

TECHNOLOGY OF GAMES, ESPORTS, AND WEB APPLICATIONS (STREAM ENGINEER)

Course Description

This course provides an integrated understanding of **game technology, esports ecosystems, and web-based streaming engineering**, combining technical, creative, and industry practices. Students will explore **game development pipelines, real-time systems, human-computer interaction, and streaming infrastructures**, followed by a **capstone media project across 13 creative industry domains**.

Game technology education typically includes programming, graphics, interaction design, and multimedia systems, preparing students for real-world industry production . Meanwhile, esports integrates ICT systems, platforms, and human-computer interaction within competitive environments .

Learning Outcomes

By the end of this course, students will be able to:

1. Understand game development ecosystems and esports infrastructure
 2. Design and implement web-based streaming systems
 3. Apply HCI principles in interactive media
 4. Develop cross-media digital projects
 5. Produce a capstone project integrating multi-industry media domains
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SESSION PLAN (16 MEETINGS)

SESSION 1 – Introduction to Game Technology & Industry Ecosystem

Topics:

- Game industry overview (AAA, indie, mobile)
- Game lifecycle (concept → production → release)

Activities:

- Lecture + case study (global game studios)
 - Discussion: “What defines a successful game?”
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SESSION 2 – Fundamentals of Game Design & Mechanics

Topics:

- Gameplay, rules, systems thinking
- Game design documentation

Activities:

- Create simple game concept (group)
 - Design pitch (5 minutes)
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SESSION 3 – Game Engine & Technology Architecture

Topics:

- Game engines (Unity, Unreal)
- Rendering, physics, AI systems

Activities:

- Demo engine workflow
- Analyze game engine architecture

(Game programming includes real-time rendering, physics, and AI systems)

SESSION 4 – Human-Computer Interaction (HCI) in Games

Topics:

- UX/UI for games
- Player experience design

Activities:

- UX critique of popular games
 - Redesign UI concept
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SESSION 5 – Web Application for Streaming Systems

Topics:

- Streaming architecture (OBS, CDN, WebRTC)
- Backend vs frontend systems

Activities:

- Build simple streaming workflow diagram
 - Hands-on OBS setup simulation
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SESSION 6 – Esports Ecosystem & Industry Structure

Topics:

- Teams, leagues, tournaments
- Business model & monetization

Activities:

- Case study: esports tournament
- Role mapping exercise

(Esports includes stakeholders such as teams, leagues, sponsors, and platforms)

SESSION 7 – Data, Analytics & Media Intelligence in Streaming

Topics:

- Viewer analytics
- AI & recommendation systems

Activities:

- Analyze Twitch/YouTube data patterns
 - Dashboard design exercise
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SESSION 8 – Pre-Capstone Planning (Project Proposal)

Topics:

- Project ideation
- Media convergence strategy

Activities:

- Proposal presentation
 - Feedback session (panel review)
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CAPSTONE PROJECT (SESSION 9–16)

All 13 domains must be integrated across sessions

SESSION 9 – Capstone: Animation & Visual Design + Comics

Focus Domains:

- Animation & Visual Design
- Comics

Activities:

- Create visual identity (style guide)
 - Storyboard & comic adaptation
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SESSION 10 – Capstone: Digital Advertising + Digital Journalism

Focus Domains:

- Digital Advertising
- Digital Journalism

Activities:

- Campaign concept (ads + storytelling)
 - Content writing (news/article format)
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SESSION 11 – Capstone: Esports + Game Development

Focus Domains:

- Esports
- Game Development

Activities:

- Build gameplay prototype / esports concept
 - Define tournament or gameplay mechanics
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SESSION 12 – Capstone: Fashion & Lifestyle + HCI

Focus Domains:

- Fashion & Lifestyle
- Human-Computer Interaction

Activities:

- Design UI/UX for lifestyle-based game/app
 - Branding & audience targeting
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SESSION 13 – Capstone: Toy Development + Interactive Media

Focus Domains:

- Toy Development
- Interactive Media

Activities:

- Develop physical/digital hybrid concept
 - Prototype interaction model
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SESSION 14 – Capstone: OTT & Media Intelligence

Focus Domains:

- OTT Platforms
- Media Intelligence

Activities:

- Design streaming platform strategy
 - Content distribution mapping
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SESSION 15 – Capstone: IP & Media Conversion + Film & Photography

Focus Domains:

- IP & Media Conversion
- Film & Photography

Activities:

- Adapt IP across formats (game → film, etc.)
- Produce visual assets (photo/video)

SESSION 16 – Capstone: Music & Audio + Final Presentation

Focus Domains:

- Music & Audio

Activities:

- Integrate sound design & audio identity
- Final project presentation + evaluation panel

ASSESSMENT

Component	Weight
Participation	10%
Assignments	25%
Mid Project Proposal	15%
Capstone Project	40%
Final Presentation	10%

KEY REFERENCES (LATEST ≥2021 – APA STYLE)

1. Gregory, J. (2022). *Game Engine Architecture* (3rd ed.). CRC Press.
2. Białecki, A., et al. (2024). Virtuality engineering in esports. *International Journal of Electronics and Telecommunications*.
3. ISTQB. (2022). *Game Testing Certification Syllabus*.
4. UNLV. (2023). *Esports Management Syllabus*.
5. IIITN. (2025). *Game Design & Development Syllabus*.
6. Rogers, S. (2021). *Level Up! The Guide to Great Video Game Design*. Wiley
7. Newman, J. (2023). *Videogames*. Routledge

8. Kim, T., & Thomas, M. (2022). Streaming Media Architecture and Web Systems

OUTPUT

- 1 Capstone Project (multi-domain media integration)
- 1 Pitch Deck (industry standard)
- 1 Functional Prototype (game / streaming / hybrid media)
- 1 Academic Reflection / Documentation