

# Studieplan 2020/2021

## Virtual and Augmented Reality

**Studiepoeng: 60**

### Studiets nivå og organisering

The level and organisation of the study programme

It is a full-time advanced degree programme lasting one study year.

### Bakgrunn for studiet

#### Background for the study programme

Virtual reality (VR) and augmented reality (AR) are expected to be the next big computing environment due to the rapid development of the area over the past few years. Virtual and augmented reality are already being integrated into a number of industries such as healthcare, tourism, risk management, advertising, entertainment, automotive, gaming, education and space industries. VR and AR will play a major role in the future in learning and education, entertainment, edutainment, industry and science, so it is important to educate and train people within the field to meet the growing demands.

The education provides a program that targets the key areas of virtual reality (VR) and augmented reality (AR). Virtual Reality (VR) is an immersive digital environment that can replicate lifelike physical environments or portray a fictional artificial world, and makes the user feel they are immersed in that environment in real-life. Augmented reality (AR) is created by enhancing real life objects/environments with a digital overlay. It is a professional education offering specialisation in VR and AR. The study programme have both a technical and artistic approach to the field of expertise within an entrepreneurial and professional environment through work placement in EON Norway.

The study programme in Virtual and Augmented Reality combines technical and artistic subjects with VR and AR technology in interactive digital content development.

The study programme aims to develop further the students' ability for comprehensive

thinking and to give them a broad understanding of VR and AR as tools and methods for problem solution in a wide range of work tasks. It also aims to prepare students for working life either as an employee or as an entrepreneur with their own company. The education will give awareness and understanding of modern interactive and immersive technologies, knowledge transfer, skills building and preparation for digital sector carrier and work experience.

The programme is delivered in partnership with EON Reality, the leaders in Virtual Reality and Augmented Reality based knowledge transfer, through the Interactive digital center (IDC) Eon Norway, which provides opportunities for graduates to become VR/AR professionals, and have direct access to an established industry developing VR/AR content for education and industry. Highly skilled professionals from EON Reality will contribute to the teaching and guidance.

## Læringsutbytte

### Learning outcome

On successful completion of the study programme, a student has the following total learning outcome defined in terms of knowledge, skills and general competence:

### Knowledge

The student

- has knowledge of Virtual Reality and Augmented Reality
- has knowledge of production pipelines in a corporate setting
- has specialised knowledge of the production of content for VR and AR productions
- has in depth knowledge of critical thinking, communication and problem solution linked to content development
- knows of national and international research and development work that is relevant for VR and AR development
- has advanced knowledge of 3D content creation

### Skills

The student

- can master and apply relevant professional tools, methods and theory for VR and AR content creation
- can master design processes from idea to end product
- can apply professional knowledge and relevant results from research and development work underlying VR and AR productions

- can to reflect on his/her own professional performance and adjust it under supervision
- can find, assess, use and refer to relevant research and development work, artistic and technical development work and other pertinent professional material
- can master critical thinking, logic, communication and problem solution
- can work creatively and use relevant methods for content production in problem solution

## General competence

### The student

- can analyse, plan and carry out varied work tasks and projects over a protracted time period, alone and as a group participant, and in accordance with ethical requirements and guidelines
- has insight into relevant professional and work ethical issues, and is able to contribute to a professional community
- can inspire and facilitate entrepreneurship, new thinking and innovation and to involve local working, social and cultural life
- can disseminate central subject matter orally and in writing, to take part in professional discussions within the subject area and share his/her knowledge and experiences with others

## Målgruppe

### Target group

The target group for the study programme is primarily applicants interested in creative art and/or technology. The study programme is suitable for students who wish to focus on the use of different technologies, and those who wish to develop their skills in digital content production. It is a cross-disciplinary program where both technical and creative thinking is needed. To develop interactive digital VR and AR content there is a need to understand the underlying technology as well as digital art.

The applicants are interested in enrolling for the industrial, education or edutainment environment and have an educational background within Autodesk Maya, 3D Studio Max (or similar), game development, user interface for both mobile platform application and traditional computer platforms, Audio Video planning, design and integration or Audio Video systems design.

## Relevans for arbeidsliv og videre studier

## Relevance for working life and further studies

The programme immerse students directly into a professional context through real world projects. A problem-based teaching approach promotes entrepreneurial thinking and knowledge.

The students get the skills needed to be successful in creating Virtual Reality and Augmented Reality content for industry and education. These skills will also enable students to work in fields like architecture and product visualization, game creation, multimedia design, and broadcast media. The education also provides knowledge that may form a basis for continued work in the education sector and in research and development work.

The study programme provides competence in combining relevant up to date digital tools, techniques, methods, forms of expression and concepts relating to creative processes in VR and AR production. The programme also provides good specialisation in a field, but at the same time also broad knowledge to make the students more attractive for working life and equipped for the technological future. The program focuses on content creation for edutainment, industry and education. The education give the applicants opportunity to work on the next generation of edutainment solutions that combine innovative entertainment concepts with the world's leading VR and AR knowledge transfer software. To develop mission critical training applications for areas such as Energy, Medical and Industrial, and to develop new virtual labs, lead pilot projects, and roll-out virtual 3D learning environments.

The students may apply for a two-year theoretical Master's degree programme in Digital Communication at Inland University of Applied Sciences (IUAS). It is also possible to take relevant further education abroad.

## Opptakskrav og rangering

- A Norwegian bachelor's degree or an education recognized as being equivalent to a Norwegian bachelor's degree.
- Your degree from higher education must include at least 80 ECTS credits or equivalent in game technology, 3D Animation, digital art, computer science, game design or similar fields.

## English Language requirements

Applicants must document their proficiency in English at a certain level.

The English language requirements applies to all except applicants native to UK, Canada, Ireland, New Zealand, Australia or the nordic countries, who do not require to document any language proficiency.

You will find the [list of accepted courses and minimum scores accepted here](#).

#### Interview

Based on the application, applicants who meet the admission criteria could be invited for an admission interview for further approval. Candidates will be selected based on their qualifications and experience, and outcomes of the formal interview when conducted. Candidates are responsible of their own application and interview costs.

## Arbeids- og undervisningsformer

### Teaching methods

The teaching is based on lectures, creative exercise in the practical field, small group learning/ group work for experimental and cognitive processes, presentations, work placement with involvement into commercial activities and self-study.

Most of the courses are practical with great emphasis on assignments and problem-based learning, and entail compulsory work requirements, both individually and in groups. All activities are compulsory. The students have to be present 80% of the time as a minimum to get examination.

In addition to organised teaching and supervision, the students shall acquire knowledge, skills and professional insight through self-study. The students are personally responsible for following up their own studies. This can be review materials, case studies examples, video tutorials and research on given subjects.

The education requires great efforts from the students. If they are to be well equipped for working life in this field, it is important that they set aside a lot of time for their own study work. In addition, some of the courses require the students to hand in assignments every week in order to achieve the necessary progression and reach an adequate level academically and professionally.

There is compulsory attendance for laboratory work and lectures, which is detailed more precisely in the teaching plan. All compulsory practical and theoretical assignments must be completed within set dates in accordance with the given assignment. Assessment and supervision are an important part of the learning process. There must

be continuous contact between student and lecturer during the planning and execution of work assignments.

The students have to participate in a range of teaching activities each week. This include classes, seminars, practicals and online interaction. More information about the individual unit details can be found in the course structure.

Expenses occurred in connection with any excursions must be paid by the student himself/herself.

The characteristic nature of the study programme is based on portable computer equipment. A computer and software are prerequisites for being able to follow all of the study programme's courses. The University in collaboration with EON Norway provide a VR/AR computer laboratory and advice on the purchase of computer and software for own use.

## Vurderingsformer

### Assessment methods

Graded letter marks are used, from A – F, where E is the lowest pass grade. Varied assessment forms are used, both written individual school examinations and individual and group-based portfolio assessments. The examination can be given in Norwegian.

## Forskningsbasert undervisning

### Research-based teaching

The study programme keeps up-to-date by using new literature, new technology, research and methods.

The students have the opportunity to work with internal and external partners on research and development projects linked to the education.

## Internasjonalisering

### Internationalisation

The teaching in all courses will be given in English.

The students will be working within an international environment in collaboration with the international company EON Reality/EON Norway and partners. EON Reality is one of the world leaders within the field of content creation for VR and AR knowledge transfer

for education, edutainment and industry. For more information about the EON Reality, see: [www.eonreality.com](http://www.eonreality.com)

## Studiets oppbygging og innhold

### The contents, structure and organisation of the study programme

The first semester (30 ECTS credits) consist of subject-specific theory and content development. The semester covers introduction and project management, 3D modelling, rigging and animation, basics of interactive 3D development, interactive 3D app development, JavaScript in VR apps development, CAD, DCC -> VR conversions, shaders / software development, immersive systems development, kinect and immersive solutions, mobile interactive 3D application development and mobile VR AR.

The second semester is work placement (30 ECTS credits) with project based training for VR and AR content creation, professional workflows, and project management, e-groups, student's individual development path via experience, assessment based on roles in the projects, idea promotion and incubation, sales / production / marketing / and installation support.

The students obtain broad knowledge of their chosen specialisation, experience of VR and AR production and cross-disciplinary group work.

For more information about the study programme's courses and progression see the overview of courses.

The students will undertake a work placement at Eon Norway. This will provide an opportunity to apply and consolidate the learning from courses, experience workplace culture and workplace practices, explore career options and develop a professional network before graduating.

Students will develop their entrepreneurial skills through supervised project based learning on real customer projects. At the end of the course, students will have a robust portfolio of work showing off their projects. During the work placement, students will have ongoing feedback sessions with teachers and professionals, individual and group tasks, capstone presentation to Management at the end of the training, peer review evaluations and a final exam with work presentation that is graded. For detailed information about the work placement, see description in the course plan.

The classes are held close to Campus Hamar.

## Kull

2020

### Semester table

Emnekode	Emnets navn	S.poeng	O/V *)	Studiepoeng pr. semester	
				S1(H)	S2(V)
2IAVRP21	<u>Introduction to VR/AR Production</u>	5	O	5	
2DAVRP21	<u>Development for VR/AR Production</u>	8	O	8	
2CCAVR21	<u>Content Creation for VR/AR</u>	7	O	7	
2AVRMP21	<u>VR/AR on Mobile Platforms</u>	5	O	5	
2PASAVR21	<u>Programming and scripting for VR/AR systems</u>	5	O	5	
2AVRPP31	<u>VR/AR Professional Practice</u>	30	O		30
Sum:				30	30

\*) O - Obligatorisk emne, V - Valgbare emne



# Emneoversikt

## 2IAVRP21 Introduction to VR/AR Production

Emnekode: 2IAVRP21

Studiepoeng: 5

### Semester

Høst

### Språk

English

### Krav til forkunnskaper

None

### Læringsutbytte

#### Learning outcome

On successful completion of the course, the student has acquired the following learning outcome:

#### Knowledge

The student

- has knowledge of current and past development paths in virtual reality and augmented reality market

- has knowledge of the differences and common areas between virtual reality and augmented reality
- has knowledge of the full workflow stages in interactive 3D content development that involve use of virtual reality (VR) and augmented reality (AR)
- has knowledge of how to produce functional storyboard for basic interactive content for various platforms
- has knowledge of how to apply project management technique SCRUM for small projects
- has knowledge of how to recognize and identify various reference materials and focus on 3D content
- has knowledge of how to use and made basic transformation on various CAD/DCC formats for further VR/AR use
- has knowledge of how to practically convert the 3D files and use optimization of the graphic features

## Skills

The student

- can set up a production plan for a Virtual Reality and Augmented Reality projects
- can take 2D CAD/DCC geometry through a 3D pipeline for 3D interactive Productions

## General competence

The student

- can give professional reasons for the decisions made during the development process both in writing and orally
- can take part in professional discussions regarding the structure of Virtual Reality and Augmented Reality projects

## Innhold

### Contents

- Introduction to subject of virtual reality and augmented reality
- History and present state of the solutions
- Hardware and software solution overview
- Immersion and Stereoscopy - 3D vision role in interactive VR applications
- Introduction to interaction concepts in VR/AR systems
- The current view on the future prospects in VR / AR area and role of EON Reality

- Understanding project and project management
- Role and responsibilities of project manager
- Content development team – roles and responsibilities
- Briefing sessions
- Storyboard creation
- Software development management methods
- Scheduling and project planning
- Creation of the project proposal
- Tools supporting project management
- Introduction to SCRUM and Kanban techniques
- Specifics of content development projects in area of VR and AR
- Review of typical CAD and DCC format that can be used in interactive content development
- Export / Import operations using native support in EON Studio
- Export / Import and optimisation of native CAD formats with various software packages
- Good practice when converting geometry
- Use of standardised 3D model file type formats
- Role of external software in data translation
- EON Experience AVR optimization of the models
- Advance EON Raptor techniques while exporting geometries to interactive scenes

## Arbeids- og undervisningsformer

### Organisation and teaching methods

The course is organised as a combination of lectures, practical exercises, weekly hand-ins, self-study and supervision.

Teaching in plenary sessions and individual work/individual assignments.

## Obligatoriske krav som må være godkjent før eksamen kan avlegges

### Course requirements that must be approved before being eligible to sit the examination

- 2-5 individual assignments
- 80% attendance

## Eksamen

## Examination

- 6 hour individual practical and written exam

Graded letter marks are used, from A – F, where E is the lowest pass grade.

The examination can be given in Norwegian.

## Ansvarlig fakultet

Fakultet for audiovisuelle medier og kreativ teknologi

# 2DAVRP21 Development for VR/AR Production

**Emnekode: 2DAVRP21**

**Studiepoeng: 8**

**Semester**

Høst

**Språk**

English

**Krav til forkunnskaper**

Required previous knowledge: 2IAVRP21- Introduction to VR/AR Production

**Læringsutbytte**

**Learning outcome**

On successful completion of the course, the student has acquired the following learning outcome:

**Knowledge**

The student

- has knowledge of full workflow of the interactive content Development
- has knowledge of how to apply existing concepts in 3D interaction design into their applications
- has knowledge of large and small screen projection systems
- has knowledge of how to identify and program use of optical tracking systems in their immersive content
- has knowledge of how to apply and set up various 3D stereoscopic

- projection formats to interactive content
- has knowledge of practically development and testing of their concepts for the application on various immersive systems
- has extensive knowledge of differences and similarities between VR and AR modes
- has knowledge of how to plan and understand the UI/UX specifics for immersive systems
- has knowledge of how to apply various type of multimedia content and embed it into the 3D interactive VR applications
- has knowledge of how to analyze requirements and design features required for specific VR/AR solution
- has knowledge of how to program physics in real time rendering applications

## Skills

The student

- can do review prototypes and their functionality
- can create prototypes for testing
- master to optimise products for specialised content
- can script for basic functionally programming
- can decompile existing projects and prototypes to understand possibilities
- can carry out dynamic routes design
- can analyse and problem solve techniques
- master debugging
- can script in development for immersive systems
- can deploy immersive systems
- can complete prototypes and nodes designed to support interaction in immersive systems
- can use tracking systems
- can set up and use stereoscopic features
- can use various navigation devices for immersive systems
- can set up cluster visualisation systems
- can set up, configure and take use solutions for natural Interfaces
- master the role of physics in interactive applications
- master export of physics features from industry standard 3D-application

## General competence

The student

- can give professional reasons for the decisions made during the development process both in writing and orally.
- can develop and perform extensive testing of prototypes for optimisation

## Innhold

### Contents

- Understanding the process of interactive 3D content development
- User interface of authoring tool for interactive 3D content development
- Installation and configuration various 3D visualisation tools
- Basics of data processing with nodes, prototypes and routing methods in specified interactive 3D content authoring tool
- Overview and analysis of nodes, prototypes as components of VR/AR scene
- Introduction to routes format of programming interactivity
- Programming basic types of interactions via I/O devices
- Setup of visual appearance features
- Examples of mini projects
- Basic physics in the interactive applications
- Complex UI development with 3D, 2D and scripting elements
- Dynamic loading of the assets and streaming
- Design process for prototypes
- Practical use of external data within interactive applications
- Practical use of scripting in advance functionality programming
- Immersive system recognition and specifics
- Use of the gestures in interaction design
- Cluster visualization systems
- Templates for immersive systems and template injection
- Stereoscopy - settings and parameters
- Use of tracking system
- Use of various navigation devices
- Audio and video content in immersive and interactive applications
- UI/UX in various immersive experiences

## Arbeids- og undervisningsformer

### Organisation and teaching methods

The course is organised as a combination of lectures, practical exercises, weekly hand-ins, self-study and supervision.

Teaching in plenary sessions and individual work/individual assignments

## Obligatoriske krav som må være godkjent før eksamen kan

## avlegges

Course requirements that must be approved before being eligible to sit the examination

- 1-3 individual assignments
- 80% attendance

## Eksamen

### Examination

- 6 hour individual practical and written exam

Graded letter marks are used, from A – F, where E is the lowest pass grade.

The examination can be given in Norwegian.

## Ansvarlig fakultet

Fakultet for audiovisuelle medier og kreativ teknologi



# 2CCAVR21 Content Creation for VR/AR

**Emnekode: 2CCAVR21**

**Studiepoeng: 7**

**Semester**

Høst

**Språk**

English

**Krav til forkunnskaper**

Required previous knowledge: 2IAVRP21-Introduction to VR/AR Production og 2DAVRP21-Development for VR/AR Production

**Læringsutbytte**

**Learning outcome**

On successful completion of the course, the student has acquired the following learning outcome:

**Knowledge**

The student

- has knowledge of a 3D model creation processes
- has knowledge of 3D formats and industry standards in 3D modelling software
- has knowledge of how to create complex models that fits the professional criteria of optimized low polygonal model.
- has knowledge of how to create complex models that fits the professional criteria of optimized high polygonal model.
- has knowledge of how to apply skills in improve the visual quality of the models via photographic texture creation.

- has knowledge of types of mapping and optimization techniques for apply the textures into models.
- has knowledge of how to generate and convert the key frame animated 3D models into interactive application formats.
- has knowledge of how to create advanced animations that used boning and rigged structure 3D models.
- has knowledge of how to create advanced animation with focus on quality of character, and other character-driven elements.
- has knowledge of how to rig a 3D-character or 3D-object for different specialised animation types and purposes.

## Skills

The student

- can master the process of 3D model creation following industry standards
- can start and finish 3D-modeling projects from planning face to final textured product
- can finalise 2D and 3D assets for use in interactive applications
- can demonstrate the ability to utilise advanced features and good practice in building models for immersive systems
- can create advanced animation with focus on quality of character, and other character-driven elements.
- can rig a 3D-character or 3D-object for different specialised animation types end purposes
- can utilise animations techniques with focus on use in real time rendering engine

## General competence

The student

- can give professional reasons for the decisions made during the development process both in writing and orally
- can plan, develop and produce content for VR/AR productions based on different criteria.
- can disseminate comprehensive independent work and master the discipline of expression

## Innhold

### Contents

- Understand 3D model creation processes
- Learn industry standard 3D-applications
- Basics and semi-advance low polygonal modelling
- Basics and semi-advance high polygonal modelling
- Texture creation
- UV-mapping
- Practical creation of 2D and 3D assets for use interactive applications creation
- Advance features and good practice in building models for immersive systems
- Key frame animation techniques
- Rigging techniques for different types of models and purpose
- Rigging for AR applications
- Low and high poly model animation
- Animations for real time rendering engines
- Geometry conversion and export Tools
- Conversion geometry to industry standard 3D-application and real time rendering engine
- Different type data transfer between instances of interactive applications

## Arbeids- og undervisningsformer

### Organisation and teaching Methods

The course is organised as a combination of lectures, practical exercises, weekly hand-ins, self-study and supervision.

Teaching in plenary sessions and individual work/individual assignments.

## Obligatoriske krav som må være godkjent før eksamen kan avlegges

Course requirements that must be approved before being eligible to sit the examination

- 2-4 individual assignments
- 80% attendance

## Eksamen

### Examination

- 6 hour individual practical and written exam

Graded letter marks are used, from A – F, where E is the lowest pass grade.

The examination can be given in Norwegian.

## **Ansvarlig fakultet**

Fakultet for audiovisuelle medier og kreativ teknologi

# 2AVRMP21 VR/AR on Mobile Platforms

Emnekode: 2AVRMP21

Studiepoeng: 5

Semester

Høst

Språk

English

**Krav til forkunnskaper**

Recommended previous knowledge: 2IAVRP21-Introduction to VR/AR Production, 2DAVRP21-Development to VR/AR Production and 2CCA VR21-Content Creation for VR/AR

**Læringsutbytte**

**Learning outcome**

On successful completion of the course, the student has acquired the following learning outcome:

**Knowledge**

The student

- has knowledge of technical specifications requirements for development for available mobile platforms
- has knowledge of Augmented Reality solutions available for mobile platforms and practically test them
- has knowledge of how to analyze and apply various type of mobile interaction

techniques focused on VR and AR experiences

- has knowledge of the mobile development process with tools like Android SDK, and iOS SDK
- has knowledge of how to develop and deploy applications for mobile devices based on 2 most popular mobile operating systems
- has knowledge of how to identify and adjust a mobile application requirements
- has knowledge of how to utilize the head mounted display (HMD) for developing interactive applications for various disciplines incl. commercial and educational purposes

## Skills

The student

- can develop applications for different mobile platforms
- can script, program and debug applications for mobile platforms
- can develop applications specialised for certain platforms based on their limitations and abilities.

## General competence

The student

- master to give professional reasons for the decisions made during the development process both in writing and orally
- can exploit mobile platforms and peripherals to create VR and AR applications suitable for a range of different purposes, including education, simulation and entertainment.
- can disseminate comprehensive independent and team work and master the discipline of expression

## Innhold

### Contents

- Installation and understanding of different mobile platform's SDK
- Basics of Android Studio and Xcode for two most popular mobile platforms development
- Use nodes and prototypes optimized for mobile solutions
- Build interaction and UI based functionality for mobile
- Deploy final application on release platform

- Review of typical use of AR in industry to educational, commercial and “edutainment” type applications
- Review of most popular AR engines that can be used in development the functionality on mobile platforms
- Creation and configuration of developer profile for AR applications
- Scripting, programming and debugging applications for mobile platform
- Role of VR mode in the process of mobile application development
- Understand different types of mobile devices and their limitations
- Elements of interactions that are available for Mobile VR platform
- Predefined rendering functions and setup for VR stereo / mono mode
- Head Mounted Display systems available for mobile platforms - review and development

## Arbeids- og undervisningsformer

### Organisation and teaching Methods

The course is organised as a combination of lectures, practical exercises, weekly hand-ins, self-study and supervision.

Teaching in plenary sessions and individual work/individual assignments.

## Obligatoriske krav som må være godkjent før eksamen kan avlegges

### Course requirements that must be approved before being eligible to sit the examination

- 2-4 individual assignments
- 80% attendance

## Eksamen

### Examination

- 6 hour individual practical and written exam

Graded letter marks are used, from A – F, where E is the lowest pass grade.

The examination can be given in Norwegian.

## Ansvarlig fakultet

Fakultet for audiovisuelle medier og kreativ teknologi



# 2PASAVR21 Programming and scripting for VR/AR systems

Emnekode: 2PASAVR21

Studiepoeng: 5

Semester

Høst

Språk

English

Krav til forkunnskaper

None

Læringsutbytte

Learning outcomes:

On successful completion of the course, the student has acquired the following learning outcome:

**Knowledge**

The student

- has knowledge of the role and advantages that comes from use of the programming and algorithmic thinking
- has knowledge of how to write and apply programming codes within basic and advanced applications that is based on human computer interactions
- has knowledge of how to recognize and practically apply various programming concept and good commercial practices while developing the code
- has knowledge of how to apply practically the scripting within 3D interactive

content

- has knowledge of how to understand the role of computer graphic pipeline and optimizations required
- has knowledge of practically reuse and adjust functionality of the existing code for own bespoke applications
- has advanced knowledge of how to develop prototypes of interactive functionalities
- has knowledge of the development process required while developing new functionalities of the core authoring software
- has knowledge of, understand and analyze the usability of database systems in modern interactive 3D content
- has solid knowledge of how to integrate the 3D interactive VR/AR experiences in third-party software IDE - Interactive Development Environments

## Skills

The student

- can master to give professional reasons for the decisions made during the development process both in writing and orally
- can program for mobile platforms and peripherals to create VR and AR applications
- can disseminate comprehensive independent and team work and master the discipline of Expression

## General competence

The student

- can give professional reasons for the decisions made during the development process both in writing and orally
- can take part in professional discussions regarding reasoning and structure of programming solutions for Virtual Reality and Augmented Reality applications for mobile platforms.

## Innhold

Course content:

- Concepts of scripting and programming With JavaScript
- Data types, operations and functions review in JavaScript with practical application in daily programming activities

- Object oriented programming within interactive 3D application
- Review and practical application of existing objects, methods and functions with VR/AR programming software
- Programming of photorealistic materials
- Shader development for mobile applications
- Use of programming language for development of new nodes / functionality
- Optimisation techniques for node programming
- JavaScript and HTML with EON software application communication
- Basic programming of communication between interactive content and database systems - MySQL

## Arbeids- og undervisningsformer

Teaching and working Methods:

The course is organised as a combination of lectures, practical exercises, weekly hand-ins, self-study and supervision.

Teaching in plenary sessions and individual work/individual assignments

## Obligatoriske krav som må være godkjent før eksamen kan avlegges

Coursework requirements:

- 2-5 individual assignments
- 80 % attendance

## Eksamen

Examination:

- 6 hour individual practical and written exam

Graded letter marks are used, from A – F, where E is the lowest pass grade.

The examination can be given in Norwegian.

## Ansvarlig fakultet

Fakultet for audiovisuelle medier og kreativ teknologi

# 2AVRPP31 VR/AR Professional Practice

**Emnekode: 2AVRPP31**

**Studiepoeng: 30**

## **Semester**

Vår

## **Språk**

English

## **Krav til forkunnskaper**

Recommended previous knowledge: 2IAVRP221-Introduction to VR/AR Production, 2DAVRP21-Development to VR/AR Production, 2CCAVR21-Content Creation for VR/AR and 2AVRMP21- VR/AR on Mobile Platforms

## **Læringsutbytte**

### **Learning outcome**

On successful completion of the course, the student has acquired the following learning outcome:

### **Knowledge**

The student

- has knowledge of how to work with development of VR/AR applications in real industry environment
- has knowledge of industry standards in VR/AR development
- has specialized knowledge of Virtual Reality and Augmented Reality
- has advanced knowledge of production pipelines in a corporate setting
- has specialised knowledge of the production of content for VR and AR productions
- has in depth knowledge of critical thinking, communication and problem solution

- linked to content development
- knows of national and international research and development work that is relevant for VR and AR development.

## Skills

The student

- can master and apply relevant professional tools, methods and theory for VR and AR content creation
- master design processes from idea to end product, both independently and in team
- can apply professional knowledge and relevant results from research and development work underlying VR and AR productions
- can reflect on his/her own professional performance and adjust it under supervision
- can find, assess, use and refer to relevant research and development work, artistic and technical development work and other pertinent professional material
- master critical thinking, logic, communication and problem solution

## General competence

The student

- can analyse, plan and carry out varied work tasks and projects over a protracted time period, alone and as a group participant, and in accordance with ethical requirements and guidelines
- has insight into relevant professional and work ethical issues, and is able to contribute to a professional community
- can inspire and facilitate entrepreneurship, new thinking and innovation and to involve local working, social and cultural life
- can disseminate central subject matter orally and in writing, to take part in professional discussions within the subject area and share his/her knowledge and experiences with others
- can use knowledge and skills within content development in new areas
- can give professional reasons for the decisions made during the development process both in writing and orally
- can take part in professional discussions regarding the of VR/AR development following industry standards and development tools

## Innhold

### Contents

- Gain work experience in a real VR/AR production pipeline, using industry standard tools and development processes.
- Gain experience working with real customers in a professional working environment for VR/AR application development
- Project management
- Professional workflows
- Idea promotion
- Marketing
- Installation support
- Team work
- Communication and development
- Entrepreneurship / incubator
- Concept of Edutainment
- Concept of Education
- Concept of Industry

## Arbeids- og undervisningsformer

### Organisation and teaching methods

The course is organised as a combination of lectures, practical exercises, weekly hand-ins, self-study and supervision.

The course duration is one semester from January to June.

Teaching in plenary sessions and individual work/individual assignments.

## Obligatoriske krav som må være godkjent før eksamen kan avlegges

### Course requirements that must be approved before being eligible to sit the examination

- 2-6 group or individual supervised assignments
- attendance to mentoring sessions
- 80% attendance

## Eksamen

### Examination

- Portfolio consisting of 1-3 assignments individually assessed. Oral individual exam with grade adjustment possibility.

The examination can be given in Norwegian.

Graded letter marks are used, from A – F, where E is the lowest pass grade.

*Due to the corona pandemic there are changes in the exam in spring semester 2021. The new exam is as follows:*

- *Portfolio consisting of 1-3 assignments individually assessed. Oral individual exam with grade adjustment possibility. Oral exam will be digital.*

## Ansvarlig fakultet

Fakultet for audiovisuelle medier og kreativ teknologi