PROGRAMME APPENDIX TO THE TEACHING AND EXAMINATION REGULATIONS OF THE BACHELOR'S PROGRAMME CREATIVE TECHNOLOGY

The regulations in this appendix form an integral part of the teaching and examination regulations of the bachelor's programme Creative Technology of the Faculty of Electrical Engineering, Mathematics and Computer Science of the University of Twente.

UNIVERSITEIT TWENTE.

CONTENTS

INTRODUCTION

In this document the programme specific section (annex) of the Teaching and Examination Regulations for the Bachelor's programme Creative Technology (BSc) is described.

In Paragraph 1 of this annex the degree programme has been described in accordance with Article 7.13 of the Higher Education and Research Act, as referred to in the General Teaching and Examination Regulations, Article 3.2.3.

In Paragraph 2 of this annex the other programme specific characteristics have been described.

In addition, the transitional arrangements are described in a separate section (annex). These transitional arrangements apply only to students who were already enrolled for the Bachelor's programme Creative before September 1, 2013 and had education in the preTOM situation (the situation prior to the introduction of the Twente Education Model (Dutch: Twents Onderwijs Model or TOM).

The General Teaching and Examination Regulations together with this programme specific section (annex) and the section (annex) on transitional arrangements form the applicable Teaching and Examination Regulations for the Bachelor's programme Creative Technology (BSc) as stated in the General Teaching and Examination Regulations, Article 1.1.4.

PARAGRAPH 1
THE PROGRAMME SPECIFIC ISSUES OF ARTICLES 3.1 AND 3.2. (WHW 7.13.2) OF THE REGULATIONS[1]

Art 1.1 - PROGRAMME CONTENTS AND EXAMINATIONS (A)

1. Students who were already enrolled for the Bachelor's programme Creative before September 1, 2013 and had education in the preTOM situation (the situation prior to the introduction of the Twente Education Model (Dutch: Twents Onderwijs Model or TOM) can find their programme contents, examinations and transitional arrangements in the transitional arrangements appendix to the teaching and examination regulations of the bachelor's programme Creative Technology.

2. Students who are enrolled for their first year in Creative Technology on or after September 1, 2013, pass the bachelor's examination by completing the units of study of tables 1 through 12 of this article.

3. At the end of the first year students who were first enrolled on or after September 1, 2013, must choose between two options for module 5 in their second year: Smart Technology (module 5a, outlined in Table 5a) or New Media (module 5b, outlined in Table 5b).

4. The first semester of the third year programme is in principle scheduled for the minor programme, a 30EC free space programme. At the end of the second year students who were first enrolled on or after September 1, 2013, must choose modules for their *minor*. Students can take:

   - pre-Master modules or courses to prepare for further study in a Master's programme,

   - one or more High Tech, Human Touch (HTHT) modules or one of the other following general minor options: The Educative minor ("leren lesgeven" in Dutch only), the Crossing Borders minor, or the Board minor (in Dutch only),

   - one semester of courses at another (foreign) university,

   - one or more "deepening" modules, one of those can be the alternative module of their first module in the second year.

   - one or more "broadening" modules (Join-in modules), modules which belong to other UT Bachelor's programmes.

   - and possibly more, with due observation of the provisions of article 1.9 of this appendix.

5. The student's choice of modules in their minor space (see article 1.1.4 above) must meet the requirements of article 1.9 of this programme appendix.

6. To pass their degree students complete a Graduation Project.

   a. Students who were first enrolled on or after September 1, 2013 complete their Graduation Project in two parts. The first part is contained in the Real

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[1] The regulations are: the teaching and examination regulations for Creative Technology. The letters (a-e, i, l, s, t, v) in the article titles of this paragraph refer to the corresponding items in WHW 7.13.2 and as mentioned in article 3.2.3 of the general teaching and examination regulations.

World Perspective module (module 11), the second part in the We Create Impact module (module 12). The combined study load of the two parts of the Graduation Project is 17 EC.

b. The Graduation Project consists of

1. a design project, where context and goals are set preferably by an external party.

2. a thesis, with appendices when necessary, in which the student renders account of the graduation project. The thesis includes a description of the design approach, state of the art research, surveys and experiments conducted during the project, as well as a description of prototypes and other deliverables which result from the project.

3. an abstract of the Graduation Project report included in the thesis, and.

4. a public presentation and defence of the graduation work.

c. The Real World Perspective module and the We CreaTe Impact module are taught each semester; the Real World Perspective module in blocks 1A and 2A and the We CreaTe Impact module in blocks 1B and 2B. Students must complete successfully the Real World Perspective before starting the We Create Impact module.

7. Tables 1 through 12 describe the content of the curriculum in the form of module descriptions.

a. There are no module parts within the modules mentioned in tables 1 through 8, 11 and 12 allowed for separate assessment.

b. These module descriptions are based on the data of the previous academic year. These descriptions reflect the curriculum of the current academic year to the best of the programme's board knowledge but are not binding. They may be subject to minor changes based on e.g. the evaluation results of modules in the fourth quartile which still takes place during the composition of these teaching and examination regulations.

c. The programme board in close cooperation with the programme committee will guarantee the correct completion and publication of the module descriptions no later than 2 weeks prior to the start of a respective module in accordance with the requirements specified in Article 4.4.2 of the general teaching and examination regulations.

Table 1: module 1 (We Create Identity)

Module 1	We Create Identity
Modulecode	201700132
EC	15
Assessment Type	ADOPRW[2]
Language of Instruction and Testing	English
Module part	**EC**
Interactive Video Project	3.0
Programming	2.5
Introduction to Computer Science	2.5
Visual Communication	2.5
Webtechnology	1.0
Mathematics	1.5
Academic Skills	1.0
Professional Development	1.0

Learning goals:

In this module, the students will learn:

- to describe various aspects typical for the field of Creative Technology (example products, societal context, processes and issues in the field, techniques for creative thinking)

- to a certain extent, to describe their own position in this field ("Me as a Creative Technologist")

- to work in a project (first encounter with planning, collaboration, communication and organisation)

- to describe, and apply to themselves, possible roles that one can take in a project or creative development process

- to apply a first set of skills and insights in the various thematic subfields underlying the curriculum (Smart Technology, New Media, Computer Science and Engineering, (Visual) Storytelling, Programming)

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[2] Assessment types are explained in article 1.8.1 of this appendix.

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Table 2: module 2 (Smart Environments)

Module 2	Smart Environments
Modulecode	201700041
EC	15
Assessment Type	ADOPRW[3]
Language of Instruction and Testing	English
Module part	**EC**
Project Creative Applications 2	3.0
Introduction to Engineering*	4.0
Ubiquitous Computing**	4.0
Sketching	3.0
Professional Development	1.0

* Cluster consisting of the topics: Introduction to Mathematics and Modelling (65%) and Engineering our Digital Future (35%)

** Cluster consisting of the topics: Programming and Physical Computing (66%) and Smart Environments Lectures (34%)

Learning goals:

In this module, the student will learn:

- Design and realize interactive programs for both screen-oriented and embedded applications

- Use theory about smart environments to build parts of working distributed applications

- Use theory about sending and modeling information and digital signal processing to build working applications.

- Use theory about embedded systems to build working applications and systems

- Understand mathematical concepts for modeling systems and use these to design and realize creative applications

- Apply the principles perspective and 3D for sketching in the design process

- Realize project objectives in a team and reflect on their own role in a team

- Present (partial) results of a project, both orally and on paper

- Manage a project in a structured and transferable manner

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[3] Assessment types are explained in article 1.8.1 of this appendix.

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Table 3: module 3 (Living and Working Tomorrow)

Module 3	Living and Working Tomorrow
Modulecode	201600231
EC	15
Assessment Type	ADOPRW[4]
Language of Instruction and Testing	English
Module part	**EC**
Living and Working Project	5.0
Designing in Context	3.0
Introduction to Physical Systems	3.0
Math and Modelling	2.0
Interactive Visualisation	1.0
Professional Development	1.0

Learning goals:

The goals of this module are:

1.   Generate ideas in a structured fashion, describe methods for ideation and experience and use these methods in practice
2.   Work on a project in a rapid design cycle (iterative, weekly increments, SCRUM like methods). Selecting from various realization forms of ideas and motivate choices (proto, scenario, storyboard, film, mockup, measurement setup, model, simulation, 3D visualization). Evaluate design and design choices (critical attitude, insight, self reflection)
3.   Deal with external clients, an introduction in communication, setting goals and visualization
4.   Documentation and evaluation. Write pitches, presentations, proposals, keep a lab journal, perform peer reviews, write and evaluate reports, write summaries.
5.   Practical skills in design: work with shape, foam models, finishing
6.   Practical skills in 3D visualization (maya, blender, unity): canvas, rendering, shaders, animation
7.   Practical experimental skills (electronic domain): breadboarding, measurement setup (scope, function generator), journalizing, network analysis, elementary filtering
8.   Modeling and simulation. Recognize and explain first and second order behaviour in the electrical and mechanical domain. Create and execute simulations in 20sim
9.   Mathematical description of first and second order systems, work with - and solve - differential equations, both analytically and using numerical (euler) methods
10. Development as independent creative designer (portfolio, challenges, CMS, presentation)

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[4] Assessment types are explained in article 1.8.1 of this appendix.

Table 4: module 4 (Art, Impact and Technology)

Module 4	Art, Impact and Technology
Modulecode	201600232
EC	15
Assessment Type	ADOPRW[5]
Language of Instruction and Testing	English
Module part	**EC**
Have Fun and Play	5.0
Human Factors	3.0
Statistics	3.0
Algorithms in Creative Technology	3.0
Professional Development	1.0

Learning goals:

After passing this module, students are able:
1. to conceptualize an installation using creative thinking techniques
2. to develop an interactive installation

- to design the installation using techniques from new media, gaming, sensor systems
- to plan, devise roles and subtasks
- to use appropriate system engineering methods
- to realize the installation using techniques from new media, gaming, sensor systems.

3. to program applications

- to determine an algorithm for a given problem
- to combine algorithms as building blocks that solve a larger problem
- to explain a solution and the role of the algorithms it employs
- to explain an algorithm (program) and its application domain
- to describe the structure of a solution in pseudo code
- to translate pseudocode to a running program
- to construct a program stepwise and to validate the functionality of each step
- to debug a program and to document their programs properly

4. to take human factors into account during developments of interactive products

- to make a relevant List of Requirements from a user and usability perspective.
- to develop interactive products while applying a process which is characterized by iterative steps between prototyping and (intermediate) usability evaluations
- to collect and apply knowledge on Human Factors guidelines and techniques for designing interactive products
- to apply appropriate evaluation methods to test usability of interactive products.

5. to calculate and interpret research and/or test data

- to apply basic rules of probability and methods of statistics, relevant for the practice of

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[5] Assessment types are explained in article 1.8.1 of this appendix.

a Creative Technology professional,
- being able to give a correct interpretation of his computations or the result of the SPSS program.

6. to present the project concept, design, realization

- to use appropriate visual and textual means
- to tell the story behind the (creation of) their installation

7. to reflect on the artistic value of the installation

- To signify the impact and importance of the realized installation.
- to place their work in a historic and artistic context
- to motivate their (technical as well as artistic) design choices.

Table 5A: module 5A (Smart Technology)[6]

Module 5A[7]	Smart Technology
Modulecode	201700017
EC	15
Assessment Type	ADOPRW[8]
Language of Instruction and Testing	English
Module part	**EC**
Circuits & Electronics and Signals	4.5
Sensors	3.5
Analysis and Control of Systems	4.5
Literature Research Project	2.0
Professional Development	0.5

Learning goals:

In this module, the student will learn:

1) [Circuits &Electronics + Systems and Signals]
to characterise and analyse electric circuits regarding 1st and 2nd order systems in both time (step responses) and frequency (filters) domain with the aid of various signal descriptions, complex number theory, differential equations and LTI system descriptions; Implement, characterise and analyse electronic implementations of these systems

2) [Sensors] to characterise and analyse in both theory and practice resistive, capacitive, magnetic, acoustic and optical sensors and their interface circuitry

3) [Control Systems + Systems and Signals] to model and analyse dynamical systems using various methods and representations in both analog and digital implementations with the aid of Laplace transformation and block diagrams; to characterise, analyse and implement feedback control (PID) in digital and analog domain and understand the mathematical representations.

4) [literature research project] to do a scientific literature review based on a personal fascination in the Smart Technology context in order to obtain the scientific insight needed to produce new ideas, services or products.

5) [Professional Development] to work independently on the showcase portfolio web site, using skills obtained in the rest of the module; to write an individual reflection essay at the end of the module.

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[6] The regulation regarding admission to units of study in the tables 5 through 8 is in Art. 1.9.3 of this appendix.

[7] There is no specific prerequisite requirement regarding the choice between the New Media or the Smart Technology module.

[8] Assessment types are explained in article 1.8.1 of this appendix.

Table 5B: module 5B (New Media)[9]

Module 5B[10]	New Media
Modulecode	201700016
EC	15
Assessment Type	ADOPRW[11]
Language of Instruction and Testing	English
Module part	**EC**
3D Graphics & Animation Project	4.5
Game Development & VR	4.0
Sound Engineering	2.0
Mathematics for New Media	2.0
Literature Research Project	2.0
Professional Development	0.5

Learning goals:

In this module, the student will learn:

- Experience with creating larger scale New Media products.
- Basic theory, skills, and working knowledge of tools, for Sound Engineering.
- Basic knowledge and skills for Computer Animation.
- Skills for creating 3D graphics objects and animated characters.
- Insight in state of the art Virtual Reality and Augmented Reality techniques.
- Understanding of basic principles of Game Design.
- Being able to create and implement simple games using game engines like Unity3D.
- Have a working knowledge of mathematical principles for New Media.
- Understand how to explore literature, and how scientific research methods work.
- Practice with techniques for creating multimodal products and applications.

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[9] The regulation regarding admission to units of study in the tables 5 through 8 is in Art. 1.9.3 of this appendix.

[10] There is no specific prerequisite requirement regarding the choice between the New Media or the Smart Technology module.

[11] Assessment types are explained in article 1.8.1 of this appendix.

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Table 6: module 6 (Intelligent Interaction Design)[12]

Module 6	Intelligent Interaction Design
Modulecode	201700131
EC	15
Assessment Type	ADOPRW[13]
Language of Instruction and Testing	English
Module part	**EC**
HCI Project	4.0
Artificial Intelligence (theory)	2.0
Programming	3.0
HCI Design and Evaluation	2.5
Statistical Techniques	3.0
Professional Development	0.5

Learning goals:

After this module, the student can:

- design, develop and evaluate low fidelity and high fidelity prototypes of an intelligent interactive system that is well justified in context.
- take real users into account in the analysis, design, and evaluation of interactive systems with respect to both usability and user experience.
- formulate a research question and answer it by choosing and applying various research methods, collecting data, analysing the data using the appropriate statistical or other methods, and drawing conclusions from this.
- explain and apply the main AI-techniques concerning search, Bayesian networks and machine learning.
- work with data structures and implement algorithms in an object oriented programming language (either Java/Processing or C++/OpenFrameworks).

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[12] The regulation regarding admission to units of study in the tables 5 through 8 is in Art. 1.9.3 of this appendix.

[13] Assessment types are explained in article 1.8.1 of this appendix.

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Table 7: module 7 (Innovation and Entrepreneurship)[14]

Module 7	Innovation and Entrepreneurship
Modulecode	201600233
EC	15
Assessment Type	ADOPRW[15]
Language of Instruction and Testing	English
Module part	**EC**
Innovation and Entrepreneurship Practice	4.0
Innovation and Entrepreneurship Theory	3.5
Thinking Strategically	3.0
Acting Responsibly	4.0
Professional Development	0.5

Learning goals:

In this module, the students:
1. have become aware of business dynamics and knowledge required to deal with it in a firm;
2. Have gained understanding of alternative ways of earning a living in their future career;
3. Have gained proficiency of business jargon that helps them communicate effectively with business experts;
4. Have knowledge of the most pivotal models for analysing and developing the commercialisation of an inventive (technical) idea.
5. Have learned how to apply concepts and models in discussing and writing their business plan;
6. Have improved their team work abilities
7. Have awareness of the way venture stakeholders perceive inventive ideas and business plans;
8. Have the ability to critically assess the feasibility of their business concept;
9. understand basic ethical theory, critical reasoning and professional responsibility, and on this basis are able to clarify how technologies may positively or negatively affect user behaviour and quality of life;
10. can draw inspiration from theoretical resources, and use for the design/prototype of a technological product;
11. can engage in unbiased and critical discussion of the ethical implications of technological innovation;
12. understand the basic mathematical foundations of game theory;
13. can apply game theory in the context of auctions as an economic platform to make business.

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[14] The regulation regarding admission to units of study in the tables 5 through 8 is in Art. 1.9.3 of this appendix.

[15] Assessment types are explained in article 1.8.1 of this appendix.

Table 8: module 8 (Data: from the Source to the Senses (DSS))[16]

Module 8	Data: from the Source to the Senses
Modulecode	201600234
EC	15
Assessment Type	ADOPRW[17]
Language of Instruction and Testing	English
Module part	**EC**
Hybrid Worlds project	4.5
Internet Technology	2.5
Data Driven Applications	2.5
Data Visualisation	2.5
Biosignals and Medical Electronics (ST)*	2.5
Animated Data Narration (NM)*	2.5
Professional Development	0.5

* This is a "1 out of 2" component. Students choose either Biosignals and Medical Electronics or Animated Data Narration.

Learning goals:

[Hybrid Worlds] After completion of the project, the students:
• Can construct a working installation that features physical visualization of data, integrating course content from the module;
• Can use the design process of Creative Technology to organize their work and document process and installation;
• Are able to give and receive constructive feedback for improvement of their work.
• (Organisation) The students understand the design process of Creative Technology and use this to plan and organize their project.
• (Documentation) Students can document the project goal, the design process, the planning, the installation and their individual contributions to the project in a complete and structured way.
• (Feedback) Students can improve their installation and documentation by using feedback from supervisors and other students;
• (Feedback) Students can give critical and constructive feedback to other project groups.

[Data Driven Applications] Students can:
• understand the fundamental characteristics, benefits and disadvantages of data and the need to manage data.
• can create models for data with a low to medium complexity.

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[16] The regulation regarding admission to units of study in the tables 5 through 8 is in Art. 1.9.3 of this appendix.

[17] Assessment types are explained in article 1.8.1 of this appendix.

- can formulate SQL queries to retrieve and manipulate data.
- can use SQL in an web application programming language.
- can create webservices that store and retrieve data from databases
- can prepare a dataset for visualization

[Data Visualisation] Students can:
- apply and discuss a broad range of concepts and principles related to representing data visually and/or physically.
- critically analyze data visualizations and 'physicalizations' of information, regarding a range of aspects, and suggest improvements / design alternatives.
- develop creative and useful conceptual solutions for data visualization/physicalization problems.
- successfully create data visualizations with several different tools.

[Internet Technology] Students can:
- Understand the basic principles of layered network architectures, with application to the internet.
- Understand the principles of application-level protocols (such as DNS, SMTP and HTTP) as well as multi-media (streaming) protocols.
- Understand the basic principles of transport protocols like TCP and UDP.
- Understand the basis of routing and addressing in the internet (IP).
- Understand the basic principles of media access control and addressing at the data-link layer, for both wired and wireless networks.

[Smart Technology (1 out of 2 option)] Students:
- understand the nature and properties of signals and noise (sources) in electrophysiological measurement environments
- can determine the demands of and develop measurement amplifiers (using OpAmps), subsequent signal conditioning and data analysis needed to obtain proper electrophysiological measurements.
- have insight into some of the primary ethical and safety issues regarding electrophysiological measurements on humans.
- have insight into visualization demands of electrophysiological data for clinical usage and experts in the medical field.

[New Media deepening (1 out of 2 option)] Students:
- set up various forms of information graphics, using a small selection of well-known data visualization tools.
- apply data visualization in a story-telling context.
- use *gamification* to make interactive visualization applications, based on 2D or 3D modeling and scripting for interaction.

[Professional Development] Students are able
- to work independently on the showcase portfolio web site, using skills obtained in the rest of the module;
- to write an individual reflection essay at the end of the module.

Table 9: module 9 (…)[18]

Module 9	… A module / (exchange) courses in first half of the minor programme
Module code*	Unknown, check respective modules or courses
EC	15 (15EC have been allocated to the first half of the minor)
Assessment Type	Unknown, check respective modules or courses
Language of Instruction and Testing	Unknown, check respective modules or courses; most likely English if a minor is taken at the UT.

Table 10: module 10 (…)[18]

Module 10	… A module / (exchange) courses in 2nd half of the minor programme
Module code*	Unknown, check respective modules or courses
EC	15 (15EC have been allocated to the 2nd half of the minor)
Assessment Type	Unknown, check respective modules or courses
Language of Instruction and Testing	Unknown, check respective modules or courses; most likely English if a minor is taken at the UT.

* The module code will depend on the individual choice of the student. If the student chooses a module at the UT, then the respective code should be filled in here. If the student chooses separate courses (i.e. parts of modules such as in some premasters, loose courses at the UT such as in some premasters or courses outside the UT), then all those individual courses will have a unique code.

The range of modules available at the University of Twente for the minor programme can be found in Article 1.1.4; more information on modules for the minor programme is available at the university's Major-minor website[19].

The conditions that the choices within the minor programme should adhere to, can be found in Article 1.9.4 of this annex.

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[18] The regulation regarding admission to units of study in the tables 9 and 10 is in Art. 1.9.4 of this appendix.

[19] http://www.utwente.nl/en/education/electives/minor/

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Table 11: module 11 (Real World Perspective)[20]

Module 11[21]	Real World Perspective
Modulecode	201600364 / 201600049
EC	15
Assessment Type	ADOPRW[22]
Language of Instruction and Testing	English
Module part	**EC**
Graduation Project 1	4.0
Academic Writing	3.0
Reflection 1	3.0
Design of Persuasive Health Technology*	5.0
Documentary Practice*	5.0
Remote Care Nearby*	5.0
Academic Skills	1.0
Professional Development	1.0

* These three courses are real world challenges. They are a "1 out of 3" component. Students choose one of these three courses.

Learning goals:
At the end of the module "Real World Perspective" students should be able to:
1) elicit (stakeholder) information to describe the problem statement of a design project,
2) apply academic principles (i.e., searching for literature, writing a review) to State of the Art research,
3) define research questions based on State of the Art research and additional design context exploration,
4) apply knowledge and skills acquired during the Creative Technology programme in an integrated manner,
5) autonomously develop and refine new knowledge and new skills,
6) work independently and systematically on a large design project,
7) transfer knowledge in a domain specific environment using appropriate communication modalities,
8) reflect from an external perspective (e.g. ethical, societal, environmental, economic) on the potential outcome of their work (e.g. Graduation Project) in a verbal, textual and (optional) visual manner.

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[20] The regulation regarding admission to units of study in the tables 11 and 12 is in Art. 1.9.5 of this appendix.

[21] The "Real World Perspective" module (module 11) is taught in the first half of each semester (blocks 1A and 2A). Students cannot take the Real World Perspective module after the We CreaTe Impact module. Students must take the Real World Perspective module and the We CreaTe Impact module consecutively in the same semester.
[22] Assessment types are explained in article 1.8.1 of this appendix.

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In addition, at the end of a Real World Challenge students should be able to:
Design of Persuasive Health Technology: students are able to apply psychological theories and principles of entertainment education to design interactive persuasive technology for health promotion and care.
Documentary Practice: students are able to visually reflect on the potential outcome of their work (e.g. Graduation Project) by means of a documentary.
Remote Care Nearby: students are able to design a telemedicine service concept that improves quality of care, lowers the pressure on care providing professionals, improves the patient's quality of life and supports intramural and extra mural care settings.

Table 12: module 12 (We create Impact)[23]

Module 12[24]	We create Impact
Modulecode	201600050
EC	15
Assessment Type	ADOPRW[25]
Language of Instruction and Testing	English
Module part	**EC**
Graduation Project 2	13.0
Reflection 2	2.0

Learning goals:
At the end of the Graduation Semester students are able to:
• define research questions after design context exploration
• apply knowledge and skills acquired during the Creative Technology programme in an integrated manner
• autonomously develop and refine new knowledge and skills
• work independently and systematically and communicate appropriately
• reflect on designed concept/product and design process
• offer added value to a client
• identify a series of ethical and societal aspects of their design projects and reflect critically on it
• write a project report that describes the graduation work on an academic bachelor level
• summarize graduation work in a concise way
• publically present and defend graduation work

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[23] The regulation regarding admission to units of study in the tables 11 and 12 is in Art. 1.9.5 of this appendix.

[24] The "We create Impact" module (module 12) is taught in the second half of each semester (blocks 1B and 2B). Students cannot take the Real World Perspective module after the We CreaTe Impact module. Students must take the Real World Perspective module and the We CreaTe Impact module consecutively in the same semester.

[25] Assessment types are explained in article 1.8.1 of this appendix.

Art 1.2 - CONTENTS OF EXAMINATION SPECIALIZATIONS (B)

There are no graduation track specializations within the Creative Technology programme.

Art 1.3 - INTENDED LEARNING OUTCOMES (C)

Graduates of this programme are problem-solvers, who
- can trace back (or help a client trace back) a possibly ill-posed initial question to the underlying challenge,
- can generate ideas and concepts,
- can identify opportunities for the exploitation of new technologies, and
- can develop ideas and concepts into key prototypes.

To this end, they acquire skills and knowledge in five areas:
(1) Controlling the process of creation by a designer;
(2) Understanding and use of technology;
(3) Designing for interaction, expression, impact and experience;
(4) Societal and economic value; and
(5) Academic and professional skills.

The intended learning outcomes in area (1) Self-managing a process of creation, are:

1. Graduates understand autonomous design, and have the skills and knowledge to act as an autonomous designer, so

   a. they can identify and choose projects,

   b. they can explain and justify ideas in context,

   c. they have developed personality and a personal style.

2. Graduates understand and are skilled in creative thinking and creative acting, so

   a. they know and can apply creative thinking techniques,

   b. they know and can apply divergent and convergent thinking,

   c. they know and can apply tinkering.

3. Graduates understand and have the knowledge to employ multidisciplinary design methods, so

   a. they understand and can apply phasing in the systematic design process

   b. they understand and can apply demand driven and explorative design,

   c. they can design in a team, and invoke help of experts

   d. they have the knowledge and skills to document and report,

   e. they have the knowledge and skills to incorporate the user in the design process,

   f. they have the knowledge and skills to evaluate design options and take design decisions

The intended learning outcomes in the area (2) Understanding and use of technology are:

4. Graduates understand and can use technology in the following domains:

   a. programming, algorithms, frameworks & protocols

   b. web technology, web services and data management,

   c. dynamic behaviour of physical systems, (especially in the electrical domain)

   d. physical computing, sensing, physical (user) interaction

   e. (Internet) network technology and protocols

5. Graduates can rely on a basic knowledge of physics, mathematics and engineering in support of their understanding and use of technology.

The intended learning outcomes in the area (3) Designing for interaction, expression, impact and experience are:

6. The graduates understand and can use expressive technology, so

   a. they have knowledge and skills in expressive media, like still and moving images, sound and 3d-modelling,

   b. they have knowledge and skills in storytelling, story worlds, and messaging.

7. The graduates

   a. have knowledge of and can investigate human technology relationship and human design relationship,

   b. are familiar with arts and culture,

   c. are aware of human factors, and of social patterns and societal structures.

The intended learning outcomes in the area (4) Societal and economic value are:

8. The graduates have knowledge and skills to bring creative technology to the market, so

   a. they have the knowledge to perform a market analysis

   b. they are familiar with attracting capital and financing,

   c. they understand intellectual property rights

   e. they can write a business plan.

9. Graduates are aware of the roles of designers in society, and the standards (ethically and legally) for professional behavior.

The intended learning outcomes in the area (5) Academic and professional skills are:

10. Graduates can communicate with experts and non-experts about all aspects of their field, this communication covers

    a. presentation,

    b. justification

    c. documentation,

    d. scientific debate;

in this communication the graduate knows how to employ modern media.

11. Graduates are

   a. capable of logical reasoning;

   b. inquisitive and capable of posing proper questions;

   c. they have knowledge of research methods,

   d. they can set up their own research;

   e. they can critically evaluate results obtained (by themselves and others);

   f. they can work in a team

   g. they are capable of critical reflection and can adapt their behavior on the basis of that reflection

   h. they are aware of gaps in their own knowledge and skills;

   i. they are prepared to learn and capable of learning.

Art 1.4 -   PRACTICAL WORK AND PRACTICAL EXERCISES (D)

There are no special provisions for practical work and exercises.

Art 1.5 -   STUDY LOAD OF THE PROGRAMME AND ITS UNITS (E)

The study load of units of study is in the tables of article 1.1 of this appendix. The study load of the entire programme is 180 EC.

Art 1.6 -   THE FULL- /PART-TIME STATUS (I)

The programme enrols only students with a full-time status.

Art 1.7 -   PERIOD OF VALIDITY OF RESULTS (K)

   1. Test results within a unit of study are only valid in the academic year in which they were obtained. The Examination Board can extend this period in individual cases at the request of the student.

Art 1.8 -   TYPE AND ORGANIZATION OF TESTS AND ASSESSMENT (L)

   1. The way tests and assessments are organized can be found in the tables 1 through 12 of article 1.1 of this appendix. The following abbreviations are used:

   A   (Assignments) students hand in (homework) assignments.

   D   (Deliverable) students demonstrate the results of an assignment (a working prototype, a result to be analysed and observed, not mere text)

E   (Essay) students hand in one or more essays.

O   (Oral) oral examination

R   (Report) written report

P   (Public defence) students give a presentation and (publicly) defend the results of an assignment

W   (Written) students participate in a session for a written exam.

These codes for assessment characterize exams. The examiner will observe these characteristics, but may add more detailed requirements for assessment.

2. The Programme Board will set and publish the assessment schedule for all units of study in tables 1 through 8, 11 and 12 (Article 1.1 of this appendix) in accordance with article 4.4.4 of the general teaching and examination regulations.

3. In the case of a minor (tables 9 and 10 in Article 1.1. of this appendix), the Teaching and Examination Regulations of the Programme providing that minor shall apply. This will also be the case for any extracurricular courses or modules.

4. Notwithstanding the provisions of article 4.4 of the general teaching and examination regulations, and article 1.8.2 of this appendix, the module examiner may decide in individual cases to pass a student an examination which deviates from the published standard.

   The examiner's authority to deviate from the scheme for test and assessment applies only in cases where the student has:

   a. previously participated in the same unit of study, and passed a number of tests in that unit of study with good results, without passing the exam for the entire unit of study.

   b. submitted a request for exemption from the standard scheme, which meets the requirements of the "alternative test and assessment procedure", established by the Programme Board and published at the programme's website.

5. Authority of the Examiner and the Examination Board regarding supplementary assessment (applicable only to units of study of Article 1.1, tables 1 through 8, 11 and 12 of this appendix)

   The examiner of each unit of study can offer participants a *supplementary assessment* for the unit.

   Students can not apply for admission to such a supplementary assessment

   Admission to supplementary assessment can be granted only to students who failed a unit of study, but who were close to success, and who have shown, despite their failure for this module, clear progress towards reaching the final qualifications of the programme.

   The Examination Board gives directions to the examiner regarding the admission of students to supplementary assessment.

6. Supplementary assessment (applicable only to units of study of Article 1.1, tables 1 through 8, 11 and 12 of this appendix)

   Supplementary assessment for a unit of study is conducted within a 10 weeks period after the moment the result of the unit of study is set. This does not entail

that candidates are entitled to have a 10 weeks period between the original result and the supplementary assessment.

For candidates who are admitted to the supplementary assessment, the result of the unit of study is suspended, until the result of the supplementary assessment is available (i.e. the suspension lasts at most 10 weeks)

If the result of supplementary assessment is negative, the result of the unit of study is the original result, that has been suspended until the supplementary assessment.

7. Final repair session (applicable only to units of study of Article 1.1, tables 1 through 8 of this appendix)

   a. The Programme Board chooses a time slot in the summer holiday period (July and/or August) where a limited number of tests will be offered for repair of failed modules.

   b. Admission to these final repair sessions is restricted, the programme board will invite students to participate; students cannot apply for participation in a final repair session.

Art 1.9 - CONDITIONS OF ADMISSION TO UNITS OF STUDY (S)

1. Students who were already enrolled for the Bachelor's programme Creative before September 1, 2013 and had education in the preTOM situation (the situation prior to the introduction of the Twente Education Model (Dutch: Twents Onderwijs Model or TOM)) can find the conditions of admission to their units of study in the transitional arrangements appendix to the teaching and examination regulations of the bachelor's programme Creative Technology.

2. Students cannot be registered for participation in two different modules at the same time. The Examination Board can grant an exemption of this rule in individual cases, upon request by the student.

3. Participation in units of study of the second year is not permitted during the first year of enrolment as a Creative Technology student. The requirements for units of the second year partly coincide with the conditions for a notice of admission (binding study advise).

4. To start a minor programme, the following conditions must be met:

   a. Units of study of the first and second years must have been completed with a total study load of at least 90 credits (i.e. 6 modules).

   b. (*Minor programme*) The student has completed the minor application procedure, as published on the programme's website by the Programme Board.

   b1 (*Minor programme at UT*) The student's choice of the minor programme is in agreement with the provisions of the matrix of options for join-in minors, in-depth minors, and High Tech, Human Touch (HTHT) minors, as established by the university and published on the university's website

   b2. (*Minor programme partly outside the UT*) The units of study in the *minor programme* are courses offered by an institution or programme which has

an accreditation proving its university level[26], or comparable. The Examination Board may rule otherwise.

b3. (*Minor programme partly outside UT*) The units of study devoted to foreign culture and language among the courses in the *minor programme* have a total study load of at most 10 EC.

b4. (*Internship as part of Minor programme*) the amount of practical work in the *minor programme* does not exceed a study load of 15 EC. In order to pursue an internship or practical work, the student needs to apply at the Traineeship Office of the EEMCS faculty.

b5. *(participation in a multidisciplinary project as part of the minor programme)* the units of study devoted to participation in a multidisciplinary project in the *minor programme* do not exceed 15EC. Examples of such projects at the UT are: Green Team and Solar Challenge. In order to be eligible for a multidisciplinary project the student needs to apply at the programme board.

5. The graduation semester consists of two modules, the Real World Perspective module (module 11) and the We CreaTe Impact module (module 12)

a. In accordance with article 3.2.2j of the general teaching and examination regulations, students must have completed all units of study (modules) of tables 1 through 8, i.e. modules 1 through 8 of the bachelor programme Creative Technology, before the start of their Real World Perspective module,

b. To start their We CreaTe Impact module, students must have completed their Real World Perspective module in the previous block.

Art 1.10 - MANDATORY PARTICIPATION IN PRACTICAL WORK AND/OR PRACTICAL EXERCISES TO BE ADMITTED TO THE EXAMINATION (T)

1. The tables in Article 1.1 of this appendix show for which units of study participation in practical work is mandatory in order to be admissible to the exam (if any).

2. Provisions (if any) regarding mandatory practical work are also to be found in Article 1.9 of this appendix.

Art 1.11 - SELECTION PROCEDURES FOR SPECIAL TRACKS WITHIN THE STUDY PROGRAMME (V)

There are no special tracks within the study programme that require selection procedures.

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[26] Although institutes for higher professional education are recognized as universities outside the Netherlands, they are *not* included in this Dutch use of "university level". For a minor programme at such an institute a student needs permission of the Examination Board.

PARAGRAPH 2
OTHER PROGRAMME SPECIFIC CHARACTERISTICS

Art 1.12 - LANGUAGE

See also the general Teaching and Examination Regulation, article 3.3.

1. The language of the programme is English. This applies to teaching and examination.

2. The Examination Board can grant permission to teach and conduct interim examination in another language. Permission can be granted only if it serves the quality of the assessment.

3. The dean issues a regulation concerning the assessment of English language proficiency of staff members who teach courses in the programme, and of the support staff for the programme. All staff involved must meet the language requirements of the regulation. Courses to improve English proficiency of staff members are provided.

Art 1.13 - STUDENT COUNSELLING

See also the general Teaching and Examination Regulation, article 6.2.

1. By Article 6.2.2 of the teaching and examination regulations, each student has a study adviser, who, in accordance with the university directive for study advice and notices of exclusion, is the primary person to address for students in matters concerning their study.

2. The study adviser for Creative Technology has a task in mentoring, i.e. personal guidance oriented to personal problems and personal growth.

Art 1.14 - PROFESSIONAL DEVELOPMENT

1. Every student of Creative Technology has a mentor. Mentors are university staff members who take care of academic guidance and professional growth of their mentees.

2. The Examination Board delegates advice and approval for choices of courses in the minor programme (i.e. modules 9 and 10) to the mentors.

Art 1.15 - THE DESIGNATED MASTER'S PROGRAMME

1. The master's programme for Creative Technology graduates, in accordance with section 7.13, subsection 3 of the Act, is the Human Media Interaction Programme of the University of Twente.

2. Admission to other Master's programmes may depend on the units of study in the student's minor programme. The Admissions Board of the Master's programme defines the requirements an applicant must meet to be eligible for admission.

Art 1.16 - THE ADMINISTRATION OF THE RESULTS FOR TESTS AND EXAMS

1. When an exemption is granted for a test, this is registered in the student information system as a result for that test, with code VR (Dutch: VRijstelling).

This VR result will count as a mark 6.0 when the weighted average of test results according to the test scheme of the unit of study is determined.

2. A student who is entitled to an exemption for a test, may decide to take the test anyway, in order to get a proper mark, instead of the VR and its associated 6.0.

3. A test may be marked by Pass or Fail only, instead of a score on the standard numeric scale. A Fail is registered by code NVD (Dutch: Niet VolDaan), a Pass is registered by code V (Dutch: Voldaan). No numeric values are associated with these codes for the purpose of determining averages.

Art 1.17 - PASS / FAIL REGULATION

1. Students who meet the following requirements will pass the Bachelor's final degree audit for the Creative Technology programme:

    a. The student has received an assessment for all units of study of the Bachelor's final degree audit,

    b. The student's marks are 6 or higher for all units of study;

    In all other cases, the student will not pass the final degree audit.

Art 1.18 - CUM LAUDE (WITH DISTINCTION)

1. A student may pass the Bachelor's final degree audit with distinction (cum laude). As a guideline for determining whether to award a degree with distinction, all of the following conditions should be met:

    a. the average of the assessment marks, scored on modules of the bachelor's examination, is at least 8.0;

    b. when determining the above average, the modules for which no marks have been awarded or for which exemptions were granted will be left out of consideration;

    c. none of the modules of the examination programme has been awarded an unsatisfactory mark and no more than one module has been awarded a 6;

    d. exemptions have been granted for no more than one third of the total degree programme;

    e. the final mark for the topic Graduation Project within the Final Module is at least an 8.0.

    f. the bachelor programme has been completed within four years (performance requirement).

2. In exceptional cases and at the student's request, the Examination Board may award the distinction of cum laude if the student has met all requirements with the exception of the performance requirement, due to extenuating circumstances. These circumstances may involve delays recognised and provided for by the institution. It should be noted that the distinction of cum laude is never awarded automatically.

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Art 1.19 - REGULATIONS REGARDING BSA (NOTICE OF EXCLUSION)

1. Creative Technology uses the BSA module of the student information system.

2. Recommendations regarding the continuation of studies are based on results that are registered for units of study (i.e. for module results and not for the results of (sub)tests within modules).

3. The Creative Technology programme imposes no additional requirements for a positive recommendation except the requirement that 45EC must have been completed, in accordance with article 6.3.7. of the general teaching and examination regulations.

4. Students will receive their formal recommendations digitally (i.e. not on paper, and with a digital signature). The recommendations are formulated in accordance with the provisions of these regulations.

Art 1.20 - REGULATIONS REGARDING CONFIDENTIALITY AND NON-DISCLOSURE

1. The thesis of the Graduation Project is a public document; both presentation and defence of the Graduation Project presentation are public.

2. The Programme Board may decide to suspend publication of the Graduation Project thesis for a limited period of time, and to declare the information in the thesis to have a confidential status

   a. Confidentiality can be granted only if the thesis supervisor asks for confidentiality at the start of the Graduation Project

   b. Even under an agreement of confidentiality, the thesis is accessible for parties who have duties and responsibilities regarding the quality of education: the Programme Director, the Board of Examiners, and, when applicable, the Quality Assessment Committee for accreditation.

   c. Parties with access to a confidential thesis will respect confidentiality, and sign a non-disclosure agreement if so required.

3. There is no exception to the rule that the Graduation Project presentation and defense are public.

4. The nature of the Graduation Project presentation may be adapted to prevent confidential information becoming public.

Art 1.21 - EVALUATION AND SAFEGUARDING OF EDUCATION

See also the general teaching and examination regulation, article 4.10. To monitor and improve the quality of teaching, the Creative Technology BSc programme uses information about the students' learning experiences.

1. Each student participating in a module will receive an invitation to participate in the UT – Student Experience Questionnaire (UT-SEQ).

2. The programme board has installed an independent, student-run evaluation committee: The CreaTe Evaluation Committee (CREEC). The CREEC will

organize at least two panel discussions per module. The minutes of each panel discussion will be published on a website, accessible to both UT employees and students.

    a. The first discussion will take place half-way the completion of the module (weeks 4 or 5).

    b. The second discussion will take place within two weeks after the completion of the module.

    c. At the request of the module coordinator, or the programme committee, or the programme board the CREEC can organise an additional panel discussion.

3. The programme board in consultation with the module coordinator will organize panel discussions between programme board, teachers and students.

4. The following external sources are used:

    a. The National Student Survey (in Dutch: Nationale Studenten Enquete (NSE)).

    b. The International Student Barometer.