



# **Game Development, Design & Analysis Curriculum Framework**

**SIGGRAPH 2002  
San Antonio, Texas**

## Table of Contents

Education Committee 2001 Summary_____	p.03
Student Outreach Summary_____	p.03
“Breaking In” Press Release_____	p.04
Curriculum Framework_____	p.05
Overview of Core Topics_____	p.06
The Full Curriculum Framework_____	p.09
Tying Study Topics to Career Options_____	p.18
Next Steps_____	p.23
IGDA Information_____	p.25

### Contact Info:

International Game Developers Association  
600 Harrison Street  
San Francisco, California  
USA, 94107

Phone: 415.947.6235  
Fax: 415.947.6090  
Email: info@igda.org

Jason Della Rocca  
Program Director  
jason@igda.org

Robin Hunicke  
PhD Candidate, Northwestern University  
hunicke@cs.northwestern.edu

Warren Spector  
Studio Director, ION Storm Austin  
wspector@ionstorm.com

Eric Zimmerman  
Designer/CEO, gameLab  
eric@gmlb.com

## Education Committee 2001 Summary

In 2001, the IGDA's Education Committee made solid progress toward achieving the goals spelled out in its charter. Here's what the Committee members have been up to:

- The "core curriculum" proposal for lectures, courses and programs related to game design, development and analysis was presented at an Academic Summit at the 2002 Game Developers Conference. After incorporating feedback from this event, the curriculum framework was made available through the IGDA website.
- The Committee members have generated lists of university programs, books, magazines and other resources useful to students and academicians. Expanded versions of these resource lists will be made available on the IGDA website, where interested parties will be able to provide reviews and additions based on personal experience.
- The Committee has been active in outreach to students and others wishing to break into the game industry. See the next section for details on our student outreach efforts, including the GDC Scholarships and our high school poster/website project.

Finally, the Education Committee hosted a two-day Academic Summit at GDC in March 2002. This event included panels, lectures and presentations by Committee members, developers, publishers and educators. Topics covered included: The state of industry/academia relations, academia & game industry realities, collaboration case studies and game development/analysis curriculum proposals (including the Committee's own recommendations). One of the major goals of the Academic Summit was to begin identifying research topics that will benefit academia and game development. Discussions from that event will be expanded and explored in the coming year. A similar event, called the IGDA Academic Day will be held during GDC Europe (August 27<sup>th</sup>, London).

It has been a productive year that should provide tangible benefits to IGDA members, the academic community and gaming in general in 2002.

## Student Outreach Summary

The IGDA's Student Outreach programs offer information, encouragement and opportunity to talented young people interested in game related careers. In addition to helping individual students break into the industry, Student Outreach benefits existing development companies by ensuring better-trained, better-qualified entry-level staff. Visit [www.igda.org/students.htm](http://www.igda.org/students.htm) to learn more about Student Outreach.

**IGDA Student Membership:** Discounted student memberships encourage student involvement in the IGDA's global community of game developers. College level students are eligible to join as student members, gaining access to all the benefits of regular membership at a 75% discount.

**High School Outreach:** The IGDA's Education Committee mailed game industry career information and flyers promoting the student section of the IGDA website to 10,000 high school guidance counselors throughout the United States. In addition to giving counselors the knowledge they need to help interested students, the mailing sought to positively impact perception of the industry, explaining that a career in game development is a respected, highly prized profession.

**Breaking In:** Prepared by the Education Committee, "Breaking In" is a section of the website full of information on the game development field, and features profiles of various professional game developers.

**GDC Student Scholarship Program:** The IGDA's Education Committee annually awards 25 scholarships to send qualified students to the Game Developers Conference, where game development professionals from around the world gather to share ideas and build the skills essential to creating the next generation of interactive entertainment.

**Words of Wisdom:** The "Words of Wisdom" series consists of advice to industry newcomers from industry veterans. Barbara Walter, an experienced industry recruiter, collects words of wisdom for the IGDA in addition to moderating a forum dedicated to "newbies".

**Newbie Links:** The "Newbie & Student Links" page at the IGDA website lists articles from external sites on topics of interest to a future game developer: how to set up interviews, resume advice, legal tips for new game development studios, and the like.

**Game Development School Listing:** The IGDA maintains a list of colleges and universities with courses and/or degree programs in game development designed as a starting point for research into potential schools.

The IGDA believes that the business and art form of games will develop best when aspiring developers have the appropriate skill sets for their desired jobs, are well prepared and aware of the realities of working in the entertainment field, and are a diverse group, including women and minorities. For further information on the IGDA's various Student Outreach efforts, visit [www.igda.org/students.htm](http://www.igda.org/students.htm)

## **"Breaking In" Press Release**

### **THE INTERNATIONAL GAME DEVELOPERS ASSOCIATION ANNOUNCES HIGH SCHOOL OUTREACH PROGRAM**

#### **Initiative to Inform Students, Teachers & Parents about Career Paths in Game Development**

SAN FRANCISCO, CA - March 6, 2002 - The International Game Developers Association (IGDA) has launched a nationwide outreach program to educate high school students, guidance counselors and parents on the potential for careers in the video game industry. Informational letters and posters directing students to the IGDA's "Breaking In" web site were sent to over ten thousand high schools across America. This dedicated web site offers information on the various career paths in the game industry, interviews with professional developers who provide advice and insight on getting into the industry and how to best educate yourself, as well as links to additional resources to prepare for a career in games.

"Certainly, one of the most prevalent questions of our industry is how to break in," affirmed Jason Della Rocca, program director, IGDA. "We're here to help students develop skills, make informed decisions and improve their chances of making it; as this multi-billion dollar industry continues to grow, we simply need better educated newcomers."

**For more information please visit <http://www.igda.org/BreakingIn/>**

# THE STUDY OF GAMES & GAME DEVELOPMENT

## IGDA Education Committee Curriculum Framework Proposal

July 19, 2002

### DISCLAIMER

**This curriculum framework is a work in progress. Throughout the last year, Committee members have collaborated to produce a framework that balances scholastic and industry needs. We have critiqued and revised this framework several times, attempting to provide a concise and articulate document - one that is fit for public consumption.**

**The members of the Education Committee look forward to receiving your feedback as we continue to refine our work. With your assistance, we can produce a game studies framework that will further the cause to which we are all committed.**

## I. INTRODUCTION

Electronic gaming, a curiosity twenty years ago, is now one of the most popular forms of entertainment and a pervasive part of global culture. The ubiquity and growth of games requires that we understand them not only as commercial products, but as aesthetic objects, learning contexts, technical constructs, and cultural phenomena.

For gaming to have a healthy future, industry and academia must cultivate a deeper understanding of the ideas that drive electronic gaming, the player experiences games offer and the implications of those ideas and experiences on the aesthetic and cultural significance of this young medium. But progress will only come when academia and industry work together.

This cooperation has already begun. Developers, spurred by increasing risk and skyrocketing development costs, turn with greater frequency to academics for conceptual and technical inspiration. Similarly, academics have begun to recognize the cultural importance of games. As universities begin to design programs for study and research in this area, many institutions are including voices from the industry to help shape their curricula.

The primary goal of the IGDA's Education Committee is to help foster interaction between developers and educators, to speed the evolution of games. Interaction among the disciplines has countless benefits – facilitating the transition of new technologies from the lab into real products, enriching education by bringing industry experience into the classroom, engendering more critical approaches among game creators and fostering a deeper exchange between academics and game developers. The curriculum framework we present in this document—a guide for the development of an educational program in game studies—is at the heart of these efforts.

### About This Document

Game creation is an interdisciplinary endeavour. For this reason, we strongly advocate an approach to game studies education that extends beyond the specifics of particular games, game genres, software packages or development projects. While there is a place for specialization in both industry and academia, even specialists must be aware of other disciplines. The breadth of material covered in this document is a reflection of this belief.

This document is a curriculum *framework*, not a detailed curriculum. Our aim is to describe the basic knowledge areas and skills required to understand, critique and make games, in a format that can be adapted to the resources and curriculum offerings of a range of institutions. It isn't our goal to suggest specific courses, appropriate credit hours or specific degree program requirements. Nor is this framework an attempt to tell developers what areas of knowledge should be important to them.

Instead, this framework establishes a set of *Core Topics*, and an outline of how various combinations of courses feed into some typical game-related careers. These topics and career outlines are general by design. The framework is designed to guide educators in the creation of programs at any level of detail – from individual lectures to fully developed majors, in a single department or across many departments. It is also aimed at students seeking guidance in the creation of individualized game studies curricula at institutions that don't offer such programs.

Because of the number and variety of institutions interested in game studies, no one solution can fit all. While this framework can be used to structure new programs, it is up to individual teachers, institutions and students to adapt appropriate aspects of the framework to their particular educational needs and institutional context.

## II. The Curriculum Framework: Overview of Core Topics

The body of knowledge that constitutes game development, criticism and analysis is a multifaceted and emerging set of disciplines. We have decided to organize these fields of study according to the following high-level categories. We feel that this set of Core Topics addresses the unique practical and theoretical concerns of electronic gaming, while remaining rooted in existing fields of study. These Core Topics are:

- Game Criticism, Analysis & History
- Games & Society
- Game Systems & Game Design
- Technical Skills, Programming & Algorithms
- Visual Design
- Audio Design
- Interactive Storytelling, Writing & Scripting
- Business of Gaming
- People & Process Management in Game Development

Below is a general description of each of these topics. Following these brief overviews is a more fully articulated outline of each Core Topic.

### **Game Criticism, Analysis & History**

*Theoretical and practical analysis of electronic and non-electronic games from a Humanities point of view.*

Included is the development of a critical vocabulary for understanding games and play, some of which is emerging from new Humanities areas like Game Studies and Ludology. The relationship of games to other media, such as literature, film, television, theater and interactive art is a key component of this Topic. Also

included here is game journalism and critical approaches to writing about games. Other study topics include the history of computers, electronic games and toys, as well as issues relating to a canon of significant and/or influential games.

## **Games & Society**

*Ways of understanding games, drawn primarily from the Social Sciences.*

This includes approaches to understanding worldwide gaming culture taken from Sociology, Anthropology and Cultural Studies. Games & Society also looks at smaller group phenomena, including the unique fan cultures of gaming and the social aspects of play. Finally, this Core Topic covers the psychological facets of the game experience including studies of media effects on individuals and groups.

## **Game Systems & Game Design**

*Conceptual and practical concerns that offer a design-centric look at how games create experiences for players.*

This Core Topic includes practical aspects of game design areas (interface design, game documentation, working with testers, etc.), as well as experimental and conceptual topics (play mechanics, experience design, design of gaming spaces, game balancing, etc.). This is the Core Topic most intrinsic to games themselves and is therefore in some ways the heart of the curriculum we outline here. On the other hand, because it is the least understood, trained instructors and quality reference materials are sorely lacking, making it among the most challenging Topics to define and to teach.

## **Technical Skills, Programming & Algorithms**

*Aspects of traditional Computer Science, modified as necessary to address the technical aspects of gaming.*

This includes programming techniques, algorithm design, game-specific programming and the technical aspects of game testing. While much of the material in this area could be taught under the auspices of a traditional Computer Science curriculum some of the material covered can be augmented by specific, applied lessons associated with game creation.

## **Visual Design**

*The many aspects of creating the visual components of games.*

This topic includes visual design fundamentals, both on and off the computer, across a broad range of media. Content areas can range from drawing and illustration to architecture and graphic design to character design and animation. While hands-on training in 2D and 3D graphics can be useful, the emphasis is on fundamental visual design skills rather than on learning specific software packages.

## **Audio Design**

*Creating game sound environments.*

Basic studio skills, sound effects generation and music composition for interactive media all fall in this category. 3D sound processing and DSP tools are covered. Music appreciation and analysis, psychological effects and other audio topics also fall under this Topic. As with the Visual Design Core Topic, the emphasis is on design fundamentals rather than on technical knowledge.

## **Interactive Storytelling, Writing & Scripting**

*Traditional storytelling as well as the challenges of interactive narrative.*

Writers and designers of interactive works need a solid understanding of traditional narrative theory, characterization, plot, backstory and world creation, as well as experimental approaches to literature, theatre and film that have relevance to game design. In addition, interactive storytelling requires familiarity with new tools and techniques, including the technical aspects of writing for this new medium and algorithmic approaches to collaborative story construction. In this Core Topic, these analytical and development tools are applied to the unique interactive storytelling context of games, offering students instruction and experience in the techniques of interactive fiction and dialogue.

## **The Business of Gaming**

*Economic, legal and policy aspects of games.*

The economics of the game industry – the ways that games are funded, marketed and sold and the relationships between publishers, developers, retailers and other companies are all addressed here. In addition, legal issues that affect games, game developers and game players, such as intellectual property and contract law, are part of this Core Topic. Lastly, social and governmental forces that impact the legislation and regulation of game content are also included.

## **People & Process Management in Game Development**

*Practical challenges of managing game development.*

Game development and publishing are complex and collaborative interdisciplinary efforts. Along with all the technical challenges of software development, issues of multidisciplinary content creation, team roles, group dynamics, people management and process management techniques are addressed in this Core Topic.

## III. The Full Curriculum Framework

In this section, we present the complete, expanded list of core study topics. As we said earlier, we do *not* expect any institution to adopt the entire curriculum framework. By selecting appropriate elements from this list, educators can craft lectures, courses and/or programs that meet their needs and the needs of a wide variety of students and game developers. Students can acquire the knowledge and skills necessary to accomplish their goals, whether academic or vocational. Developers can draw from a talent pool with a relatively consistent shared knowledge base, making hiring decisions less risky.

The order in which the material is presented in each Core Topic below reflects a rough sequencing of study, beginning with basic knowledge and proceeding to more advanced courses in a particular study area. These more advanced courses form the heart of the curriculum within a Core Topic. Last in the list are courses that delve deeper into the material of a study area but which may not be necessary for all students or for all career paths.

### Game Criticism, Analysis & History

#### Game Criticism

##### Game studies/“Ludology”

- Critical theory and research
- Critical vocabulary for discussing games and play, including the evaluation of game mechanics and game play, flow and game design
- Establishing and critiquing the canon of influential and/or important games

##### Experience-centered criticism

- Study of interactivity
- Function and uses of exploration
- Encouraging and supporting player “agency”
- Creating and sustaining player immersion
- Supporting the suspension of disbelief

##### Consumer-oriented criticism

- Analyzing and understanding the function and current state of the gaming press
- The function and current state of game reviews
- Tools, techniques and standards of print and media journalism

##### Genre analysis

- What genres exist?
- How are game genres defined?
- History of game genres (genres that have come and gone)
- Are genres useful? How does the application of genre analysis differ when applied to games as opposed to other media?

##### Auteur studies

- Given the collaborative nature of game development, who actually creates a game?
- Does the concept of authorship apply to individual games?
- Does the concept of authorship apply to an individual’s body of work as a whole?

## Media Studies

Introduction to media history, theory and criticism

History

- Non-electronic games
- Computers
- Electronic games
- Preservation of Digital Technologies

History, theory and criticism of mainstream/commercial and experimental media

- Literature
- Radio
- Movies
- Television
- Art
- Theatre
- Comic Books
- Architecture

Research

- Introduction to mass media/pop culture research
- General media effects research
- Game-specific research

## Games & Society

### Players and Effects

Gaming demographics

- Gender and diversity
- Childhood, education and child development
- Understanding the choices and patterns of buyers and players

The “Cultures” of Gaming

- Pop Culture: Games as icons and cultural artifacts
- Fan Culture: Game communities and the people who inhabit them
  - Why communities form
  - How to encourage the creation of fan communities and how to sustain them
  - Fan communities from related media
- Mass Culture: Cultural dialogue about games
  - Games in other media (film, television, books, etc)
  - Games in the larger perspective of computer acclimation into culture

### Experience of Play

Historical aspects of the experience of play

- History of play

- Cross-cultural anthropology of play
- Commonalities and differences of games across national boundaries

#### Social aspects

- How games create “safe spaces” for play
- How they are used in social settings
- How they support and break traditional social roles

#### Emotional aspects

- How emotional responses are triggered and manipulated by games

#### Cognitive aspects

- Theories of intelligence
- Applicability of developmental models

#### Psychological aspects

- How games rely upon and affect our understanding of ourselves and others

#### Human/machine interaction

Uses of games in medical, training, therapeutic and other non-entertainment applications

## Game Systems & Game Design

### Game Design (Conceptual)

#### Play Mechanics

- What are game "rules"?
  - How should they be structured?
  - How do you create the right balance of obstacles/aids, penalties/rewards?
- When are games too hard, too easy? Why?
- What sorts of play mechanics work best for what sorts of people?

#### Boardgame and Roleplaying design

- Thinking about design algorithmically

#### Ideas

- Generating new ideas
- Turning ideas into game concepts
- Evaluating game concepts

#### Game theory

- The study of strategic decision-making in competitive and cooperative situations

#### Abstract design elements

- Positive and Negative feedback systems
  - Game balancing tools
  - Player rewards and punishments
- Emergent complexity
  - Interactions among systems that lead to unique player experience
- Simulation & Emulation
  - Using systems that allow flexible response versus specific behaviors for preconceived situations

#### Psychological design considerations

- Operant conditioning
- Addiction in gaming
- Rewards and penalties

- Creating diverse social systems
- Bringing players back to the game

#### Interface design

- Computer UI theory
- Balancing player control schemes -- simplicity versus expressiveness.
- The impact of specific hardware constraints – controllers, keyboards, headsets, etc.

## Game Design (Practical)

#### Spatial design

- Gameplay spaces
  - Representational spaces
  - Abstract spaces
  - Space and pacing
  - Space and narrative
- Creating densely interactive, highly responsive worlds

#### Task design

- Action and interaction
  - World/geometry interaction
  - Character interaction
  - Puzzles
- Providing adequate feedback to players

#### Design integration

- Melding space and task
- Integrating art and gameplay

#### Control schemes

- Movement
- Items and item manipulation
- Inventories

#### Training

- Supporting learning with consistent challenges and appropriate feedback.
- Communicating with the player regarding challenges, actions and abilities within the game world

#### Game tuning

- Understanding games as dynamic systems
- What makes a balanced game
- Working with Quality Assurance and understanding play-test feedback
- Applying game tuning strategies in light of feedback from actual play

#### Play testing & player analysis

- Understanding who your audience is
- Selecting test subjects
- Designing for diverse populations
- What criteria to use to measure success with a given audience
- Play test procedures

#### Design implications of platform choice

## Technical Skills, Programming & Algorithms

### Math and Science techniques

- Basic Newtonian physics
- Computational mechanics
- Linear algebra
- Differential equations

### Style & design principles

#### Information design

- Data structures
- Environmental models, spatial data structures

#### Prototyping

- Tools and skills for fast, iterative development
- Building flexible systems, configurable by others

#### Testing

- Code review and test harnesses
- Designing tests and incorporating feedback from Quality Assurance
- Bug fixing, bug databases, creating stable code bases

#### Programming teams – structure and working relationships

#### Design/Technology synthesis

- Supporting player goals and actions
- Building intelligent, coherent, reactive game environments
- Platform issues

#### System architecture for real time game environments and simulations

#### Data-driven systems

- Building flexible systems for non-programmers to use

#### Game logic

#### Multimedia programming

- Graphics
  - Rendering
  - Animation
  - Graphics System Design
- Sound

#### Artificial intelligence

- Path planning
- Agent architectures
- Decision-making systems

#### Networks

- Networking and Server design
- Performance metrics
- Topologies
- Protocols
- Security

#### Tools for designers and play analysis

- 3D GUI creation
- Play testing to monitor player frustration, progress and enjoyment

## Visual Design

### Basic Visual Design

- Art history & theory
- Fundamentals of drawing
- Painting techniques
- Sculpting
- Anatomy and life drawing
- Physiology and kinesiology
- Visual design fundamentals
  - Composition
  - Lighting and color
  - Graphic design

### Visual design in an interactive context

#### Motion Graphics

- Animation
- Cinematography
- Camera angles and framing
- Visual narrative
- Non-narrative graphics/Abstraction as expressive tool

### Fundamental principles of architecture

#### Introduction to visual asset generation

- 2d graphics
- 3d modeling

#### Architecture

- History of architecture
- Real-world spaces vs. game spaces

#### Advanced Visual Asset generation

- Textures
- Interface design
- Character design
  - Conceptual design
  - Character modeling
  - Character animation

#### Working with 3d Hardware

- Procedural shading
- Lighting
- Effects

#### Game Art (digital based art with game content)

#### Visualizing Information

## Audio Design

### Audio history & theory

## Basic technical skills

### Basic studio skills

- Familiarity with hardware and software (e.g., microphones, mixers, outboard gear)
- Recording, mixing and mastering.
- Studio organization

### Audio Design Fundamentals

- Setting mood, managing tension and resolution
- Processing, mixing and controlling sound for aesthetic effect
- General workflow for game creation
- Audio engine terminology and functionality

### Introduction to Interactive Audio

- Designing sound for interactivity
- Sound effects
- Music
- Voice recording

### Sound Effects

- Simulation of sound environments
- Ambience versus musicality in soundtracks

### Music

- Composition
- Interactive scoring

### 3d Audio

- Fundamentals of 3D and multi-channel sound.
- Modeling for effects, echo, room size simulation

## Storytelling, Writing & Scripting

### Story in Non-Interactive Media

- Literary Theory & Narratology
  - Aristotle
  - Traditional narrative “act” structure
  - Thinking abstractly and concretely about “story”
- Characterization in fiction, film and theatre
- Introduction to film and literary theory
- Theories of game and narrative
- Context-setting versus traditional storytelling
- Back-story and fictional setting design
- Creating compelling characters

### Approaches to interactive narrative

- Alternating fixed story with interactive game
- Branching trees
  - Branching narrative
  - Branching conversation
- Emergent narrative approaches
- Object-oriented approaches

- Hypertext
- Interactive fiction

#### Writing for other media

- Fiction-writing
- Screenwriting
- Playwriting

## Business of Gaming

### Basics of game industry economics

- Marketing and sales: How games currently reach an audience
- Retailers, shelf-space: How audiences currently reach the games
- Platform choices – the tradeoffs of developing for consoles, PCs and handheld devices
- Internationalization/globalization of development.

### Audience

- Understanding audiences for different game genres
- How to reach and keep given audiences
- Consumer behavior and psychology (what do consumers of various sorts and various populations want?)

### Publisher/Developer Relationships

- The deal
  - What it covers
  - How it gets done
  - What it is likely to say
- Day-to-day: Once signed up, what interactions and processes occur

### Intellectual property

- Technology
- Content
- Licenses
  - Acquisition of licenses
  - Use of licenses
  - Working with licensors

### Patents and the game industry

#### Contracts

- Publisher/developer
- Employer/employee
- Contractors

#### Content Regulation

- Industry Ratings
  - US
  - Overseas
- Government regulation
  - US
  - Overseas

## People & Process Management in Game Development

People management and collaborative development

Team make-up

- Job descriptions
- Recruiting
- Balancing talent, experience, budget

The phases of game development

- Pre-production
- Production
- Testing

Work flow

- Knowing which tools to use and when
- Problem evaluation and investing appropriate resources

Group dynamics

- Team building
- Establishing clear roles and clear goals
- Realities of development teams
- Building effective teams
  - Working as a team to realize a unified gameplay vision
  - Delegation and responsibility

Design documentation

- Why document?
- What should you document?
- How much documentation is enough/too much?
- To storyboard or not to storyboard?

Scheduling

- Creating a schedule
- Goals of a schedule
- Balancing quality and reality
- Working with a schedule, using it to help you ship

Communication skills

- Rhetoric
- Communicating with peers, supervisors and subordinates
  - Communicating clearly in print and in speech
  - Collaboration skills - speaking the same language

Coordinating the efforts of development, quality assurance, sales, marketing, public relations and finance

Localization issues, processes and skills

Product post-mortems

- Evaluating decisions, after the fact
  - Design decisions
  - Process decisions
  - Business decisions

## IV. Tying Study Topics to Career Options

The next section of this document addresses how these Core Topics might be organized as preparation for specific professional roles. There are many more jobs, career paths and roles that can and must be filled in game development, criticism and education – the list below is in no way meant to be definitive or complete. These are simply examples to show how the curriculum framework can be “sliced” in different ways to meet different needs.

Courses we feel are not required but merely recommended for adequate education and training are presented in *italics*. All other listings represent elements of gaming education the specialties can't do without.

### Game Studies Scholar & Educator

As universities and colleges add courses and even majors in game studies, this creates a need for trained educators in the field. We will discuss what an educator or scholar with a specialization in game history, theory and criticism might expect to study.

Ideally, though not necessarily, a game studies scholar would have practical experience developing games. Any instructor at the college/university level should take *all* courses in his or her field of expertise but, more importantly, understand the material at a fundamental level.

#### Game Criticism, Analysis & History

- All courses

#### Games & Society

- All courses

#### Game Systems & Game Design

- Game Design (conceptual)
- *Optional: Game Design (practical)*

#### Storytelling, Writing and Scripting

- Narrative Theory
- *Optional: Interactive narrative techniques*

#### People & Process Management in Game Development

- Collaborative development

#### Optional: Business of Gaming

- *All courses*

### Game Technology Educator

We define this position as an instructor who specializes in training the next generation of game programmers and technologists. It might also include someone who engages in games-oriented research projects. This position requires a deep understanding of the current state of technical innovation and procedures in the field of game development. Also desirable is knowledge of game theory and design and the people/process issues surrounding game development. Ideally, this person would be capable of building and directing a group engaged in research into next generation game and simulation technology.

The technical requirements for this position are higher than for a programmer and require delving deeply into research oriented projects at the graduate level. Game industry experience is a definite plus.

#### Game Systems & Game Design

- Game Design (practical)
- *Optional: Game Design (Conceptual)*

#### Technical Skills, Programming and Algorithms

- All courses

#### Visual Design

- Visual design fundamentals

#### Audio Design

- Audio design fundamentals

#### People & Process Management in Game Development

- All courses

### Game Journalist

The gaming press has traditionally been dominated by self-taught fan/writers. We believe that journalistic standards, generalized tools, critical methodologies and formal training should be available to people who want to write about games. In this example, we focus on the training and skill set needs of someone who aspires to be a game critic.

In addition to the courses listed below, a game journalist should take appropriate journalism and creative writing classes.

#### Game Criticism, Analysis & History

- All courses

#### Games & Society

- All courses

#### Game Systems & Game Design

- Game Design (conceptual)
- *Optional: Game Design (practical)*

#### Storytelling, Writing and Scripting

- Narrative Theory
- *Optional: Interactive narrative techniques*

#### *Optional: Business of Gaming*

- *All courses*

### Producer

This title means different things at different studios and publishing houses. For purposes of this example, we define a “producer” as the person responsible for managing the people and processes associated with the development of the game. The producer works with the development team to create and manage schedules, maintain the budget and ensure that the finished product meets the needs of the publisher funding it.

## Business of Gaming

- All courses

## People &amp; Process Management in Game Development

- All courses

## Game Systems &amp; Game Design

- Game design (practical)
- *Optional: Game design (conceptual)*

## Technical Skills, Programming and Algorithms

- Basic programming techniques

## Visual Design

- Visual design fundamentals

## Audio Design

- Audio design fundamentals

## Storytelling, Writing and Scripting

- Narrative theory
- *Optional: Interactive narrative techniques*

*Optional: Games & Society, Criticism, Analysis and History*

- *All courses*

**Game Designer**

Like “Producer,” this title has many different interpretations. For our purposes, we will define a “Game Designer” (sometimes referred to in the game industry as the “Project Director” or “Lead Designer”) is the person responsible for conceiving the overall vision of a game and then coordinating the efforts of the team members to ensure that the vision is realized to the highest degree of fidelity and quality.

In addition to the courses listed below, a game designer should take at least an introductory programming course and probably more advanced courses focusing specifically on the needs of gaming.

## Game Systems &amp; Game Design

- All courses

## Storytelling, Writing and Scripting

- All courses

## Technical Skills, Programming and Algorithms

- Basic programming techniques

## Visual Design

- Visual design fundamentals

## Audio Design

- Audio design fundamentals

## People &amp; Process Management in Game Development

- Collaborative development
- Process management

*Optional: Business of Gaming*

- *All courses*

*Optional: Games & Society*

- *All courses*

## Level Designer

A different kind of game designer, a Level Designer is the person who actually implements a game's minute-to-minute player experience. This job is most typically associated with the creation of 3D worlds for first-person shooters or third-person action games. We define "Level Designer" as the person who uses content-creation tools crafted by programmers to place and manipulate assets generated by artists. The level designer creates the game world and engineers the player's gameplay experience, working in the service of an overall vision that is typically crafted by the Game Designer.

As was the case with game designers, in addition to the courses listed below, level designers should have some structured training in programming.

### Game Systems & Game Design

- All courses

### Technical Skills, Programming and Algorithms

- Basic programming techniques

### Visual Design

- Visual design fundamentals
- Architecture

### Audio Design

- Audio design fundamentals

### People & Process Management in Game Development

- Collaborative development
- Process management

### *Optional: Storytelling, Writing and Scripting*

- *Narrative theory*

### *Optional: Games & Society*

- *All courses*

## Programmer

Despite increasing specialization in the industry, most beginning programmers need a broad base of skills in order to get a job in game development. For the purposes of this discussion, we focus on the skills and training required to get a job as an entry-level programmer with a mid-size game development studio.

### Game Systems & Game Design

- Game Design (practical)
- *Optional: Game Design (conceptual)*

### Technical Skills, Programming and Algorithms

- All courses

### Visual Design

- Visual design fundamentals

### Audio Design

- Audio design fundamentals

### People & Process Management in Game Development

- Collaborative development
- Process management

*Optional: Storytelling, Writing and Scripting*

- *Narrative theory*

*Optional: Games & Society, Criticism, Analysis and History*

- *All courses*

### Game Graphics Artist

As is the case with programmers, the context in which an artist works determines the specific skills he or she requires. For our purposes, it is enough to say that a beginning game artist should have a broad understanding of his or her field. Again, we focus on the skills and knowledge expected of an entry-level graphic artist at a mid-size game development studio. Such an artist wouldn't be expected to be master of any one aspect of his or her field but should have a working knowledge of a variety of specializations.

### Game Systems & Game Design

- All courses

### Technical Skills, Programming and Algorithms

- Basic programming techniques

### Visual Design

- All courses

### Audio Design

- Audio design fundamentals

### People & Process Management in Game Development

- Collaborative development
- Process management

*Optional: Games & Society*

- *All courses*

*Optional: Storytelling, Writing and Scripting*

- *Narrative theory*

## V. Appendices (Next Steps)

The work of the IGDA Education Committee is not limited to the creation of the curriculum framework above; we still have much work to do. The next steps in the Committee's efforts are outlined below.

### **Sample Lectures, Courses & Programs**

This addendum to the curriculum document will consist of three sections, with related but different purposes associated with reality-checking the Committee's work.

First, we will offer an overview of 3-5 existing game development courses and/or programs. We'll look at these case study programs with an eye toward identifying how they reflect the thinking behind the framework. Where they *don't* reflect such thinking, we'll discuss what that tells us about the framework and/or the institutions offering the courses/programs.

Second, we'll use the framework to generate new, original curricula and courses. We do not intend these to be used, as is, in real-world situations. Rather, our goal is to provide models of a few of the ways the framework can be used to achieve different institutional or student goals.

Third, we hope to offer user-generated analyses of existing or original lectures, courses and major/minor programs. We'll be looking for volunteers outside the committee to draft brief reports outlining how the framework does (or doesn't) fit what they're already doing. Similarly, we'll be looking for volunteers to take the framework, use it to create a lecture, course or degree program and talk about the ways in which the program was (or was not) useful. Finally, we'll be looking for volunteers who've used the framework to assist in getting an institution to introduce game studies course or program to share their thoughts on how the framework was useful in dealing with institutional bureaucracies and biases.

### **Physical/Technical Requirements**

It is difficult to discuss a canon of games if you can't actually have hardware capable of playing the games. Similarly, it's hard to demonstrate interface design and/or 3D graphics or rendering techniques without appropriate hardware. And a course on networking is going to be of somewhat limited utility without an actual, functioning network.

This addendum to the framework document will address and explore the physical, technical and IT requirements associated with creating a game studies program. Issues include: gaming network setup and maintenance, graphics hardware and compatibility issues, pc hardware and console gaming needs.

### **Bibliography**

As an appendix to the curriculum framework proposal, we will make available a list of books, magazines and other resources useful to game developers and academics. This list will be linked specifically to topics included in the curriculum, serving as an introduction to each of the Core Topic areas.

These references will be treated in detail, starting with standard bibliographic information and including specific commentary from committee members and select real-world users. We will, where possible, list which institutions and educators use which books and for what purpose, offering testimonials from real-world users from the worlds of development and academia. Additional books, magazines and other relevant materials will be listed, with far less detail, as "further reading."

We are considering creating a web-based version of the bibliography including numerical ratings of each book's primary characteristics. Sample characteristics might include readability, depth of treatment, length, price, language, etc. We hope online users/reviewers will help us determine the appropriate rating in each category, allowing potential users to home in on the books, magazines and other materials that most closely meet their needs.

### **Course and Program Survey**

The final component of our curriculum work – a game studies course and program survey -- is likely to be made available on the IGDA website. This survey will list existing universities, colleges and other institutions that offer courses and/or degrees in gaming and will be very much a work in progress, changing and growing as new programs are offered and as old programs get phased out.

Our initial goal isn't to provide an exhaustive survey but, rather, to make available an annotated list of some of the available programs. Our long-term plan is to provide links to institutional websites, where available, to offer specific course outlines and descriptions and to provide faculty listings. In the long run, we plan to make the program list searchable by institutional focus (research, vocational, 2-year, 4-year, design-oriented, tech, art, etc.). Eventually, active systems will be introduced to allow users to rate, review and add to the data available at the website.

# International Game Developers Association

## The professional organization for developers of computer & video games

Foster the future of game development by tapping the power of your peers around the globe. As the creators of the art and science that drive a \$20B industry worldwide, we have the potential to influence the business of games, inspire millions and establish games as the true art form of this century.

**Get involved** – join the International Game Developers Association today. By becoming an IGDA member, you support our mission to build a community of game developers that leverages the expertise of our members for the betterment of the industry and the development of the art form. And, you gain access to a variety of great benefits and programs, including:

**Member benefits** – a free subscription to Game Developer magazine anywhere in the world, discounts on the Game Developers Conference and other industry events, discounts on products and tools related to game development and much more.

**Local IGDA Chapters** – where members connect to create regional development communities. Chapter members network, learn from each other, identify upcoming challenges and issues, and help define the characteristics of the professional community where they live and work.

**The Game Developers Choice Awards** – to recognize the amazing talents of those in our industry and the games they make. The IGDA presents the Game Developers Choice Awards to promote games as an art form and increase artistic recognition for developers. The IGDA is also a proud supporter of the Independent Games Festival.

**Committees to address issues of concern to our industry** – such as the media's perception of violence in games, abusive software patents and gender balance and equity. The IGDA's Online Games Committee presents its first annual white paper on the state of the online game business at GDC 2002.

**GDC Scholarship Awards** – to help students develop their skills and to provide the industry with better educated newcomers, the IGDA's Education Committee sends 25 college students to the Game Developers Conference each year.

**Please help us continue to advance games and game development as a craft.  
Join today.**

**[www.igda.org/join](http://www.igda.org/join)**