**Elective Course Description Winter Term 2022/2023**

### Title
- **GameDev Tips & Tricks - (C#, C++)**

### Cluster Title PO 07
- To be filed by focus managers

### Cluster Title PO 2012
- To be filed by focus managers

### Cluster Title PO 2014
- Game Development

### Date of first course event / first organizational meeting with students
- 24.10.22 18:00

### kind of room if not indicated above
- online
- Seminarraum
- Labor

### Course Data
- Credit points: 5 credit points
- Workload/semester: 125-150 h
- Presence/week on average**: 4 SWS
- Group size according to cnw:
  - Min. size: 8 students
- Weekday of course:
  - MON/WED

<table>
<thead>
<tr>
<th>Frequency of course-events</th>
<th>Weekly</th>
<th>Bi-weekly</th>
<th>Blocked</th>
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<tr>
<td>Prospective timeframe****</td>
<td>Block 1 8:30 Block 2 10:15 Block 3 12:00</td>
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<td>Block 4 14:15 Block 5 16:00 Block 6 17:45</td>
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### Course Language
- English x
- German

### Suitable for students of course/focus
- DM
- AG x
- IMD
- MP
- SMP
- ER x
- OJ/WJ/OK
- KMI x

### Content(s): (check one or more)
- Design
- Informatics / Technology x
- Economy / Business
- Culture

### Time frame in case of blocked event
- 11 Sessions: 24.9., 26.9., 31.10., 2.11. 7.11., 9.11, 14.11, 16.11, 21.11, 23.11, 28.11, 22, 5.12. 18:00 – 21:00

### Course Portrait
- **Lecturer(s) Name(s)**: Thomas Valentin Klink
- **Lecturer(s) email**: thomask@crytek.com
- **Contact Prof. @ fbmd**: Tilmann.kohlhaase@h-da.de
- **Teaching Method**: lecture lecture + seminar x seminar project

### Course Contents
**GameDev Tips & Tricks**

Over the last years I have given electives on game engine development and the internal workings of frequently used, but not often understood concepts like networking, multithreading or serialization. During these electives a lot of topics came up that I deemed interesting to talk...
about but would not fit within the context of the electives I was giving. With this elective I want to talk about a pool of topics that all by themself would not warrant their own elective but combined could make for an interesting amalgamation of hands-on experience and general programming tips that can make your everyday work easier.

Some topics we will take a look at:
- **Code Reflection**
The ability to let code inspect code is powerful but it doesn’t happen often that we see an actual real world example of this. For this I will demonstrate how code reflection can be used to mitigate boilerplate code and even improve performance sometimes.

- **Effective Debugging**
When do we attach a debugger to an application? What can we do with it? What is a crash dump? When should we resort to simple logging? What are data breakpoints? What are unit tests? Debugging games can be a very complicated and broad topic but I want to give some insight into more effective debugging of games.

- **Optimization**
There are endless ways of achieving better performance in your games so I want to give some general purpose tips on effective use of data structures in code and more widely known techniques such as object pooling.

- **Tool Development**
Writing your own tools is fun and can often lead to substantially less work on your hand. There is this saying that by spending hours on writing a tool you can save minutes of doing it by hand but while this can be the case, quickly throwing together a functional tool can be a good time saver under the right circumstances. I already have a good amount of topics I can cover but if you have ideas yourself that you always wanted answered but that you did not know how to approach, feel free to send me a message and perhaps we can talk about it in this elective as well.

Prerequisites: General interest in programming, general understanding of C# is mandatory, understanding of C++ in addition is a bonus.

<table>
<thead>
<tr>
<th>Type of Exam</th>
<th>homework</th>
<th>work+presentation</th>
<th>paper</th>
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<tr>
<td>Milestones if known</td>
<td>Examination</td>
<td>Examination / Presentation</td>
<td>End of Elective</td>
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Suitability
beginner course
intermediate course
advanced course

Preconditions
Prerequisites: General interest in programming, general understanding of C# is mandatory, understanding of C++ in addition is a bonus

Info about lecturer (especially if guest)
Valentin Klink is Senior Gameplay Programmer at Crytek

Other information
* According to our examination law, the course titles have to be matched to a given catalogue with common course titles. This title will appear in the Transcript of Record and the Bachelor Certificate. Field has to be filed by Focus Managers, all clusters can be found below
** The official presence-time is 3 SWS for the whole semester. As the elective period is condensed to 12 weeks instead of 16 weeks, the presence time for the electives is 4 SWS.
*** Courses and focal points: er = Expanded Realities, oj = Online Journalismus, wj = Wissenschaftsjournalismus, blank field = please insert appropriate course, (check as many as apply)
**** Block 1 = 8.30 - 10.00 Uhr, Block 2 = 10.15 - 11:45 Uhr, Block 3 = 12.00 - 13.30 Uhr, Block 4 = 14.15 - 15.45 Uhr, Block 5 = 16.00 - 17.30 Uhr, Block 6 = 17.45 - 19.15 Uhr
***** In case that the course does not start in the first week 15.10.2018 there has to be a first organisational meeting to finalize the application process

Elective Start: 17.10.2022
Christmas 24.12.-8.1.23 (due to the short semester there might be some flexible lecturing during this period.,) Electives End 10.2.2023 (Examinations could be scheduled after this date if necessary)

Please upload in Moodle Course!