

# PA199 Game Engine Development 1: Introduction, Organization Notes

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Semester: Autumn 2024

# Goal of the Course

Deepen knowledge and experience with game development:

- ▶ Advanced theory at lectures
- ▶ More “low level” approach to game programming
- ▶ Individual term project

# Organization

- ▶ Lectures – gamedev theory – engines, math, **physics**, etc.
- ▶ Seminars – consultations for projects
- ▶ Home work – on term project
  
- ▶ Participation:
  - ▶ lectures – not mandatory, recorded (not this year)
  - ▶ seminars – mandatory, allowed up to two unexcused absences
  
- ▶ Grading based on:
  - ▶ term project
  - ▶ oral exam

# Organization – Grading

- ▶ Base requirements:

- ▶ Implement all base requirements of the term project.
- ▶ Pass the oral exam.

Failing in any of these requirements will result in grade F.

- ▶ Grade: based on the number of „bonus“ points:

- ▶ A: 4+
- ▶ B: 3
- ▶ C: 2
- ▶ D: 1
- ▶ E: 0

## Bonus Points Sources:

- ▶ Mid-term Milestone: 0–1
- ▶ Project: 0–5
- ▶ Exam: 0–2

# Lectures Topics

- ▶ Today
    - ▶ Organization, project intro (jch)
    - ▶ Templates metaprogramming (MT)
  - ▶ Game Engine Architectures (jch)
  - ▶ Rotations and quaternions (MT)
  - ▶ Particle system dynamics (MT)
  - ▶ Solving differential equations (MT)
  - ▶ Unconstrained motion of rigid body (MT)
  - ▶ Constrained motion of rigid body (MT)
  - ▶ Forward and inverse kinematics (MT)
  - ▶ Fluid simulation (MT)
  - ▶ Virtual environments and interaction techniques (jch)
  - ▶ Exam topics - preparation to the exam, consultations
- Order can change...

# Organization – Semestral Project

- ▶ Goal
  - ▶ implement your own game engine (stub of it) from the scratch (not really)
  - ▶ Implement simple game (inspired by „Breakout“) in your own engine
- ▶ Full semester project, individual work beyond seminars expected
- ▶ See assignment in IS for details.

# Possible Seminars Schedule

1. Setup of GIT repos and the template. Math if time...
2. Math
3. Camera
4. Camera 2
  
5. Building geometry 1
6. Building geometry 2
7. Texturing and lighting

## Milestone

8. Physics 1 - basic motions, basic collisions
9. Physics 2 – collisions
10. Physics 3
  
11. Above minimum features
12. ...
13. ...