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| Module Title: | Gameplay Programming II | |
| Language of Instruction: | English | |
| Credits: | 10 | |
| NFQ Level: | 7 | |
| Module Delivered In | No Programmes | |
| Teaching & Learning Strategies: | This module is delivered as a mix of traditional lectures and practical sessions within a laboratory setting with a blend of interactive lectures and practical work. Learners are actively participating in class work throughout each scheduled session. Students will be assigned practical exercises that address the learning outcomes. | |
| Module Aim: | To give the student a thorough understanding of the application of physics to gameplay for mobile platforms. | |
| Learning Outcomes | | |
| On successful completion of this module the learner should be able to: | | |
| LO1 | Design, implement and demonstrate 2D game prototypes for mobile platforms; Incorporating physics simulations based on mathematical modelling. | |
| LO2 | Use an appropriate networking API to exchange game data with other game clients in realtime. | |
| LO3 | Design and implement a rudimentary multiplayer game, which includes physics elements, for mobile platforms. | |
| LO4 | Incorporate particle physics into computer games and debug by comparing computer output to results predicted by theoretical physics. | |
| LO5 | Simulate the physics of the collision of regular rigid body shapes in 2D using the full theoretical application. | |
| Pre-requisite learning | | |
| Module Recommendations | | |
| This is prior learning (or a practical skill) that is recommended before enrolment in this module. | | |
| No recommendations listed | | |
| Incompatible Modules | | |
| These are modules which have learning outcomes that are too similar to the learning outcomes of this module. | | |
| No incompatible modules listed | | |
| Co-requisite Modules | | |
| 4418 | PROG H4203 | Prog for Games Devices I |
| Requirements | | |
| This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. | | |
| Successful completion of year 2 or equivalent. | | |

Module Content & Assessment

| Indicative Content |
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| 1. Applied Physics Content to include Particle kinematics and dynamics (projectiles, circular motion, particle systems, Forces, force fields, gravitational fields, friction, fluid resistance, pressure, buoyancy, springs with damping, torque: Approximation Methods: Rigid body dynamics (centres of mass, moments of inertia, torque, angular velocity and acceleration,): Collisions (conservation of linear and angular momentum, Newton's law of restitution, impulse on collision, resolution of collisions in 2D. Applications in 2D rigid body.) |
| 2. Introduction to mobile development environments. |
| 3. Creating game menus and navigating between them. |
| 4. Deploying and debugging an application on a mobile device. |
| 5. Supporting multiple screen resolutions. |
| 6. Loading game data from external resources. |
| 7. Fundamentals of mobile 2D game programming: sprites, collision detection, game input, audio, timers, animation. |
| 8. Modelling collisions in 2D. |
| 9. Designing movement systems: walking and jumping, managing collision boundaries. |
| 10. Modelling projectile motion with and without air resistance. |
| 11. Modelling deformable soft physics bodies using physics joints. |
| 12. Modelling physics concepts eg buoyancy |
| 13. Networking: Using a networking library to exchange messages with other clients in realtime. |

| Assessment Breakdown | % |
|----------------------------------|--------|
| Project | 30.00% |
| Practical | 30.00% |
| End of Module Formal Examination | 40.00% |

No Continuous Assessment

| Project | | | | |
|-----------------|---|-------------------|------------|-----------------|
| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
| Project | Mobile Project 1 | 1 | 15.00 | Sem 1 End |
| Project | Mobile Project 2 (develop multiplayer game and publish) | 3 | 15.00 | n/a |

| Practical | | | | |
|-----------------------------|------------------------|-------------------|------------|-----------------|
| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
| Practical/Skills Evaluation | Practical Work | 1,2,3,4,5 | 30.00 | Sem 1 End |

| End of Module Formal Examination | | | | |
|----------------------------------|------------------------|-------------------|------------|-----------------|
| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
| Formal Exam | n/a | 1,4,5 | 40.00 | End-of-Semester |

Module Workload

| Workload: Full Time | | |
|----------------------------|--------------------|--|
| <i>Workload Type</i> | <i>Frequency</i> | <i>Average Weekly Learner Workload</i> |
| Laboratory | 20 Weeks per Stage | 4.00 |
| Lecture | 20 Weeks per Stage | 2.00 |
| Independent Learning | 20 Weeks per Stage | 2.00 |
| Total Hours | | 160.00 |

