



HÖGSKOLAN I GÄVLE

PROGRAMME SYLLABUS

Creative Computer Graphics

Programme Code: TGCKK

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Programme Syllabus

**Study Programme in
Creative Computer Graphics**

(Creative Computer Graphics)

This programme syllabus applies to students admitted to the autumn semester of 2010 or later.

STUDY PROGRAMME IN CREATIVE COMPUTER GRAPHICS

at Högskolan i Gävle

1 General Arrangement

The education is divided into three main phases. The initial phase Platform Knowledge and Skills intend to provide the student with the basic skills and knowledge central to the student's future profession.

The second phase, Consolidation and Specialisation, mainly consists of a large project which gives the student the opportunity to consolidate and develop the own knowledge and skills acquired in phase 1. Here, the students specialise in some area by their own choice, and in certain important special techniques.

In the third and completing phase, Academic and Business Preparatory Specialisation, the purpose is to finally prepare the student for the future profession, or for continuation in the current research field.

Theoretical and practical studies are alternated in the education, often as projects.

2 Expected Learning Outcomes

2.1 Expected Learning Outcomes for First-cycle Programmes According to the Higher Education Act, Chapter 1, Section 8, and Qualification Descriptor According to the Higher Education Ordinance, Appendix 2

2.1.1 Expected Learning Outcomes for First-cycle Programmes According to the Higher Education Act, Chapter 1, Section 8.

First-cycle studies should essentially expand upon the knowledge that pupils acquire on national or specially designed programmes in upper-secondary school, or equivalent knowledge. The government may, however, grant exemptions regarding programmes in fine, applied and performing arts.

First-cycle studies should develop the students' ability to

- make independent and critical assessments,
- independently discern, formulate and solve problems, and
- preparedness to address changes in the working life.

Within the field of the education, the students should, in addition to knowledge and skills, develop the ability to

- search and evaluate knowledge on an academic level,
- follow the knowledge development and
- exchange knowledge also with individuals without expertise in the area.

2.1.2 Qualification Descriptor According to the Higher Education Ordinance, Appendix 2

Bachelor's degree

Extent

Bachelor's degree is achieved when the student has successfully completed required courses of 180 HE credits with certain specialisation decided by each higher education institution, including at least 90 HE credits of progressive specialisation in the programme's main field of study.

Expected Learning Outcomes

Knowledge and Understanding

For a bachelor's degree, the student should

- Demonstrate knowledge and understanding in the programme's main field of study, including knowledge of the disciplinary foundation of the field, knowledge of applicable methods in the area, advanced studies in some part of the field and orientation in current research.

Skills and Abilities

For a bachelor's degree, the student should

- demonstrate the ability to search for, collect, evaluate and critically interpret relevant information in a problem, and to critically discuss phenomena, issues and situations
- demonstrate the ability to independently identify, formulate and solve problems and to carry out assignments within given time frames,
- demonstrate the ability to account for and discuss information, orally and in writing
- problems and solutions in dialogue with different groups, and
- demonstrate the skills required to work independently within the field of the education.

Judgement and Approach

For a bachelor's degree, the student should

- demonstrate the ability to make assessments with consideration to relevant scientific, social and ethical aspects, within the programme's main field of study
- demonstrate an understanding of the role of knowledge in society and of people's responsibility for how it is used, and
- demonstrate the ability to identify the own need of additional knowledge and to develop the own skills.

Thesis (degree project)

For a bachelor's degree, the student must have successfully completed an individual assignment (degree project) of at least 15 HE credits within the programme's main field of study, and within the framework of the required courses.

Other

For a bachelor's degree with a certain specialisation, the specific

requirements decided by each higher education institution within the framework of the requirements in this qualification descriptor, should also apply.

2.2 Specific Learning Outcomes of the Programme

Creative Computer Graphics is an interdisciplinary education with a specialisation in artistic work in digital media.

The basis is the computer as a tool for 3D modelling, animation and special effects.

The purpose is that after completed education, the students should have the opportunity to work with digital technology for graphic work in film, games, entertainment and in the industry. The student should also have acquired a sufficient basis to expand upon to be able to participate in the development of technology and applicable methods in the area.

The following expected learning outcomes apply to the programme, in the respective main learning outcome category:

Knowledge and Understanding

After completed education, the student should have understanding and knowledge about:

- the technical, theoretical and methodological conditions for Computer Graphics and the connected technical and artistic work
- the medium as a messenger
- the aesthetic understanding that constitutes the basis for good modelling and design

Skills and Abilities

Through the education, the student should have developed required skills and abilities to:

- be able to independently carry out modelling and animation projects with good results
- independently develop necessary support tools, such as script programs, effects filters and/or plug-ins to streamline work in such projects
- lead and follow up projects in the area and prior to such projects, be able to identify and structure problem areas and direct the work towards its solution

Judgement and Approach

The student should:

- be able to decide when development of current tools, and special adaptations and development of support tools it appropriate in order to streamline work in a CG project, and when it is not
- be able to choose among several available technologies for a certain problem
- be able to structure a problem and critically review and absorb the contents of relevant advanced research literature, and adopt an approach which means to, as far as possible, search complete information about a problem before the own solutions are presented
- have the entrepreneur's view on the industry to be able to take on assignments also on international basis
- demonstrate the ability to formulate search questions and seek information in relevant sources
- demonstrate the ability to interpret and write references
- be able to account for the difference between scientific material and other types of material
- be able to follow the knowledge development in the own subject area
- be familiar with the forms of scholarly communication and publication
- demonstrate the ability to review, analyse and evaluate both the search process and search results
- demonstrate the ability to present criteria for assessment of sources of information and application of these

3 Description of the Programme

The study programme includes three main fields of study.

These are Computer Graphics (CG), Computer Science and Mathematics (CSM) and Media and Communication Studies (MCS).

In addition to these, a course in entrepreneurship is given, which is included in the main field of Economics and Entrepreneurship (E).

3.1 Main Fields of Study

3.1.1 Computer Graphics

Computer Graphics is the established description of an interdisciplinary field which to a large extent includes computer science research issues as well as artistic and technical activities. That is the interdisciplinary specialisation of the education and therefore the main field of study for the education is Computer Graphics.

Most of the courses on the programme belong to this main field of study.

3.1.2 Main Field of Study Computer Science and Mathematics

The field of Computer Graphics is combined with a developed computer science and technical expertise in computer science and mathematics, where the technical foundation in Computer Graphics is developed. Programming, mathematics and computer graphics are included, as well as advanced methods for image processing.

3.1.3 Main Field of Study Media and Communications

The role of technology as an information carrier etc. is studied in the area of Media and Communication Studies.

The art of storytelling and narratology are also included.

3.2 Teaching and Examination

3.2.1 Teaching

The teaching on the programme is mainly project and laboratory session-oriented.

The student's development of practical skills is in focus, while related theoretical knowledge of the technical conditions for the work are gradually added in parallel with the practical work.

3.2.2 Examination

Examination often focusses on the student's ability to learn a good working method and to deliver adequate results on time, while the theoretical foundation is validated as well. Courses are often examined through presentations of minor or major projects, where both the final results and the work steps up until the final results should be presented and evaluated. Examinations may occur in the cases and parts where theory is in focus.

3.2.3 Progression

The programme consists of three main phases.

- (1) Platform Knowledge and Skills,
- (2) Consolidation and Specialisation, and
- (3) Academic and Business Preparatory Specialisation.

Platform Knowledge and Skills (PKS)

The purpose of this phase is primarily to build up the necessary basic knowledge and skills, where the focus is on current tools and theories behind the tools. The first two courses (Design and Modelling and Animation) provide an aesthetic and artistic basis, combined with the basics of three-dimensional modelling and animation.

Based on the understanding of how 3D tools work, a theoretical insight into the machinery carrying out the work is given.

This occurs in the course Computer Graphics and Mathematics I.

In parallel to this, another knowledge field, media and communication studies, is initiated through the course Introduction to Film and Storytelling, which covers the narrative role and dramaturgy of film.

In the next phase, the skills in 3D modelling and animation are developed, while the student learns more about media and graphic design. At this stage, the student should be able to apply the knowledge of narration in film and use this in the laboratory sessions and projects carried out in Modelling and Animation II.

With knowledge of three-dimensional design, animation techniques and how these may be used in narration, it is time to become familiar with another branch of technology within the field, namely compositing and special effects. This takes place in the course Digital Post-production and Special Effects.

By now, the student has also acquired a developed understanding of how different technologies may be used in various ways to achieve the characteristics in the images that are sought, how special effects are created and how this work is connected with the modelling and filming preceding the process. Now that the student has the necessary knowledge about and skills in the tools and work process, the time has come to specialise in technology.

In the course Programming and Scripting, the student will acquire knowledge of a technology to develop and specially adapt the tools so that the work within a project is carried out more efficiently.

In order to do this, a basic understanding of programming, which is included in this course, is required. Before the consolidation phase begins, there are some additional fields that must be covered.

The first is television graphics, which is a hot field, and which is covered in the course Motion Graphics, where graphic design in

advertising and television is in focus. In parallel with this course, the students will also specialise within Media and Communication Studies by studying Digital Film and Video Production.

The next field is game design which is covered in the course Game Design and Development. Here, the student will use the knowledge and skills in design and modelling acquired in the previous courses, to create a game idea and develop it.

The course may emphasise design or programming, depending on interest of each student. The purpose is to create effective game ideas and to develop expertise in how games are developed. At the same time, the students begin their journey towards the advanced fields of 3D modelling and animation in the course Character Animation.

Now, the whole arsenal of modelling and animation knowledge from the previous courses is used, in order to finally achieve realistic animations of living characters, synchronise speech etc.

All courses in this phase should result in advanced knowledge and skills prior to the consolidation and specialisation phase that follows.

Courses in this Phase:

Design Techniques,	7.5 HE credits
Modelling and Animation I and II,	7.5 + 7.5 HE credits
Computer Graphics and Mathematics I,	7.5 HE credits Introduction
to Film and Storytelling,	7.5 HE credits
Digital Post-production and Special Effects,	7.5 HE credits Introduction
to Programming,	15.0 HE credits
Game Design and Development,	7.5 HE credits
Motion graphics,	7.5 HE credits Typographic
Design for Digital Media,	7.5 HE credits
Digital Film and Video Production,	7.5 HE credits

Total: 90.0 HE credits

Consolidation and Specialisation

The emphasis of this phase is on a major project, which is carried out during the spring semester in year two. The purpose of the project is to further educate the students in the art of running and following up more extensive projects. The project is carried out in student project groups, where the students have to agree on the area of responsibility

of each group member. Then the students should create, describe and realise an idea, or develop a given theme.

The project contains some lectures and seminars, which aims to give the students an understanding of project work and other related, interesting fields. The purpose of the project is the film and art festival at the end of the year. This festival is carried out together with the third year students, who present and exhibit their degree projects at the same time.

Courses in this Phase:

Character Animation,	7.5 HE credits
Project,	15.0 HE credits
Special Techniques for Modelling,	7.5 HE credits

Total: 30.0 HE credits

Academic and Business Preparatory Specialisation

Since the second phase is completed and the third academic year begins, we also begin to direct our focus more towards what comes after the education. For most students, it means working at a studio or freelancing, but for some it could mean continued studies towards higher academic levels, if there is interest in research in the area. The last phase intends to develop additional preparation for both paths.

The first period of the first semester contains academic courses. The course Advanced Image Processing provides further theoretical specialisation in the computer graphics field, where the technological methods for image and effects development are studied. An additional specialisation in computer graphics with a specialisation in shader programming is carried out in parallel with this.

The second period of the semester contains entrepreneur-oriented courses. Courses in applied modelling and design within two important fields are given, Design Visualisation and Multimedia Production and Web Graphics. Both courses may very well be carried out so that the student locates parts of the course at a company, by carrying out a connected assignment for the company.

Prior to the degree project at the end, the student is prepared for this through courses where both research methods and the conditions of entrepreneurship are in focus. Hereby, the student should develop the security to work on an international market.

Courses in this Phase

Computer Graphics and Shader Programming,	7.5 HE credits
Design Visualisation and VR Technique or Studio Work,	15.0 HE credits
Multimedia Production and Web Graphics,	7.5 HE credits
Research Methods,	7.5 HE credits
Entrepreneurship,	7.5 HE credits
Degree Project,	15.0 HE credits
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Total:	60.0 HE credits

3.3 Placement

Several parts in the education provide possibilities to connect with the industry. The major project midway through the education (15 HE credits) may very well be carried out as an assignment for a company. Also in other courses, there are possibilities to work with assignments directed towards the industry, especially in the degree project at the end of the education.

3.4 Student Influence

There is a council for educational affairs linked to the programme, which consists of representatives from the working life, teachers and students. The council for educational affairs is advisory, and the faculty programme director is the chairman. Gefle Student Union appoints student representatives.

Apart from the programme council, students have the possibility to participate in the activities of the higher education institution through representatives in the different boards and councils where students should be represented, according to ordinances.

3.5 Internationalisation

Högskolan i Gävle has a large international contact network and several agreements with higher education institutions and universities abroad. At the higher education institution, there is an international office that can give information about which exchanges are currently available at each given date.

Also within the framework of this education, there may be opportunities to locate certain parts of the education abroad through exchange studies.

4 Courses in the Programme

A summary of the courses currently included in the programme and when they are given is provided here.

Each course is stated with the respective phase code where:

PF = Platform Knowledge and Skills

CS = Consolidation and Specialisation

AB = Academic and Business Preparatory Specialisation

In the table, the level of the courses is also stated, where F stands for First cycle.

The students have guaranteed admission to the courses within the programme. Course applications for the following semester must be submitted. Changes in the order of courses may be made in consultation with students in the programme. Alternative course choices may be made in consultation with the faculty programme director, provided that the expected learning outcomes for the programme are fulfilled.

Changes in the programme courses are determined on board level, change of period when courses are given is determined on department level.

Year 1

Period	Course Name	HE credits	Phase	Level	Main Field
1:1	Design Techniques	7.5	PF	F	CG
1:1	3D Modelling I	7.5	PF	F	CG
1:2	Computer Graphics and Mathematics	7.5	PF	F	CSM
1:2	Basics in Creative Film Making	7.5	PF	F	MCS
1:3	3D Modelling and Animation II	7.5	PF	F	CG
1:3	Typographic Design for Digital Media	7.5	PF	F	MCS
1:4	Digital Post-production and Special Effects	7.5	PF	F	CG
1:4	Digital Film and Video Production	7.5	PF	F	MCS

Year 2

Period	Course Name	HE credits	Phase	Level	Main Field
2:1	Motion Graphics	7.5	PF	F	CG
2:1-2:2	Introduction to Programming	15.0	PF	F	CSM
2:2	Character Animation.	7.5	CS	F	CG
2:3	Game Design and Development	7.5	PF	F	CG
2:3	Special Techniques for Modelling	7.5	CS	F	CG
2:4	Project	15.0	CS	F	CG

Year 3

Period	Course Name	HE credits	Phase	Level	Main Field
3:1	Design Visualisation and VR Technique or Studio Work	15.0	AB	F	CG
3:2	Computer Graphics and Shader Progr.	7.5	AB	F	CSM

3:2	Multimedia Production, Web Graphics	7.5	AB	F	CG
3:3	Scientific Methods in Computer Science	7.5	AB	F	CG
3:3	Entrepreneurship	7.5	AB	F	E
3:4	Degree Project	15.0	AB	F	CG

5 Entry Requirements

General entry requirements and specific entry requirements 4, i.e. the following specific entry requirements:

<i>Subject</i>	<i>Course</i>
English	B
Mathematics	C
Social Studies	A

The grade for each of the above subjects should be at least Pass.

6 Grades

Grades are given for the programme courses according to relevant course syllabus.

7 Examination Regulations

7.1 Title of Qualification

Degree of Bachelor of Science in Computer Science with a major in Computer Graphics.

Filosofie kandidatexamen i datavetenskap med inriktning mot Computer Graphics.

7.2 Qualification Criteria

To receive a certificate for a bachelor's degree with a specialisation in Computer Graphics, the student must have successfully completed courses of at least 180 HE credits. The higher education qualification should contain the courses included in the programme or equivalent.

7.3 Degree Certificates

Students who fulfil the requirements for higher education qualification may receive degree certificates on request. Each degree certificate includes a diploma supplement that describes the education and its place in the education system (the Higher Education Ordinance, chapter 6, section 15). The appendix is called Diploma Supplement. The Diploma Supplement should facilitate

recognition and credit transfer of a Swedish higher education qualification in employment and continued studies abroad, but also in Sweden.

8 Further Instructions

Students admitted to the Study Programme in Creative Programming before the autumn of 2006, follow the programme syllabus for that year.

For students admitted to the later part of the programme and for students who have had approved leave from studies, a specific study plan is established by the faculty programme director in consultation with study advisers.