1 What courses should I take?

Students who entered Fall 2018: by now, you should have attended a mandatory advising meeting in which you worked out a plan for the Fall semester. If you did not attend a meeting, please schedule through Starfish (refer to e-mails from your advisor about this meeting). Please use your program flowchart that was given to you at Orientation as well as the Academic Advising Report (AAR) on SIS to plan your schedule. For information on how to access, and use your AAR: https://www.rit.edu/gccis/igm/academic-resources

Students who entered RIT before Fall 2018: you need to follow your program worksheet or flowchart along with your Academic Advising Report (AAR) in SIS. For information on how to access, and use, your AAR: https://www.rit.edu/gccis/igm/academic-resources
Students who entered RIT in (or before) Fall 2012:

- Please contact your academic advisor before enrolling in any classes at RIT. Your advisor will want to ensure that you are not taking duplicate classes due to the quarter to semester conversion.
- 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) 106, 202 and 209

The following IGM courses, IGME-106, IGME-202 and IGME-209, 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.
- If you earn a grade of D or lower in IGME-106, you cannot take IGME-209.

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) or [https://tigercenter.rit.edu](https://tigercenter.rit.edu). All courses are coded with 4 letter subject codes. Courses offered by IGM are listed as IGME courses.

**General Enrollment Questions**: For more information regarding how to use SIS for Enrollment please view [https://www.rit.edu/gccis/igm/academic-resources](https://www.rit.edu/gccis/igm/academic-resources).

**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 class search tool developed by RIT students in partnership with ITS is 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 Fall semester, IGM will once again offer IGME-099: Co-op Preparation, which targets second-year students. This course is required for all Game Design & Development students who started in Fall 2015 and later. 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 Career Services and Cooperative Education 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-1400. Students can enroll through SIS or Tiger Center.

5 IGME Fall Semester Core Course Descriptions

5.1 Reminders

These courses are offered in Fall semester and are required (eventually) of all GD&D majors. They are listed in numerical order. Any prerequisites for a course are listed in parenthesis.

5.2 Descriptions

IGME-99 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-1400. Students who started in Game Design & Development in fall 2015 and later are required to take this course. Ideally, a student will take this course in their second year. Students can enroll in the class through SIS or Tiger Center. 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 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 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)

**IGME-110 Introduction to Interactive Media** (3 credits): 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 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)

**IGME-202 Interactive Media Development** (3 credits): 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 or IGME-106 Game Development and Algorithmic Problem Solving II & MATH-185 Math of Graphical Simulation I)

**IGME-209 Data Structures & Algorithms for Games & Simulations I** (3 credits): 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. ((C- or better in IGME 106 Game Development and Algorithmic Problem Solving II or IGME 201 New Media Interactive Design and Algorithmic Problem Solving III ) and PHYS-111 College Physics I, and MATH-185 Mathematics of Graphical Simulation I)

**IGME-219 3D Animation & Asset Production** (3 credits): 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)

**IGME-220 Game Design & Development I** (3 credits): 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. (GAMEDES-BS and NWMEDID-BS students in year levels 2-5).

**IGME-230  Website Design & Implementation** (3 credits): 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-102 New Media Interactive Design and Algorithmic Problem Solving II or IGME-106 Game Development and Algorithmic Problem Solving II, and IGME-110 Introduction to Interactive Media)

**IGME-235  Introduction to Web Technology for Game Developers** (3 credits): This course introduces web technologies commonly used in the production and distribution of both content focused web sites, and in the creation of interactive applications and games. Students will create web sites and web-native interactive experiences, and publish them to the web. Programming projects are required.

**IGME-236  Interaction, Immersion, & the Media Interface** (3 credits): 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 or IGME-106 Game Development and Algorithmic Problem Solving II, and IGME-110 Introduction to Interactive Media)

**IGME-309  Data Structures & Algorithms for Games & Simulations II** (3 credits): 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 and (MATH 171 Calculus A or MATH 181 Project Based Calculus I or MATH 181A Calculus I or MATH-186 Mathematics of Graphical Simulation II)

**IGME-320  Game Design & Development II** (3 credits): 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 202 Interactive Media Development and IGME-220 Game Design & Development I)

**IGME-330  Rich Media Web Application Development I** (3 credits): 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-230 Website Design & Implementation)

6 Game Design and Development Advanced Elective Courses

6.1 Policies

These courses are advanced elective options for all GDD majors.

For all GDD students who entered RIT in the fall 2161 semester and later, you are expected to fulfill all of your Advanced Elective requirements with IGM classes.

For GDD students who entered RIT in the fall of 2151 and earlier, IGM expects that 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 should 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.

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

6.2 Descriptions

***A note about IGME 317 3D Asset Pipeline for Videogames*** This course is for students in the College of Art and Design degree programs, only.

IGME-340 Multi-Platform Media Application Development (3 credits): Interactive media applications are no longer restricted to personal computers. They can now be found on many distinct hardware platforms including mobile, tablet, wearable, and large-screened computing devices. In this course, students will learn to design, prototype and develop media rich interactive experiences that can be deployed to a wide variety of hardware devices. Programming projects are required. (IGME 106 Game Development and Algorithmic Problem Solving II or IGME 201 Interactive Design and Algorithmic Problem Solving III or equivalent)

IGME 420 Level Design (3 Credits): 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. (IGME-219 2D Animation and Asset Production and IGME-220 Game Design & Development I).

**IGME-421 Tabletop Game Development** (3 credits): This course explores issues pertaining to design, mechanics, development, and production of analog, tabletop “hobby” games, which include board games, card games, wargames, and other non-digital games catering to multiple players. Students will analyze and apply concepts and mechanics of modern tabletop game design, and build and test tabletop games. Students will work with development and prototyping tools, explore component design and art direction, and work with desktop publishing technologies. In addition, they will work directly with board game publishing and manufacturing technologies and services, and study factors pertaining to the business of tabletop games. (IGME 220 Game Design & Development I or equivalent course).

**IGME-430 Rich Media Web Application Development II** (3 credits): 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)

*Additional course notes about IGME-430 Rich Media Web Application Development II*

A primarily Javascript/Node.js server and client course for building rich media web apps (desktop and/or mobile). The class will focus a lot on web servers. We'll be looking at login systems, the MVC (Model View controller) design pattern, the MVVM (Model-View View-Model) design pattern, noSQL databases, memory caching, API design, client-side web frameworks, server configuration & deployment, event-based servers vs threaded servers, dynamic pages & templating, unit testing & more. Though the class is rich web app focused, but the concepts apply to many other software projects across mobile, desktop and consoles.

**IGME-450 Casual Game Development** (3 credits): 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 202 Interactive Media Development)

**IGME-451 Systems Concepts for Games and Media** (3 credits).

This course focuses on systems-based theoretical models of computation in the context of a media-delivery modality. Students will explore concepts such as memory management, parallel processing, platform limitations, storage, scheduling, system I/O, and optimization from a media-centric perspective. Particular emphasis will be placed on the integration of these concepts in relation to industry standard hardware including game consoles, mobile devices, custom input hardware, etc. (IGME 309 Data Structures & Algorithms II)

**IGME-460 Data Visualization** (3 credits): Our world is flooded with data, and making sense of it can be a challenge. Visualizations help by exposing information, trends, and correlations that might otherwise go unnoticed in the raw data. In this course, students will learn to collect, clean, organize, and filter data sets of their own choosing. They will learn and apply principles from multiple fields including visual design, the psychology of perceptions, user experience design, and ethics. They will create static and interactive visualizations with a variety of information structures (hierarchies, maps, timelines, etc). Students will learn to develop exploratory experiences that tell the “story” within the data. Programming projects are required. (IGME-330 Rich Media Web Application Development I)
IGME-470  Physical Computing and Alternative Interfaces (3 credits): 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. (Third-year standing and IGME-102 New Media Interactive Design and Algorithmic Problem Solving II or IGME-106 Game Development and Algorithmic Problem Solving II).

IGME-480 Current Topics in Interactive Development (3 credits): Interactive media development is a rapidly evolving field. This course provides an opportunity for students to learn and experiment with emerging themes, practices, and technologies that are not addressed elsewhere in the curriculum. Topics covered in this course will vary based on current developments in the field. Students will explore, design, and develop creative interactive experiences pertaining to the semester's domain area. Programming projects are required. (IGME-330 Rich Media Web Application Development)

IGME-529  Foundations of Interactive Narrative (3 credits): 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)

IGME-540  Foundations of Game Graphics Programming (3 credits): 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)

IGME-571  Interactive Game Audio (3 credits): 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)

IGME-582  Humanitarian Free & Open Source Software Development (3 credits): 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-585  Project in FOSS Development (3 credits). 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 Humanitarian Free & Open Source Software Development)

**IGME 589-02 Research Studio** (3 credits): Talk to Professor Ian Schreiber for more information.

**IGME-590-01 Undergraduate Seminar: Programming for Technical Art** (3 credits): This course provides students with foundational knowledge and skills in Technical Art. Students will explore a number of research, design, and development techniques for implementing and integrating art in graphical simulations. Students will implement and optimize art in 2d or 3d environments, as well as analyze and debug performance issues. Students will use best practices and modern techniques for development in 2d or 3d environments. Topics may include lighting/shadow performance, asset loading, LOD (level of detail) creation, streaming content, dynamic feature toggling, scripted loading/placement, frame–rate control and building for different devices. (Students should have completed IGME-202 and IGME-219)

**IGME-590-02 Game Balance** (3 credits): An in-depth exploration of the sub-field of game design known as balance. Topics include transitive mechanics and cost curves; probability and the psychology of randomness; random vs. pseudorandom numbers; situational balance; pacing; tuning; statistics, metrics, and analytics; intransitive mechanics and payoff matrices; and the applied use of spreadsheets.

**IGME-590-03 Data-Oriented Game Development** (3 credit): This course emphasizes sustainable software implementation in terms of both efficiency and power usage for game developers through the data-oriented design paradigm. The purpose of all programs, and all parts of those programs, is to transform data from one form into another. Some ways of designing software are more efficient in terms of both speed and power usage. As games challenge the limits of modern hardware and new designs force higher framerates (e.g. VR and 100 fps), data-oriented design has become more important. A deep dive into the data-oriented design paradigm will be emphasized in terms of how hardware, compilers, algorithms, and the data layout of programs can be improved both in terms of speed as well as power usage. Software projects are required.

**IGME-590-04 Advanced Game Physics** (3 credits): This seminar offers an opportunity to focus on advanced topics in game physics. Students will explore modern physical modeling applied to game design and development. Topics include kinematics, numerical integration, rigid & soft-body physics, and fluids. Students will apply mathematical and computational techniques to simulate these physics concepts and learn how to use common physics APIs. The seminar requires programming projects.

**IGME-590-05 Pinball History, Design, Devel** (3 credits): In this course students will learn the history and evolution of pinball games from the earliest versions of Bagatelle through today’s highly digital systems. Students will use a variety of resources including texts (both hard copy and on-line), documentaries, and the archives and exhibits of The Strong National Museum of Play to do research into the history. Finally, they will pitch game concepts and designs as individuals and then form teams around the most successful of these to build working prototype systems.

**IGME-690-01 Data-Oriented Game Development** (3 credit): This course emphasizes sustainable software implementation in terms of both efficiency and power usage for game developers through the data-oriented design paradigm. The purpose of all programs, and all parts of those programs, is to transform data from one form into another. Some ways of designing software are more efficient in terms of both speed and power usage. As games challenge the limits of modern hardware and new designs force higher framerates (e.g. VR and 100 fps), data-oriented design has become more important. A deep dive into the data-oriented design paradigm will be emphasized in terms of how hardware, compilers, algorithms, and the data layout
of programs can be improved both in terms of speed as well as power usage. Software projects are required. (Students should have completed IGME-309 or be part of the GAMEDES-MS program)

**IGME-690-02 Advanced Game Physics** (3 credits): This seminar offers an opportunity to focus on advanced topics in game physics. Students will explore modern physical modeling applied to game design and development. Topics include kinematics, numerical integration, rigid & soft-body physics, and fluids. Students will apply mathematical and computational techniques to simulate these physics concepts and learn how to use common physics APIs. The seminar requires programming projects.

**IGME-790-01 Computational Aesthetics** (3 credits): Students will explore current research on the artistic affordances of the browser, while studying the history of computational creativity in the visual arts, music, games, and education. In addition to creating their own personal works and examining existing tools for creative production, students will be expected to make significant contributions to audiovisual libraries and to disseminate their work. Historical topics include foundational discussions of generative art, artificial life, microsound, participatory and process-based art, and creative approaches to computation. Note: Students should have experience programming in JavaScript or permission of the instructor.

### 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 Studio</td>
<td>Student teams pitch projects to the instructor. Upon approval, students step through the production process to complete their project. This course is flexible and provides an ideal opportunity to develop your expertise, skills, and professional project portfolio. See Research Studio (IGME-589) for professor-generated projects. See also the FAQ below.</td>
</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</td>
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addition to completing their assigned responsibilities on the main projects. See also the FAQ below.

<table>
<thead>
<tr>
<th>IGME-599</th>
<th>Independent Study</th>
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<tbody>
<tr>
<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>
<td></td>
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</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 Independent Study?

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 Independent Study 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.

**IGM Advising:** Monitor your email for updates as advisors return from maternity leaves

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<thead>
<tr>
<th>Name</th>
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**Special enrollment advising walk-in hours schedule (April 1 – April 12): Monday, Tuesday and Wednesday, 2:00-4:00 PM; Thursday and Friday, 10:00 AM-12:00 PM**

Current Semester Walk-In Advising Hours: Monday, Tuesday and Wednesday, 2:00-3:00 PM; Thursday and Friday, 10:00 AM-11:00 AM

To schedule an appointment with your advisor:

[Early Alert](https://sis.rit.edu/info/welcome.do)

[https://mycourses.rit.edu/index.asp](https://mycourses.rit.edu/index.asp)

Steps to Scheduling an Appointment:

1. Log in to SIS or myCourses
2. Click “My Success Network”
3. Click on the link under your primary advisor’s name
4. Click “Schedule Appointment”