GUIDE FOR DESIGN OF
STUDY PROGRAMMES
AND COURSES AT NTNU
(THE PROGRAMME
DESCRIPTION GUIDE)
NTNU 2019
Innhold

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About the programme description guide

The guide for the design of study programmes and courses at NTNU (the Programme Description Guide) should be seen in the context of the document Requirements for the academic portfolio at NTNU, which contains a description of the strategic assessments to be made when establishing new programmes.

The programme description guide is founded on Section 4-1 (3) of NTNU’s Academic Regulations. Section 4-2 (1) and (2) of the Academic Regulations describe what a programme description and course description must include as a minimum. There are also requirements founded on the Academic Supervision Regulations. The Programme Description Guide must be followed for the description of all educational provision that falls under the definition of a programme of study in Section 1-2 of the Academic Regulations:

A programme of study is an academic entity consisting of a collection of courses with an overall learning outcome, to which students can apply and be admitted. A characteristic of a programme of study is that it is not necessary to reapply for admission in order to take new courses within the programme of study.

Purpose

The Programme Description Guide is based on requirements set out by the Ministry of Education and Research in the Regulations concerning quality assurance and quality development in higher education and tertiary vocational education (studiekvalitetsforskriften), NOKUT’s Academic Supervision Regulations, and the Academic Regulations for NTNU (studieforskriften).

Through its standardized format, the guide will help to increase the quality of education at NTNU. A common specification of requirements for all study programmes makes it easier for students, applicants and external stakeholders to obtain and use information about educational offerings at NTNU. It also becomes easier for programme councils and units to design programme descriptions and course descriptions when everyone uses the same template.

The guide is to be used as part of the preparations for establishing new programmes of study and is to be used by course coordinators, heads of programmes, faculties, executive committees, etc. in the annual reviews and the audits of existing study programmes.

Process for developing programme descriptions and course descriptions

The quality initiatives provide the basis for the programme description process and are made clear in NTNU’s annual cycle for this process; see Appendix 1. The timeline for the process is illustrated in Appendix 2 and described in more detail in Requirements for the academic portfolio at NTNU.

Section 4-1 of the Academic Regulations states who has delegated authority for the establishment and closure of study programmes.

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1 This includes both programmes of study that lead to a degree and shorter educational offerings such as one-year programmes, further education and courses that are offered separately and that are not part of a study programme; see Directive F-03-16 from the Ministry of Education and Research. The guide is applicable regardless of how the programme of study is organized (campus-based, based on group sessions, online, decentralized, etc.)

2 The process chart relates to the institutional level. Each faculty controls its own approach to the process.
The Pro-Rector for Education together with the Education Quality Division has dialogue meetings with the faculties and can provide assistance with advice and guidance on fulfilment of key requirements and guiding principles.

It is also recommended to involve other units in the central university administration in developing the programme descriptions and course descriptions when needed.

The description of the programme of study must be complete and approved by the faculty by 1 April. For the course descriptions, the deadline is 15 January; see NTNU’s annual cycle.

The programme descriptions and course descriptions create a commitment and are legally binding for NTNU. They must be correct at all times. Students are entitled to clear and precise information about how to plan and carry out their studies, as well as their rights and obligations. No programme or course information can be changed after it has been approved and announced to students. Changes in connection with procedural errors or other exceptional circumstances are made under the authority specified in Section 4-2 of the Academic Regulations.

Laws and regulations

Programmes of study at NTNU must fulfil all the requirements of relevant laws and regulations, with accompanying supplementary regulations and guidelines. An overview of the regulations and framework in effect is available on NTNU’s summary page³.

About the programme of study

As well as completion of the fields below, the programme description must include the following information: the date of the approved programme description, the name of the unit that has approved the programme description, and the date of the previous and next planned periodic evaluation of the programme of study where applicable; see the Guide to periodic evaluation of programmes of study.

The fields that do not concern the programme of study, for example, programmes in which students are not subject to suitability assessment, must be left blank.

Framework for the programme of study

Name of the programme of study

The programme of study must have an appropriate name – see Section 2-2 (1) of the Academic Supervision Regulations. The name must provide students, employers and the community with a clear understanding of the programme’s content. The name of the programme must be specified in Norwegian Bokmål, Norwegian Nynorsk and English. If it is an international programme, the information should only be available in English.

Name of the degree

The name of the degree and any additional designation must be specified in Norwegian Bokmål, Norwegian Nynorsk and English. See sections 2-10 to 2-12 of the Academic Regulations for rules on the structure of names, including English names.

³ Laws and regulation (web-page in Norwegian)
Education level (NQF cycle)

Specify the level of education in terms of the stages of the cycles in the NQF:

- 1st cycle: bachelor’s degree, professional training qualification and further education (may be in the first or second cycle).
- 2nd cycle: master’s degree, cand.med., cand.psychol., professional training qualification (five-year primary and lower secondary teacher education) and further education (may be in the first or second cycle).
- 3rd cycle: PhD and Dr philos.

Language of instruction

Language of instruction for the study programme.

Nominal length of study

Specify the number of years of study and whether it is a part-time- or full-time programme. Specify the scope in terms of credits.

Workload

Estimated workload per week and / or per academic year, divided between organized learning activities, self-study and preparation for examinations.

The academic year is specified as 10 months; see Section 3-8 (1) of the Universities and University Colleges Act.

The basis for programmes of study at NTNU is that an academic year amounts to a minimum of 1 600 hours and normally not more than 1 800 hours of work for students. The academic year is set at 40 weeks and a full-time programme results in 60 credits per year. Broken down, this has the following implications for the average work effort expected from students (certain courses and certain programmes of study may have higher requirements for students):

- 40 – 42.5 hours a week (average for the academic year).
- 26 – 29 hours per credit (average for the year of study)
- One -1- week’s work corresponds to about 1.5 credits
- A course worth 7.5 credits corresponds to about 5 weeks of work.

Host faculty and host department

Specify the host faculty and (if applicable) the host department for the programme.

National curriculum reference

For programmes of study with national curriculum regulations, or a curriculum recommended by Universities Norway (UHR), with national guidelines, refer to the correct curriculum.

Evaluation

Give a brief overall description of the evaluation methods that are used at programme and course level, see the Quality System for Education⁴.

⁴ Quality assurance of education
Admission

Admission requirements

Refer to the national Regulations on admission to higher education (forskrift om opptak til høyere utdanning) when the programme is advertised through NUCAS, the Norwegian Universities and Colleges Admission Service (Samordna Opptak). Refer to the regulations on admission to NTNU when admissions are managed by NTNU. For ranking rules, also refer to the national regulations on admission, or to NTNU’s admission regulations if applicable. Admission and ranking rules are designed in a dialogue with the Academic Administrative Division, specialist group for admissions.

Certificate of good conduct

If a certificate of good conduct from the police (politiattest) is required for admission, this must be specified. Refer to the specific legal authority for the requirement; see Chapter 6 of the Regulations on admission to higher education. Also refer to NTNU’s web page for police certificates of good conduct\(^5\).

Medical certificates

If documentation of MRSA and tuberculosis status, a personal statement of health, vaccinations related to practical training or similar are required, this must also be specified.

Suitability assessment and authorization

If the programme is subject to suitability assessment, this must be made clear here; see Section 3-6 of the Academic Regulations. Briefly describe the suitability assessment throughout the programme and the criteria applicable to the programme with a link to NTNU’s web page on suitability assessment\(^6\).

If graduates who have completed their education and received their diploma are covered by the authorization scheme (see Section 48 of the Health Personnel Act), this must be stated.

Special requirements and conditions

Additional information about the programme of study can be specified here. This applies to matters that are not part of the admission requirements. If special requirements for technology apply to participation in the programme, these must be specified. These may concern special software or requirements for computers and hardware; see Section 3-10 of the Academic Regulations. Some programmes of study are subject to various certification schemes, which must also be described.

The programme of study in brief

Give a brief overall introductory description of the programme for the primary audience: students. The introduction can describe the academic content, objective, work-related relevance, general requirements for completion and other relevant aspects that are emphasized in the programme. If the programme is implemented jointly with other institutions, this must be stated. It is not necessary to describe the organization and structure of the courses in the programme. This takes place later.

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\(^5\) [Certificate of good conduct](document in Norwegian)

\(^6\) [Suitability assessment](document in Norwegian)
Learning outcome descriptions

The Norwegian Qualifications Framework for Lifelong Learning (NQF) defines learning outcomes as follows:\(^7\):

Learning outcomes are what a person knows and is able to do as a result of a learning process.

Describe learning outcomes in the form of “knowledge”, “skills” and “general competence”. NQF requires us to structure programmes of study in such a way that the content (learning activities) supports the expected learning outcomes, and that forms of assessment / examination are designed to enable testing of the expected learning outcome. For NQF’s requirements for learning outcomes for all 3 cycles (bachelor’s degree, master’s degree, and PhD), with a table for entering the programme’s learning outcomes, see the Appendices.

Programmes of study that are governed by national curriculum regulations with defined learning outcomes set national requirements for the knowledge, skills and general competence that a graduate from a programme of professional study must have. At NTNU, we demonstrate our competitive advantage in the programmes governed by national curricula when we formulate learning outcomes for these programmes. Also see Section 2-2 fourth and fifth subsection of the Academic Supervision Regulations regarding the guidelines that learning outcomes provide.

The learning outcome should highlight the distinctive character and the competence that the student should have gained for future professional practice and/or further studies.

The learning outcome descriptions must be unique to the individual educational offering. NTNU’s graduates must be characterized by knowledge of their discipline, greater curiosity than they had when they started their studies, and sound values. The section on general competence in the learning outcome description must be formulated to address NTNU’s aspirations for our students in this way.

Any national requirements within the subject area must be given specific form in the learning outcome applicable to this specific programme of study. The learning outcome for a programme of study is achieved through the combined learning outcomes for the various courses that are included in the programme. See the Appendix for a table for use as a planning aid to help ensure that all the programme’s learning outcomes are realized through individual courses and that all courses contribute to helping the student to achieve the programme’s learning outcome.

There must be a clear progression in the learning outcomes for the courses that are included in the programme of study. See the appendices for a description of taxonomies.

Formulation of learning outcomes:\(^8\):

- Write a limited number of outcome descriptions for each area. For the programme of study, the Qualifications Framework or national curricula may provide a framework.
- The outcome description should be performance-neutral: The description should not include adjectives stating what constitutes good performance. This is specified through the grading system.
  Formulations such as “the candidate understands key theories within ...” are recommended in preference to “the candidate shows a good understanding of key theories within ...”

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\(^7\) The Norwegian Qualifications Framework for Lifelong Learning (NQF)

\(^8\) Examples of relevant literature – see Appendix 7
- Descriptions of learning outcomes must specify the student’s competence after completion of the programme of study. The description applies to everyone who has passed the course, and is not a description, for example, of the average C student. The learning outcomes must be performance-neutral
- Use active verb forms with an explicit subject. “The candidate understands”, not “it is understood”
- The learning outcome is specified in a way that makes it possible to document that the student has achieved the goal. If one states that students should be able to exercise a skill, the teaching and assessment must be designed to enable the student to practise this and to enable documentation that it can actually be performed. This is a critical factor in connection with learning outcomes related to skills.

The description of the candidate’s expected learning outcome as stated in the diploma must fully match the study programme’s learning outcome. The description of learning outcomes must be available in Norwegian Bokmål, Norwegian Nynorsk and English.

Programme structure

Overview of the structure and courses in the programme of study

Specify the following
- Overview of courses in the study programme; clearly show the progression from semester to semester for all the years of study in the programme.
- Which courses are compulsory and which are elective. Include any reservations about changes in elective courses.
- Any requirements for progression/qualification for admission to the next year.
- Specialization in the programme; any requirements for the extent of specialization required to achieve the degree. For bachelor’s degrees, the courses included in the specialization must be specified.
- Programme options (profile).

Common courses

Specify any common courses in the degree; see Section 4-11 of the Academic Regulations. Which variant of ex.phil (Examen philosophicum) is included; specify the subject area course\textsuperscript{9}, Experts in Teamwork (EiT) (intensive/semester-based), as well as any restrictions for selection of common courses.

Deadlines and choices

At what stage of the programme of study do students choose programme options, specializations, elective courses, etc?

Requirements for progression

Formal requirements for progress, qualification for admission to the next year of study if applicable.

International student exchange

Describe which semester is best suited for student exchange in the degree-conferring programmes of study. Provide a rough overview of the institutions or countries with which exchange agreements have been made.

\textsuperscript{9} See Guide for developing subject area courses at NTNU (document in Norwegian)
entered. The content of the exchange must be academically relevant – see Section 2-2 (8) of the Academic Supervision Regulations.

**Transitional arrangements**

If programme descriptions are changed in a way that may have consequences for the progression of students who are already taking the programme, transitional arrangements to ensure that these students are not delayed must be described.

**Learning methods**

The learning methods must be adapted to the expected learning outcome for the programme of study – see Section 2-2 (5) of the Academic Supervision Regulations. Provide a general description of the type of learning methods and approaches to work used in the programme of study, based on the learning methods and approaches to work in the course descriptions to the programme of study. Specify how the programme facilitates student activity and how this is adapted to a digitalized society.

The students’ total workload is divided among a variety of activities such as lectures, academic supervision, thesis seminars, discussion groups, practical training, laboratory work, independent work (literature studies, assignments, discussions, etc.), and taking examinations. On this basis, estimate the distribution of the time spent between scheduled forms of learning, non-scheduled forms of learning, and students’ own work / self-study. This applies per week and / or per academic year.

**Excursions**

Describe any excursions. Pay particular attention to guidelines in force for study trips. If alternatives to voluntary study tours are created, these must be described.

**Practical training**

Describe the scope and organization of practical training, as well as other relevant information about the training such as reference to relevant guidelines, requirements for completion, etc.

**Forms of assessment**

The forms of assessment in the study must be designed in a way that makes it possible to use the most appropriate methods of measuring the student’s achievement of the learning outcome – see Section 2-2 (5) of the Academic Supervision Regulations. Good variation in forms of assessment is also a clear expectation from the Norwegian Agency for Quality Assurance in Education (NOKUT). As a starting point, use the forms of assessment in the courses in the programme of study when the forms of assessment are described.

**Internationalization**

All NTNU graduates must have acquired international competence that is relevant to the subject area. Describe which schemes other than student exchange the programme of study provides for internationalization, adapted to the level, scope and distinctive character of the programme. In this case the programme is the centre for internationalization, and the activities may include a variety of activities such as

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10 For study programmes with few students and / or a geographically dispersed student group, this rule means that NTNU must take steps to ensure a good study environment enabling academic interaction between the students and/or between the students and the academic environment

11 Guidelines in force for study trips (document in Norwegian)
use of international literature, international guest lecturers, international students, participation in international conferences, etc.

**Career opportunities/further study**

Describe how the study programme is academically relevant to working life with specific examples of possible career paths – see Section 2-2 (2) of the Academic Supervision Regulations. Provide specific examples of possible further study at NTNU, and subject areas with programmes of study at other institutions.

**Entrepreneurship and innovation**

NTNU’s strategy, Knowledge for a Better World\(^\text{12}\), makes it clear that innovation is a key element of NTNU’s educational offerings, and that NTNU’s students must acquire skills in innovation and address problem formulations relevant to working life. Describe how innovation and entrepreneurship are integrated in the programme of study.

**Course descriptions**

For all courses, there must be a course description with content that fulfils specific requirements – see Section 4-2 (2) of the Academic Regulations and the Academic Supervision Regulations. Requirements for the content of the course description are listed below.

**Course name**

The course must have an appropriate name. The course name must be specified in Norwegian Bokmål, Norwegian Nynorsk and English. The course code is assigned according to the guidelines in force.

**Credits**

The scope of the course must be specified in credits.

**Level**

Specify the level of the course; see the stages of the NQF cycles, with cycle 1, cycle 2 or cycle 3.

**Teaching semester**

Specify the semester(s) in which the course is offered. Spring and/or autumn, and whether the course may span two or more semesters.

**Language of instruction**

Specify the language of instruction. Teaching can be provided in a Scandinavian language or English; see NTNU’s Guidelines on Language Policy and NTNU’s International Action Plan. The exception here is for the language disciplines.

**Teaching location**

Specify the NTNU campus location(s) where teaching takes place.

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\(^{12}\) NTNU’s strategy, Knowledge for a Better World
Academic content

Give a brief description of what the course involves. The description must be seen in the context of the expected learning outcomes. If the course is a subject area course, specify the affiliation and generic theme of the subject area.

Learning outcomes

The description of learning outcomes at course level should be far more specific and measurable through the forms of assessment than the corresponding descriptions at programme level. At course level, there is no absolute requirement for formulation of learning outcomes within all the dimensions in the Qualifications Framework. For many courses, it is natural to cover all dimensions, but some courses have a strong focus on knowledge, while the primary focus of other courses may be on skills. The sum of all the courses in the programme of study must ensure coverage of the overall learning outcomes for the programme within all three dimensions.

Learning outcomes should be formulated concisely and be easy to understand. It is important to refer clearly and specifically to what the student knows and can do after passing the course.

At course level, it is very important that the relationship between learning outcomes and the chosen learning methods and assessment forms is well-considered and clear.

Use active verb forms with an explicit subject. “The candidate understands”, not “it is understood” Learning outcome descriptions must specify the minimum academic requirements that apply in order to pass the course with regard to knowledge, skills and general competence.

Show the progression in the learning outcomes during the programme. For example: In a course in the first year, the student is expected to be able to refer to key theories, while in the third year the student is expected to understand and be able to discuss the use of key theories. See Appendix 2 for a list of taxonomies for the different categories: knowledge-skills-general competence.

Recommended previous knowledge

If specific previous knowledge is desirable, but not required, this may be stated here. This is to help students who would like to choose the right course.

Required previous knowledge, restricted admission and reservation for students admitted to a particular programme

Specify the courses that must be passed in order to be able to register for the course and/or take the examination. Specify the courses with the course name and course code. Make it clear whether the student can start the course without required previous knowledge, but not take the examination, or whether the required previous knowledge also applies to starting the course.

Specify whether admission to the course is restricted.

Specify whether the course is reserved for students admitted to a particular programme. This means whether one must be a student in a specific programme of study in order to participate in the teaching and to take the examination for the course, and the programme(s) of study to which this applies.
Learning methods
Describe how the teaching is designed to promote the student’s learning – see Section 2-2 (5) of the Academic Supervision Regulations. There should be a clear relationship between the expected learning outcomes for the course and the teaching methods chosen for the course.

Compulsory activities
Compulsory activities are work and tests that must be approved as a prerequisite for the right to assessment, but where the result is not included in the calculation of the grade for the course. The compulsory activities must be described precisely, the number of activities must be specified, and the activities must be assessed as approved/not approved. Examples include reports, exercises, methods courses, practical training, field courses, laboratory work, or performances.

Form of assessment and grading scale
The form(s) of assessment must be adapted to the expected learning outcomes and must be described exhaustively and precisely. Specify the duration\(^\text{13}\) of the form of assessment. Specify whether the form of assessment may be changed if the examination is rescheduled; see Section 5-6 (1) of the Academic Regulations. If the form of assessment is other than a written examination, cf. Section 5-6 (2) of the Academic Regulations, specify how rescheduled examinations will be organized (applies to rescheduled examinations in connection with legitimate absence).

For portfolio assessment, it must be stated what the portfolio must include, what must be included in the basis for assessment, the nature and scope of the individual portfolio contributions, and how choices should be made if only selected contributions are to form the basis for grading.

If the course has more than one assessment scheme, that is, component assessments as described in Section 1-2 of the Academic Regulations, the following must be clarified:
- the percentage weighting of the component assessments.
- which component assessments must be repeated if students do not pass the course, or whether all component assessments must be repeated; see section 5-6 (3) of the Academic Regulations
- which component assessments must be repeated if students wish to improve their grade in the course, or whether all component assessments must be repeated; see Section 5-6 (4) of the Academic Regulations.
- If the component assessments take place during the semester and prevent further participation in the course if the component assessment is not passed, it must be made clear whether an appeal against the grade can be made after the separate component assessment; see Section 6-2 (7) of the Academic Regulations.

Provide an exhaustive and precise list of permitted aids for written examinations. On a general basis, bringing a dictionary to the examination is permitted. For language studies, which will have exceptions to the general basis, this must be made clear.

For a practical course where completion of the course is to be regarded as the form of assessment, specify whether it is possible to apply for a third attempt in the course; see Section 5-10 of the Academic

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\(^{13}\) Example: 3-hour written or two-week take-home examination, etc.
Regulations.
Specify the assessment scale (letter grades or pass/fail).

Credit reduction due to overlapping courses
Specify whether the course overlaps entirely or partially with another course; see Section 4-6 of the Academic Regulations.

Course coordinator
Specify the course coordinator.

Responsible unit
Specify the department and faculty responsible for the course.

Other relevant information
Other provisions important for the implementation of the course can be specified here. For example, course fees.

Teaching materials
Specification of teaching materials is not a mandatory part of the course description, but it is a requirement that a curriculum summary has been prepared for each course, and that an updated summary is available before the start of the semester.

Course evaluation
Specify briefly how the course evaluation is carried out.\textsuperscript{14}

\textsuperscript{14} Completing student evaluations of courses
Appendices

Appendix 1 Timeline for the academic portfolio process for the academic year 2020-2021
Appendix 2 Annual cycle for the academic portfolio process
### Appendix 3 The Norwegian Qualifications Framework and learning outcomes

#### 1st cycle

<table>
<thead>
<tr>
<th>Knowledge (K), Skills (F) and General competence (G)</th>
<th>[Programme name]</th>
</tr>
</thead>
<tbody>
<tr>
<td>NQF</td>
<td>The candidate:</td>
</tr>
<tr>
<td>1K1 has broad knowledge of key topics, theories, issues, processes, tools and methods in the subject area</td>
<td></td>
</tr>
<tr>
<td>1K2 is familiar with research and development work in the subject area</td>
<td></td>
</tr>
<tr>
<td>1K3 can update their knowledge within the subject area</td>
<td></td>
</tr>
<tr>
<td>1K4 has knowledge of the subject area’s history, traditions, distinctive character and place in society</td>
<td></td>
</tr>
<tr>
<td>1F1 can apply academic knowledge and relevant results from research and development work on practical and theoretical issues and make well-founded choices</td>
<td></td>
</tr>
<tr>
<td>1F2 can reflect on their own academic practice and adjust this under academic supervision</td>
<td></td>
</tr>
<tr>
<td>1F3 can find, evaluate, and cite information and academic material and present this in a way that sheds light on the problem at hand</td>
<td></td>
</tr>
<tr>
<td>1F4 can master relevant tools, techniques and forms of expression in the discipline</td>
<td></td>
</tr>
<tr>
<td>1G1 has insight into relevant disciplines and issues of professional ethics</td>
<td></td>
</tr>
<tr>
<td>1G2 can plan and carry out varied assignments and projects that extend over time, alone and as a participant in a group, and in accordance with ethical requirements and principles</td>
<td></td>
</tr>
<tr>
<td>1G3 can convey key academic material such as theories, problem formulations and solutions, in writing, orally and through other relevant forms of communication</td>
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<tr>
<td>1G4 can exchange points of view and experiences with others who have a background in the subject area, thus contributing to the development of good practice</td>
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<tr>
<td>1G5 is familiar with innovative thinking and innovation processes</td>
<td></td>
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#### 2nd cycle

<table>
<thead>
<tr>
<th>Knowledge (K), Skills (F) and General competence (G)</th>
<th>[Programme name]</th>
</tr>
</thead>
<tbody>
<tr>
<td>NQF</td>
<td>The candidate:</td>
</tr>
<tr>
<td>2K1 has advanced knowledge within the academic field and specialized insight in a limited area</td>
<td></td>
</tr>
<tr>
<td>2K2 has thorough knowledge of the scholarly or artistic theories and methods in the field</td>
<td></td>
</tr>
<tr>
<td>2K3 can apply knowledge to new areas within the academic field</td>
<td></td>
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<tr>
<td>2K4 can analyse academic problems on the basis of the history, traditions, distinctive character and place in society of the academic field</td>
<td></td>
</tr>
<tr>
<td>2F1 can analyse and deal critically with various sources of information and use them to structure and formulate scholarly arguments</td>
<td></td>
</tr>
<tr>
<td>2F2 can analyse existing theories, methods and interpretations within the subject area and work independently on practical and theoretical problem solving</td>
<td></td>
</tr>
<tr>
<td>2F3 can use relevant methods for research and academic and/or artistic development work in an independent manner</td>
<td></td>
</tr>
</tbody>
</table>
2F4 can carry out an independent, limited research or development project under supervision and in accordance with applicable norms for research ethics

2G1 can analyse relevant problems in the subject area, profession, and research

2G2 can apply his/her knowledge and skills in new areas in order to carry out advanced assignments and projects

2G3 can disseminate extensive independent work and masters the academic field’s forms of expression

2G4 can communicate about academic issues, analyses and conclusions in the field, with both specialists and the general public

2G5 can contribute to new thinking and innovation processes

3. cycle

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<thead>
<tr>
<th>NQF</th>
<th>Knowledge (K), Skills (F) and General competence (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3K1</td>
<td>Is in the forefront of knowledge within his/her academic field and masters the field’s philosophy of science and/or artistic issues and methods</td>
</tr>
<tr>
<td>3K2</td>
<td>can evaluate the expediency and application of different methods and processes in research and scholarly and/or artistic development projects</td>
</tr>
<tr>
<td>3K3</td>
<td>can contribute to the development of new knowledge, new theories, methods, interpretations and forms of documentation in the field.</td>
</tr>
<tr>
<td>3F1</td>
<td>can formulate problems, plan and carry out research and scholarly and/or artistic development work</td>
</tr>
<tr>
<td>3F2</td>
<td>can carry out research and scholarly and/or artistic research work of a high international standard</td>
</tr>
<tr>
<td>3F3</td>
<td>is capable of dealing with complex academic issues and challenging established knowledge and practice in the subject area</td>
</tr>
<tr>
<td>3G1</td>
<td>can identify new relevant ethical issues and carry out his/her research with scholarly integrity</td>
</tr>
<tr>
<td>3G2</td>
<td>can manage complex interdisciplinary assignments and projects</td>
</tr>
<tr>
<td>3G3</td>
<td>can communicate research and development work through recognized Norwegian and international channels</td>
</tr>
<tr>
<td>3G4</td>
<td>can participate in debates in the field in international forums</td>
</tr>
<tr>
<td>3G5</td>
<td>can assess the need for, initiate and practice innovation</td>
</tr>
</tbody>
</table>
Appendix 4. Taxonomies

This appendix is included to provide inputs to formulating learning outcomes, including relevant verbs. It is not intended to be a complete methodical approach to learning outcome descriptions.

Knowledge objectives

Often called cognitive objectives (Bloom’s taxonomy)

<table>
<thead>
<tr>
<th>COGNITIVE LEVELS</th>
<th>Examples of verbs that can be used in learning goals for knowledge (in the cognitive domain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REMEMBERING (&quot;lowest&quot;)</td>
<td>Recognize, Reproduce, Recall, State</td>
</tr>
<tr>
<td>UNDERSTANDING</td>
<td>Rewrite, Explain, Confirm, Demonstrate</td>
</tr>
<tr>
<td>APPLICATION</td>
<td>Predict, Select, Explain, Use</td>
</tr>
<tr>
<td>ANALYSIS</td>
<td>Analyse, Infer, Break down, Find out</td>
</tr>
<tr>
<td>SYNTHESIS</td>
<td>Combine, Relate, Derive, Suggest, Select</td>
</tr>
<tr>
<td>EVALUATION (&quot;highest&quot;)</td>
<td>Assess, Appraise, Debate, Discuss, Conclude</td>
</tr>
</tbody>
</table>

Skills attainment target

Often called psychomotor objectives (Simpson’s taxonomy)

<table>
<thead>
<tr>
<th>PSYCHOMOTOR LEVELS</th>
<th>Examples of verbs that can be used in learning objectives for skills (in the psychomotor domain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERCEPTION (&quot;lowest&quot;)</td>
<td>Detect, focus, recognize, register</td>
</tr>
<tr>
<td>READINESS TO ACT</td>
<td>Prepare, focus, participate, follow</td>
</tr>
<tr>
<td>Imitation and Trial and Error</td>
<td>Imitate, mimic, copy, repeat</td>
</tr>
<tr>
<td>HABITUAL ACTION</td>
<td>Undertake, adapt, distinguish, adjust, use, apply</td>
</tr>
<tr>
<td>COMPLEX SKILLS</td>
<td>Make, construct, create, process, produce</td>
</tr>
<tr>
<td>Refined and Developed Skills (&quot;highest level&quot;)</td>
<td>Improvise, combine, complete, master</td>
</tr>
</tbody>
</table>
Attitudinal objectives
(Krathwohl’s taxonomy) Often called affective objectives Note that the concept “General competence” in the Qualifications Framework is broader than attitudes.

<table>
<thead>
<tr>
<th>AFFECTIVE LEVELS</th>
<th>Examples of verbs that can be used in learning objectives for attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>RECEPTIVENESS</td>
<td>Be: aware of, attentive to, concerned about, determined to, sensitive to</td>
</tr>
<tr>
<td></td>
<td>Perceive, detect, monitor, listen, register</td>
</tr>
<tr>
<td></td>
<td>Take into account, observe, be self-aware, see, taste, smell, sense, notice</td>
</tr>
<tr>
<td>RESPONSIVENESS</td>
<td>Obey, follow, comply, allow, accept, approve, concede, tolerate, endure</td>
</tr>
<tr>
<td></td>
<td>(Voluntarily) engage oneself, do, implement, take responsibility for, get involved in</td>
</tr>
<tr>
<td></td>
<td>Seek, follow up, be concerned about, be sensitive to something, be happy about, be fond of, like, enjoy, see through</td>
</tr>
<tr>
<td>VALUING</td>
<td>Accept, recognize, appreciate, desire to develop or achieve, show respect for, emulate</td>
</tr>
<tr>
<td></td>
<td>Prefer, live up to, identify oneself with, adapt</td>
</tr>
<tr>
<td></td>
<td>Take the lead, take the initiative, take care of, take responsibility for, be bound by</td>
</tr>
<tr>
<td>ORGANIZATION</td>
<td>Identify oneself with, judge, determine, establish, clarify, associate, decide</td>
</tr>
<tr>
<td></td>
<td>Find, shape, develop, conclude, internalize (assimilate)</td>
</tr>
<tr>
<td></td>
<td>Compare, see differences/connections, weigh up</td>
</tr>
<tr>
<td>CHARACTERIZATION BY A VALUE OR A VALUE SET (“HIGHEST”)</td>
<td>Generalize, internalize, investigate, examine, reject, select, oppose, combat</td>
</tr>
<tr>
<td></td>
<td>Integrate, implement, change, make one’s own, be characterized by</td>
</tr>
<tr>
<td></td>
<td>Evaluate (critically), realize, expand, influence</td>
</tr>
</tbody>
</table>
Appendix 5. Combined learning outcomes for the programme of study by course

<table>
<thead>
<tr>
<th>Programme’s learning outcomes (K=Knowledge, F=Skills, G=General competence)</th>
<th>Courses in the programme and which learning outcomes at programme level the courses help to fulfil</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-1</td>
<td></td>
</tr>
<tr>
<td>K-2</td>
<td>X</td>
</tr>
<tr>
<td>K-3</td>
<td>X</td>
</tr>
<tr>
<td>K-4</td>
<td>X</td>
</tr>
<tr>
<td>K-5</td>
<td></td>
</tr>
<tr>
<td>F-1</td>
<td></td>
</tr>
<tr>
<td>F-2</td>
<td></td>
</tr>
<tr>
<td>F-3</td>
<td></td>
</tr>
<tr>
<td>F-4</td>
<td></td>
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<tr>
<td>F-5</td>
<td></td>
</tr>
<tr>
<td>G-1</td>
<td></td>
</tr>
<tr>
<td>G-2</td>
<td></td>
</tr>
<tr>
<td>G-3</td>
<td></td>
</tr>
<tr>
<td>G-4</td>
<td></td>
</tr>
<tr>
<td>G-5</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 6. Bibliography

Guides to the requirements of the Academic Supervision Regulations
Veiledning om akkreditering av studietilbud (Guidance on accreditation of study programmes) Norwegian Agency for Quality Assurance in Education (NOKUT) May 2017 (In Norwegian)

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Osters, S. Writing Measurable Learning Outcomes
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Karlsen, H. Klare for arbeidslivet? En drøfting av metodiske utfordringer for måling av læringsutbytte i høyere utdanning (Ready for the working world? A discussion of methodological challenges for measuring learning outcomes in higher education) NIFU/STEP-report 42/2011 (in Norwegian)
Utkast til forskrift om nasjonalt kvalifikasjonsrammeverk for livslang læring og om henvisning til Det europeiske kvalifikasjonsrammeverket for livslang læring (Draft regulation for the Norwegian Qualifications Framework for Lifelong Learning and referencing to the European Qualifications Framework for Lifelong Learning)

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