME-330 Rich Media Web Application Development I (3 credits): This is a new course that presents material from 4080-431 Introduction to Web Technologies and 4080-432 New Media Web Technologies II. If you have completed 4080-432, you should not enroll in IGME-330. If you completed 4002-360 Database and Data Modeling under quarters, IGME-330 could count as an Advanced Elective.
If you are a first year student who entered in Fall 2012 (2121) or later, IGME-330 is required for your degree program unless you enrolled in 4002-360 in quarters.

This course provides students the opportunity to explore the design and development of Media Rich Internet Applications (MRIAs). This course moves beyond client and server side web development, and explores issues of presentation, interactivity, persistence, and extensibility common among such applications. Specifically, items explored include framework characteristics, data management, persistence, data binding, information manipulation, as well as data presentation. (IGME-202 Interactive Media Development [4080-330] and IGME-230 Website Design & Implementation [4080-309])

6 Game Design and Development Advanced Elective Courses

6.1 Policies

These courses are advanced elective options for all GDD majors. Like your core courses, some of these courses are new courses, and others are “semester versions” of previous offerings. Some of the new Advanced Electives are stable, semester versions of courses that were offered as seminars under quarters. So, we have noted situations where you should not take a course if you took a specific seminar under quarters.

IGM EXPECTS that in SEMESTERS at least 50% of your Advanced Electives come from IGM. The courses that are currently on the schedule for the upcoming semester are noted below, but we expect that the list of available courses from IGM will continue to grow.

If you would like to take a non-IGM course and have it count as an Advanced Elective, please note the following:

- At least 50% of your Advanced Electives must come from IGM.
- For a course outside of IGM to be considered an Advanced Elective, it should come from the College of Computing and Information Sciences (GCCIS) and/or the College of Imaging Arts and Sciences (CIAS).
- The course must be a 200-400 level course (CIAS) or a 300-400 level course (GCCIS) and have at least one pre-requisite requirement(s) to take the course
- You will also need permission to take a non-IGM course and have it count as an Advanced Elective. IGM permission is required. You should contact your Academic Advisor if this is an option that you would like to pursue. If the course cannot be counted as an Advanced Elective, it may be possible to have it count as a General Education or Free Elective; again, this is something that your Academic Advisor can assist you with.

Please note that you may not “repeat” a semester version of a course and expect it to count towards your Advanced or Free Electives. Aside from the IGM Production Studio, the only time/reason that you may re-take a course and expect it to “count” is to replace a grade and/or meet the semester course pre-requisites.

Advanced Elective courses are listed in numeric order. Any prerequisites for a course are listed in parentheses.

6.2 Descriptions

IGME-430 Rich Media Web Application Development II (3 credits): this is a new course.
This course provides students the opportunity to continue the exploration of Media Rich Internet Applications (MRIAs). Topics include communications for media ecologies, distributed web application frameworks, advanced interactivity, data transformation, representation, automation, persistence, and large scale systems deployment. In addition, students are exposed to concepts and technologies related to the next generation of MRIA development. (IGME-330 Rich Media Web Application Development I [4080-431 & 432])

**IGME-450**  **Casual Game Development** (3 credits): This is a new course.

This course explores the design and construction of casual game experiences. Topics include modes of casual game play, mechanics for casual games, characteristics of successful games, development processes, and the distribution of casual games. Students will create casual games, and employ technologies to address issues of scalability, presentation, social interconnectivity, and game analytics. (IGME-330 Rich Media Web Application Development I [4080-431 & 432])

**IGME-470**  **Physical Computing & Alternative Interfaces** (3 credits): This is the semester equivalent of 4080-433 Physical Computing. If you have completed 4080-433 Physical Computing, do not take this course.

The rich variety and widespread adoption of gestural touch screens, motion-sensing devices, weight-reactive surfaces, wearable digital devices, and similar interface products demonstrates the demand for well-integrated devices and services that seamlessly couple people and environments. Such products can interface computers with real-world inputs and outputs, and give people new ways of controlling and experiencing their devices and information. This course provides a rapid technical introduction to basic electronics (components, circuits, microcontrollers, etc.) and emphasizes the application of interface design concepts to physically interactive and innovative product development. The course requires solo and team projects that blend electronics, programming, and design. (IGME-202 Interactive Media Development [4080-330])

**IGME-529**  **Foundations of Interactive Narrative** (3 credits): This is the semester “equivalent” of 4080-528 Writing for Interactive Media. If you have completed 4080-528 Writing for Interactive Media, do not take this course.

This course focuses on the major elements of narrative for interactive environments. Students in this course explore the basics of narrative in the context of interactive games and media, with examination of digital storytelling in games and interactive environments of several varieties. Branching narrative, hypertext, multi- and non-linear concepts are also explored with an emphasis on balancing immersive and interactive aspects of digital narrative. (IGME-202 Interactive Media Development [4080-330])

**IGME-540**  **Foundations of Game Graphics Programming** (3 credits): This is the semester repackaging 4080-501 Foundations of 2D Graphics Programming and 4080-502 Foundations of 3D Graphics Programming. If you have completed both 4080-501 and 502, do not enroll in this course. If you have completed 4080-501 but not 502, enroll in this course.

Students will explore the use of an advanced graphics API to access hardware-accelerated graphics in a real-time graphics engine context. The course will involve discussion of scene graphs, optimizations, and integration with the API object structure, as well as input schemes, content pipelines, and 2D and 3D rendering techniques. Students will also explore the advanced use of the API calls in production code to construct environments capable of real-time performance. Students will construct from scratch a fully functional graphics engine, with library construction for game development. (IGME-309 Data Structures & Algorithms for Games & Simulations II [4080-487])
IGME-550 Foundations of Game Engine Design and Development (3 credits): This is a new course.

This course will provide students with theory and practical skills in game engine design topic areas such as understanding the graphics pipeline as it influences engine design, hardware principles and the relationship to game engine construction, mathematical principles involved in game engine design, scene graph construction and maintenance, texture and materials management, collision systems, physics systems, particle systems, and control systems. Furthermore, this course will examine software and toolsets that assist game engine designers in their tasks. Students will be expected to design and implement a game engine in teams as well as properly document their design and development strategy. (IGME-540 Foundations of Game Graphics Programming [4080-502])

IGME-571 Interactive Game Audio (3 credits): This is the semester equivalent of 4080-535 Interactive Game Audio. If you have completed 4080-535, you should not enroll in IGME-571.

This course provides students with exposure to the design, creation and production of audio in interactive applications and computer games. Students will become familiar with the use of sound libraries, recording sounds in the studio and in the field, generating sound with synthesizers, and effects processing. Students will create sound designs for interactive media, integrating music, dialog, ambient sound, sound effects and interface sounds within interactive programs (IGME-202 Interactive Media Development [4080-330]).

IGME-580 IGM Production Studio* (3 credits): This is a new course.

This course will allow students to work as domain specialists on teams completing one or more large projects over the course of the semester. The projects will be relevant to experiences of the Interactive Games and Media programs, but will require expertise in a variety of sub-domains, including web design and development, social computing, computer game development, multi-user media, human-computer interaction and streaming media. Students will learn to apply concepts of project management and scheduling, production roles and responsibilities, and their domain skill sets to multidisciplinary projects. Students will complete design documents, progress reports and final assessments of themselves and their teammates in addition to completing their assigned responsibilities on the main projects. Students can enroll in this course twice and count both courses toward their advanced elective requirements. A student must make a formal request to their IGM Academic Advisor if they desire to take this course more than twice. Please contact your advisor for more information. (Third Year Standing)

*See Section 7 of this guide for more information about Production Studio.

IGME-581 Innovation & Invention (3 credits): this is the semester equivalent of 4080-555 Innovation and Invention. It may count for an IGM Advanced Elective, a General Education elective, or a Free Elective (this is not a change).

In this course, students explore the process and products of innovation and invention. Each term a multi-disciplinary team of students conceives and develops a different "outside the box" project. Readings, projects, scholarly term papers, and pragmatic challenges of collaboration and communication across disciplines provides direct experience of the interplay of technology, human nature, and a human environment in which emerging technologies and new modes of interaction are pervasive and ubiquitous. Artists, natural scientists, social scientists, and technologists are guided through a series of collaborative experiences inventing, designing, implementing and studying emerging technologies. Presentations, projects and individually-written research papers are required. The faculty staff and resources of the Center for Student Innovation are significant assets for this course. (Third-Year Standing and completion of first & second-year core)
IGME-582 Humanitarian Free & Open Source Software Development (3 credits): This is the semester equivalent of 4080-445 Humanitarian Free and Open Source Software Development. It may count for an IGM Advanced Elective, a General Education Elective, or a Free Elective (this is not a change). If you have completed 4080-445, you should not enroll in this course.

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 FOSS (3 credits): This is a new course.

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 [4080-445] or equivalent course)

IGME 589-01 Research Studio with Professor Adrienne Decker (3 credits): This is a new course.

For this research studio, we will focus on the design of and experience for the user of educational interactive media experiences and/or games. The users of these experiences should leave the experience with a deeper understanding of a computing concept (programming/graphics/game design/etc.) Another goal of these experiences would be to help the user disentangle the sometimes contradictory nature of these types of concepts. During the course, we will discuss current theory of learning, particularly learning in a computing education context to aid in the ability to design these projects.

Students enrolled in this research studio will be expected to conceptualize, design, pitch, produce and deploy these media experiences by the end of the semester. Students should expect to work in small teams during the semester and will be expected to show good communication and teamwork skills. Students interested in design, user interface issues, and/or art are particularly sought for this research studio.

Please feel free to send questions to Adrienne.Decker@rit.edu

IGME 589-02 Research Studio with Professor Steve Jacobs (3 credits): This is a new course.

Player Content Created Narrative Games: This course will be looking at multiple technologies (everything from ARG to Wiki) for supporting narrative games where players help create the content. This is an extension of the Steampunk Rochester effort that began last year as a three-year project across a set of classes taught by Profs Hergenrader and Lieberman in COLA and Jacobs in IGM. The goal of the three-year project is to create an on-line, participatory, narrative game around an alternate Rochester in the 1920’s. Last year’s classes provided the initial proof of concept that student created narrative content one semester could lead to a solid base for building a game world in a following semester.

In this year’s class, rather than creating a single, stand-alone game prototype, students will build set of different prototypes with the same content base over multiple technologies. The goal of the research is to
work with existing tools and/or create “mash ups” of existing tools to then build prototype games with the content from the two narrative classes.

**IGME 589-03 Research Studio with Professor Chris Egert** (3 credits): This is a new course.

This research studio explores the design and development processes for Massively Multiplayer Online systems. My goal is to help students develop an appreciation for this particular type of game development while grounding their knowledge in the construction of a small scale MMO that draws upon the concepts that would be required for a large-scale system. The studio will guide students in such topics as design and development processes for data modeling, client-side engine development, communications protocols, bandwidth and error negotiation, information consistency, synchronization, and technology scalability.

**IGME 589-04 Research Studio with Professor Andy Phelps** (3 credits): This is a new course.

This course is centered on an indie-focused, small-scale production of a game for PC, with possible derivatives to other modern platforms (console). Coursework for the semester is entirely focused on the creation and deployment of the game, with an eye towards process, production values, and dissemination. Students in the course are required to assign rights for work created to MAGIC Spell Studios, LLC, which retains the game and rights to distribute and market such utilizing a ‘free to play’ model or a modest fee to cover costs and distribution. Participating students will receive title credits as designers and/or developers (as deemed appropriate by supervising faculty) in return for their efforts, should the end result be of distributable quality and design. All aspects of the course will revolve around the production and deployment of this single, class-wide, project. This section will look at exploring an online web-based platformer using the toolset originally developed for Splattershmup: A Game of Art & Motion (http://splattershmup.rit.edu) and incorporating Javascript, HTML5, Canvas, WebGL, SoundJS, and browser-based gamepad support (among other technologies), with native deployment to WinJS, MacOS, Windows, and Linux, as well as browser based support. Students will work in a large, multi-disciplinary team to explore and implement production strategies based on initial ideas and concept-level documentation, with an emphasis on final project implementation, polish, gameplay, and deployment resulting in a commercial quality deliverable. In addition to support and guidance from Professor Phelps, Jennifer Hinton, Assistant Director of the MAGIC Center, will be supporting certain aspects of the class as they relate to marketing, social media, and promotion of the work in progress, Mr. Aaron Cloutier will act as an advisor on software development and Q&A processes. Professor Egert is also available as a technical resource in connection with the MAGIC Laboratory.

**IGME-590-01 iOS & tvOS Game Development** (3 credits): This is a new course.

In this course students will design and build 2D/3D games and media rich mobile applications for the iOS and tvOS platforms. Devices we will be targeting include iPod Touch, iPhone, iPad, Apple Watch, and Apple TV. Topics covered include the mobile game application design process, best practices for each device family, the Xcode IDE, the Swift programming language, 2D and 3D iOS game frameworks, hardware controllers, and software design patterns. Individual and group projects will be required. (IGME-202 Interactive Media Development [4080-330]).

**IGME-590-02 Level Design** (3 credits): This is a new course.

This course introduces level design theory and best practice through game level analysis, evaluation, and creation. Students will learn by analyzing game levels from existing games and discussing what made those levels successful or unsuccessful. Through their analysis and hands on experience, students will gain an understanding of overall level design including layout, flow, pacing, and balance. They will
enhance their understanding of level design principles by creating their own game levels. (Students in Game Design and Development or New Media Interactive Development with third year standing.)

**IGME 590-03 Advanced 3D Asset Production** (3 credits): This is a new course.

In this course, learners will explore all the processes that go into 3D asset creation for games, and how they plug into the current game development pipeline. Topics explored include low polygon modeling, high polygon sculpting for normal map generation, texturing and material map creation, rigging, animation, and importing a character into a game engine. Techniques using the Maya, Mudbox, Photoshop and Unity software packages will be covered. (IGME-219 3D Animation and Asset Production [4080-347]).

**IGME 590-04 German Game Industry** (3 credits): This is a new course.

This course will immerse students in the German games industry via an immersive study-abroad experience. The course will hold several meetings on campus before departure, but the bulk of the course will center on a two-plus-week intensive experience in Germany. RIT students will take accelerated classes at the University of Paderborn with German students, participate in a game jam there over several days, and tour the Nixdorf Museum, the largest museum of computing in the world. Students will then spend the rest of the course visiting German game studios in Dusseldorf and Berlin, the USK and BIU German Game Industry Associations, the Computerspiele (Computer Game) Museum, and possibly members of the German Parliament from the Cnetz in the German Bundestag, if their schedules allow. International travel is required. (4080-381 or IGME-320 or 4080-432 or IGME-330 or permission of instructor)

**IGME 590-05 Seminar in Computational Aesthetics** (3 credits): This is a new course.

Students will design and build creative applications for the browser, while studying the history of computational creativity in the arts, music, and education. The course will cover advanced client-side topics, such as audio and visual libraries and functional programming. Historical topics include foundational discussions of generative art, artificial life, microsound, participatory and process-based art, and creative approaches to computation. Individual and group projects will be required.

### 7 IGM Undergraduate Advanced Elective Project Classes

IGM offers a variety of project-based classes (e.g., Production Studio, Research Studio, and others) in addition to regular courses and seminars that often have term projects. The table below summarizes common project courses. Note that project courses provide an excellent opportunity for developing your portfolio and improving in your skills in a variety of areas. By planning ahead and obtaining instructor approval, students could connect/extend project work through many classes, which would potentially add significant polish.

<table>
<thead>
<tr>
<th>Class</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGME-499</td>
<td>Undergraduate Co-op</td>
<td>If you are on co-op, you must not double-count that work for course credit. RIT requires this distinction when working on a project: pay or credit but not both. For example, if you are working with a professor on a co-op, and that project that has some components happening in Production Studio, you must not enroll in that class.</td>
</tr>
<tr>
<td>IGME-540</td>
<td>Foundations of Graphics Programming</td>
<td>Although game graphics programming requires a team project, it focuses on modern computer graphics technology. If you have taken IGME-309 (&quot;DSA2&quot;), consider IGME-540. There are multiple development-oriented courses in the curriculum (physical computing, AI, engines, and more) that also nicely follow from DSA2.</td>
</tr>
<tr>
<td>IGME-580</td>
<td>Production</td>
<td>Student teams pitch projects to the instructor. Upon approval, students step through the</td>
</tr>
<tr>
<td>Course Code</td>
<td>Studio Type</td>
<td>Description</td>
</tr>
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</tr>
<tr>
<td>IGME-581</td>
<td>Innovation &amp; Invention</td>
<td>“I&amp;I” fosters teamwork for new ideas, not pre-existing projects, across the campus. Although you can use Production Studio to explore new development, you may want to consider I&amp;I.</td>
</tr>
<tr>
<td>IGME-585</td>
<td>Project in FOSS Development</td>
<td>This course is similar to other IGM project courses. However, students focus on the FOSS movement and particular software development practices.</td>
</tr>
<tr>
<td>IGME-588</td>
<td>New Media Team Project</td>
<td>NMID students take this course in their senior year. GDD students are sometimes invited to join the team. This course provides an excellent opportunity to collaborate with New Media Design majors in the design and development of a large-scale project.</td>
</tr>
<tr>
<td>IGME-589</td>
<td>Research Studio</td>
<td>The students work as domain specialists on teams completing one or more faculty research projects during the semester. The faculty member teaching the class will provide the research topic(s). (In IGME-580, the students generate the project ideas.) Students will learn about research methodology to implement, test, and evaluate results of projects. Students will complete research reports and final assessments of themselves and their teammates in addition to completing their assigned responsibilities on the main projects. See also the FAQ below.</td>
</tr>
<tr>
<td>IGME-599</td>
<td>Independent Study</td>
<td>Use this course to pursue something more research-oriented, especially for concepts not explored in-depth in any undergraduate RIT course. You need to contact a professor with a proposal. See also the FAQ below.</td>
</tr>
</tbody>
</table>

### 7.1 Course Listings

Enrollment guides, which are posted along with this document

[https://sis.rit.edu](https://sis.rit.edu) – click on “SIS Course Catalog Search”

[https://www.rit.edu/upub/pdfs/Undergrad_Course_Descriptions.pdf](https://www.rit.edu/upub/pdfs/Undergrad_Course_Descriptions.pdf)

### 7.2 Production/Research Studio FAQ

**Enrollment Requirement**

This course is restricted to students in NWMEDID-BS or GAMEDES-BS with at least 3rd year standing. If you have team members working on your project from outside IGM, please have them fill out the form at “I’m a non-IGM major…” from [https://www.rit.edu/gccis/igm/advising-faq](https://www.rit.edu/gccis/igm/advising-faq).

**How many times can I take Production/Research Studio?**

You can take it as many times as you want as an undergraduate student.

**How many studios will count toward Advanced Electives?**

Students can take any combination of 2 Production and/or Research Studios to count towards their advanced electives (ex: 2 Production Studios, 2 Research Studios, 1 Research Studio and 1 Production Studio). A student may choose to take additional Production and/or Research Studios, but these would count towards their Free Electives.

**What projects can I work on?**

- In IGME-580 Production Studio, students pitch the projects.
- In IGME-589 Research Studio, instructors pitch the projects.

### 7.3 Independent Study FAQ

**This course seems a lot like Production/Research Studio.**

You are correct! In most cases, students should take one of the “studios.” However, when you have a topic you’d like to research or a skill you’d like to develop, an independent study (IS) is a
good option. For example, a NMID student might want to study wearable computing, or a GDD student might want to explore networking in more detail. The main restriction is that there is no comparable IGM class.

**How do I find/generate an IS?**

Unless a faculty member specifically advertises an IS, the work is up to you to find a faculty member, pitch the idea, and develop the proposal. Planning ahead by taking classes, visiting office hours, reading Insights, and talking with your faculty and academic advisors will help.

**Is there a form?**

You can obtain the form from a faculty member or your advisor.

**Who fills out the form?**

Both you and the faculty sponsor. Once your sponsor has obtained the form, please collaborate to fill in the required information. The form has additional instructions. Once complete, the faculty sponsor or the student will bring the completed application to the IGM office for approval from our Undergraduate Coordinator.

**Can I do an IS from outside of IGM?**

Yes, but you must check with your academic advisor in advance to determine if the course will count as an advanced elective (assuming you want it to).

## 8 Who to Contact

Please refer to https://www.rit.edu/gccis/igm/undergraduate-advising. If you have any questions regarding what you read in this enrollment guide, your IAP, or for any other reason, please contact your Academic Advisor ASAP.

Amanda Scheerbaum       Undergraduate A-K   absrla@rit.edu
Kathleen Schreier Rudgers Undergraduate L-Z   kmsrla@rit.edu

Walk-In Advising Hours: Monday-Wednesday, 1:00-3:00 PM and Thursday and Friday: 10:00 AM-12:00 PM