

GUIDE TO DEVELOPING PROGRAMME DESCRIPTIONS AND COURSE DESCRIPTIONS AT NTNU

NTNU 2017

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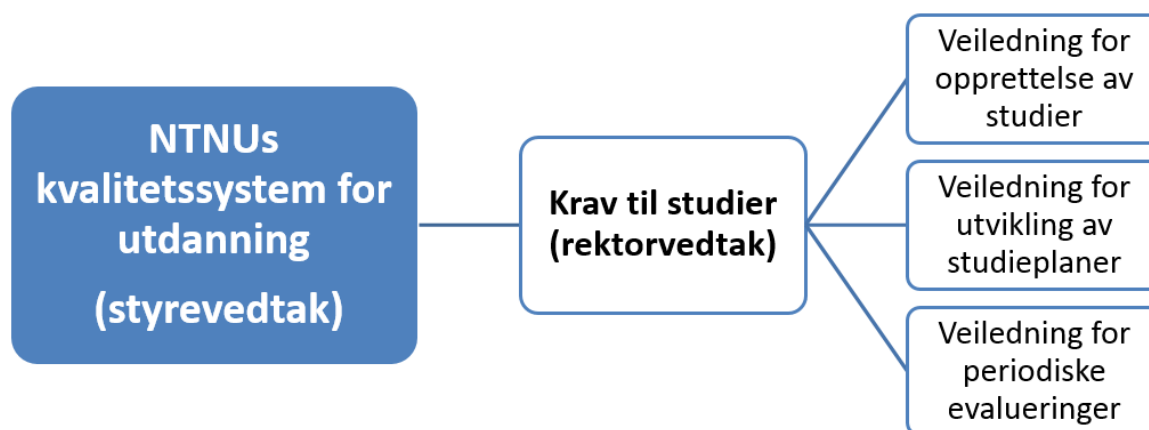
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Adopted by Rector June 2016

Amended by Rector March 2017

Introduction

The “Guide to developing programme descriptions and course descriptions at NTNU” (short version “Programme Description Guide”) provides supplementary information for the document “Requirements for programmes of study at NTNU”. The Programme Description Guide describes the process for developing programme descriptions and course descriptions, and it provides a table of contents with further details of both programme descriptions and course descriptions. The quality initiatives provide the basis for the programme description process.



[Text for diagram]

NTNU's quality system for education (Board resolution) of study

Requirements for programmes of study (Rector's decision)

Guide to establishing programmes

Guide to developing programme descriptions
Guide to periodic evaluations

The Programme Description Guide is founded on Section 4-1 third subsection and Section 4-2 of NTNU's Academic Regulations. The Programme Description Guide must be used for **all programmes of study**¹ that fall under the definition of a programme of study in Section 1-2 of the Academic Regulations:

“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.”

The chapter on course descriptions in the Programme Description Guide also applies to common courses. A course is defined in Section 1-2 of the Academic Regulations as “The smallest credit-bearing unit, in which the student receives an assessment and a final course grade”.

Purpose

Quality of education is a focus area for NTNU's activities. Through a standardized format for programme descriptions and course descriptions, the Programme Description Guide can contribute to improving the quality of education. A common specification of requirements for all study programmes makes it easier for students, applicants and external stakeholders to obtain and use information about courses and programmes of study at NTNU. It becomes easier for the programme councils and the departments to create programme descriptions and course descriptions when everyone uses the same

¹ This includes collaborative programmes, continuing and further education, established programmes of study, etc. Programme descriptions must be drawn up for all programmes and all courses in NTNU's academic portfolio.

template.

The Programme Description Guide is based on requirements in “[Forskrift om kvalitetssikring og kvalitetsutvikling i høyere utdanning og fagskoleutdanning](#) [Regulations on quality assurance and quality enhancement in higher education and vocational education]”² and “[Forskrift om tilsyn med utdanningskvaliteten i høyere utdanning](#) [Regulations concerning supervision of educational quality in higher education]”³.

The programme description is intended to clarify expectations between NTNU and the student, describing aspects such as expected learning outcomes, the normative requirements that NTNU sets, the estimated workload for the student during the programme, how learning is measured, and others.

The Norwegian Qualifications Framework and learning outcomes

In the Programme Description Guide, NTNU emphasizes the development of learning outcome descriptions, cf. the Norwegian Qualifications Framework (NQF), the European Qualifications Framework, and the Bologna Process. 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.

NQF specifies the learning outcome for a student in general terms when he or she has completed an education and been awarded a qualification (degree diploma). Learning outcomes must thus be interpreted as national requirements for *knowledge*, *skills* and *general competence*.

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 Appendix 1.

A learning outcome can be defined as what a person knows and is able to do as a result of a learning process. Learning outcomes are described in the form of knowledge, skills and general competence. The level of the learning outcome depends on the complexity of the knowledge, skills and general competence.

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. This must be specified in the formulation of learning outcome descriptions.

Process for developing programme descriptions and course descriptions⁴

The quality initiatives provide the basis for the programme description process. The process is clarified in NTNU’s annual cycle for the programme description process⁵. The programme description must be completed at the faculty by 1 April. It is important that the information NTNU presents in programme descriptions and course descriptions is as accurate as possible. For this reason, information on course descriptions and programme descriptions is not normally changed after it has been announced.

After the announcement (see the annual cycle), changes or adjustments to the learning outcomes for the programme and the course are not permitted. Other aspects that may not be changed are the name of the programme and the course, the number of credits in the programme or the individual course, forms of assessment for the programme or the course, or admission requirements in the study or the course, or admission requirements for the programme and the course. In addition, it is not

² Studiekvalitetsforskriften

³ Studietilsynsforskriften

⁴ The process map relates to the institutional level. Each faculty controls the approach to the process at the individual faculty.

⁵ The annual cycle is available at NTNU’s [web page on quality assurance of the portfolio of programmes of study](#)

possible to change the following in the course description: required previous knowledge, teaching semester, level, compulsory activities, credit reduction due to overlapping courses, language of instruction.

Changes in connection with procedural errors or other exceptional circumstances are made under the authority specified in the Programme Description Guide and cf. Section 4-2 of the Academic Regulations. A memorandum with the changes desired is to be sent to the Academic Administrative Division

For tentative allocation of roles in the programme description process, see Appendix 2.

The Programme Description Guide should be used when courses are developed and when programme descriptions are developed, completed and published. For new programmes of study, also see the document "Requirements for programmes of study at NTNU".

Laws and regulations

Programmes of study at NTNU must fulfil all the requirements of relevant laws and regulations, with accompanying supplementary rules. See Appendix 5 for the most important of these. In particular, see [Section 3-1 fourth subsection of NTNU's Academic Regulations](#) on students' entitlement to unchanged learning outcomes during their period of study.

The programme description

I Name of the programme of study

Section 2-2 first subsection of the Regulations on the Supervision of Educational Quality requires the programme of study to have an appropriate name. The Norwegian Agency for Quality Assurance in Education (NOKUT) points out that students must be able to understand what kind of programme they are admitted to, and that the name that is chosen must be consistent with the programme content. The name of the programme of study forms part of the agenda item submitted to the Board concerning the academic portfolio. The name of the programme of study appears on the diploma. The Rector may change the name; cf. Section 4-1 fifth subsection of the Academic Regulations.

The programme is given names in Norwegian Bokmål, Norwegian Nynorsk and English.

II Admission requirements

The requirements for admission must be described here, in close dialogue with admissions staff (in the Academic Administrative Division). Refer to the national regulations concerning admission to higher education 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 requirements are specified by 1 February so that they can be used in marketing the programmes of study.

If a certificate of good conduct from the police (politiattest) is required for admission, this must be described here⁶; cf. Section 3-8 of the Academic Regulations.

If a medical certificate or personal statement of health, vaccinations related to practical training or similar is required, this must also be described here. Specify the legal basis for this requirement.

⁶ <https://www.ntnu.no/studier/opptak/politiattest>

III Approved

Most recent date of approval or of the latest revision approved, with the name of the body that made the decision. Specify the year of admission from which the programme description applies.

IV Introduction, including national curriculum reference

Brief presentation of the programme, specific characteristics of the programme, distinctive features that should be highlighted in brief. The text may be used in external links to the NTNU website.

For programmes of study with national curriculum regulations, or a curriculum recommended by the Norwegian Association of Higher Education Institutions (UHR), with national guidelines, include a link to the applicable regulations as a reference.

For programmes of study where an inter-faculty executive committee approves the programme description, include a link to the guidelines from the relevant committee.

V Learning outcomes

See Section 2-2 first subsection of the Regulations on the Supervision of Educational Quality: *“The learning outcome for the programme of study must be described in accordance with the Norwegian Qualifications Framework for Lifelong Learning”* with Comments on Section 2-2 first subsection *“Learning outcomes must be described as what a graduate must have achieved on completion of the programme. The learning outcome for programmes with professional requirements, such as programmes with a curriculum framework, must meet both professional requirements and the requirements of the Norwegian Qualifications Framework for Lifelong Learning (NQF)”*

Also refer to Section 2-2 fourth and fifth subsection of the Regulations on the Supervision of Educational Quality. The learning outcome descriptions must be unique to the individual programme of study.

Learning outcomes must be described both in the programme description and in each course description. The learning outcome descriptions must specify what NTNU expects the student to master and the knowledge, skills and general competence that the student should possess after completing the programme. Learning outcomes must be specified within the dimensions of knowledge, skills and general competence.

Learning outcome descriptions must not be prepared for partially completed programmes of study, such as the first year of study.

Any national requirements within the subject area must be concretized 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 education.** See Appendix 4 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 outcomes.

There must be a clear progression in the learning outcomes for the courses that are included in the programme of study. See Appendix 2 for taxonomies.

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

The descriptions of the learning outcomes for the programme of study must be stated on the diploma. It is therefore very important to present learning outcomes briefly and precisely.

Formulation of learning outcomes⁷:

- Write a limited number of outcome descriptions for each area. For the programme of study, the Qualifications Framework or national curricula may provide an outline
- 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 ...*”
- 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 critical in connection with learning outcomes related to skills.

NTNU’s graduates must be characterized by knowledge of their discipline, greater curiosity than they had when they started their studies, and good 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.

VI Duration, scope and level

The following must be specified:

- i) The formal degree obtained; see the Regulations relating to degrees and vocational training, protected titles and nominal length of study at universities and university colleges, including Circular 09/5346 dated 21 December 2015 from the Ministry.
- ii) The number of years prescribed for the nominal duration of the programme and whether it is a part-time- or full-time programme. Credits.
- iii) Host faculty for the programme of study and (if applicable) the host department
- iv) Estimated workload for the programme per week and/or per academic year⁸.

The Norwegian academic year is specified as 10 months, cf. Section 3-8 first subsection of the Universities and University Colleges Act.

⁷ Examples of relevant literature: Kennedy, Hyland, Ryan: Writing and Using Learning Outcomes - a Practical Guide (http://www.tcd.ie/teaching-learning/academic-development/assets/pdf/Kennedy_Writing_and_Using_Learning_Outcomes.pdf); Sandi Osters: Writing Measurable Learning Outcomes (<http://www.gavilan.edu/research/spd/Writing-Measurable-Learning-Outcomes.pdf>); or Tine S Prøitz’s Læringsutbytte [Learning outcomes] (Universitetsforlaget 2015).

⁸ Guidelines from the European Higher Education Areas Ministerial Meeting in 2015: “*Workload is an estimation of the time the individual typically needs to complete all learning activities such as lectures, seminars, projects, practical work, work placements and individual study required to achieve the defined learning outcomes in formal learning environments. The correspondence of the full-time workload of an academic year to 60 credits is often formalised by national legal provisions. In most cases, workload ranges from 1,500 to 1,800 hours for an academic year, which means that one credit corresponds to 25 to 30 hours of work*” cf. ECTS Users’ Guide 2015 http://ec.europa.eu/education/library/publications/2015/ects-users-guide_en.pdf

The basis for programme descriptions 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 academic year)
- One -1- week's work corresponds to about 1.5 credits
- A course worth 7.5 credits corresponds to about 5 weeks of work.

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 the basis of this, 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.

v) The level of the programme in terms of the step-by-step 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.

VII Programme structure

The following must be specified:

- Summary of courses in the programme of study – show the progression clearly
- 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 of study; 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
- Common courses such as Experts in Teamwork, ex.phil (Examen philosophicum) and ex.fac (Examen facultatum), and perspective courses
- Programme options (profile). Specify when the programme option is chosen. Describe the programme options. The programme option / specialization must lead to the overarching learning outcome for the level of study.

VIII Learning methods

See Section 2-2 fifth subsection of the Regulations on the Supervision of Educational Quality [studietilsynsforakriften].

The learning methods must be adapted to the expected learning outcome for the programme of study. Provide reasons for this in brief. For programmes based on group sessions and online study, this aspect must be described in greater detail.

IX Forms of assessment

See Section 2-2 fifth subsection of the Regulations on the Supervision of Educational Quality.

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. Good variation in forms of assessment is also a clear expectation from the Norwegian Agency for Quality Assurance in Education (NOKUT). Brief rationale for the combination of forms of assessment.

X Internationalization⁹

See Section 2-2 seventh and eighth subsections of the Regulations on the Supervision of Educational Quality .

All NTNU graduates must have acquired international competence that is relevant to the subject area. In the programme description, this must be highlighted through the description of the learning outcome, in forms of work and teaching methods, by bringing international perspectives on the subject area into the learning situation, as well as having schemes for student exchange.

The semester that is best suited to student exchange should also be specified here, as well as a rough overview of which institutions or in which countries there are exchange agreements, and how international perspectives are brought into the programme of study.

XI Entrepreneurship and innovation

NTNU's strategy for 2011-2020 Knowledge for a better world¹⁰ describes innovation and creativity as key elements in NTNU's operations. This should be described briefly through the programme description.

XII Professional and occupational prospects / further study

See Section 2-2 second subsection of the Regulations on the Supervision of Educational Quality .

A description must be provided of how the programme of study is academically relevant to working life with specific examples of possible careers.

Provide specific examples of possible further study at NTNU, and subject areas with programmes of study at other institutions.

XIII Practical training

See Section 2-2 ninth subsection of the Regulations on the Supervision of Educational Quality: "For programmes of study with practical training, agreements on practical training must exist between the institution and the placement organization".

Here, the programme description outlines the scope and organization of the practical training, as well as other relevant information about the practical training.

XIV Requirements for suitability

If the programme is subject to suitability assessment¹¹, this must be made clear here; see Section 3-6 of the Academic Regulations. Briefly describe the suitability assessment throughout the programme and link to NTNU's web page on suitability assessment.

XV Special requirements and conditions

⁹ Report to the Storting No. 14 (2008-2009) *Internasjonalisering av utdanning [Internationalization of Education]* describes internationalization of education as an exchange of ideas, knowledge, goods and services between countries across established national borders, which has the individual country as its point of view and perspective. Within education, internationalization involves including a global dimension in goals, organization and actions; see also NTNU's [International Action Plan 2014-2017](#).

¹⁰ <https://www.ntnu.no/ntnu-2020>

¹¹ <https://innsida.ntnu.no/wiki/-/wiki/Norsk/Skikkethetsvurdering>

If special requirements for technology apply to participation in the programme, these must be specified. This might be special software or requirements for computers / hardware¹². Other prerequisites might be a requirement that the student is employed and working actively in the context of his or her own workplace.

XVI Other relevant information

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 here.

¹² See the letter from the Ministry of Education and Research dated 28 June 2016 (in Norwegian) in which the possibility to require students to have their own laptop computer is described in more depth.

Course descriptions

I Course name

The name of the course must reflect the main content of the course and be unique to the course. The course name must exist in both forms of the Norwegian language as well as in English. The course code is assigned according to the rules for coding, and is determined centrally in the organization.

II Credits

Specify the scope of the course in credits.

III Learning outcomes

The description of learning outcomes at course level must 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 other courses are primarily focused 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.

There is no requirement in the Norwegian Qualifications Framework or national curriculum regulations that the individual learning outcome at course level must be achieved as a prerequisite for 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. NTNU's mission is to pave the way for students to achieve the learning outcome through relevant and customized learning methods and forms of assessment. We must ensure that we can measure and grade the learning outcomes that students have actually achieved. If one states that students should be able to exercise a skill, teaching and assessment must be designed to enable the student to practise this and achievement of the learning outcome must be documented. This is a key factor in connection with learning outcomes related to skills.

Use active verb forms with an explicit subject. "The candidate understands", not "it is understood"

In the design of learning outcomes at course level, it is important to emphasize that there should be visible progression through the course of study.

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. 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.

IV Level

Specify the level of the course; see the stages of the NQF cycles¹³ with cycle 1, cycle 2 or cycle 3.

V Teaching semester:

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

¹³ <http://www.nokut.no/no/fakta/det-norske-utdanningssystemet/nasjonalt-kvalifikasjonsrammeverk-for-livslang-laring/nivaer/>

VI 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. Compulsory activities follow the requirements for answer papers; see Section 5-8 sixth subsection of the Academic Regulations.

VII 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 this course and/or to 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 if the required previous knowledge also applies to starting the course.

Specify whether admission to the course is restricted. The decision is made by the Rector. Specify whether the course is reserved for students admitted to a particular programme of study.

VIII Recommended previous knowledge

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

IX Academic content

Briefly specify the topic of the course. The topic must be linked with learning outcomes for the course.

X Learning methods

Indicate which learning methods and learning activities are used in the course and link them to the learning outcome; see Section 2-2 fifth subsection of the Regulations on the Supervision of Educational Quality . Learning methods must be designed in such a way that learning outcomes can be achieved.

XI Compulsory activities

Compulsory activities are organized to support the student's learning process. Compulsory activities must be approved before a student can register for assessment or take the examinations; this must be made clear here. Compulsory activities must not be included in the assessment basis itself.

The compulsory activities must be described in an exhaustive list. For example reports, exercises, excursions, papers, placements, business internships, laboratory exercises, etc. These are assessed as pass/fail and must be passed as a prerequisite for the student to attend the examination. When compulsory attendance is used, alternative activities that can compensate for any lack of attendance should be described.

XII Form of assessment and grading scale¹⁴

Specify which forms of assessment are used in the course. Specify the duration¹⁵ of the assessment. Specify the percentage weighting of the component assessments.

The following must be clarified:

- Specify whether the form of assessment may be changed if the examination is rescheduled; see

¹⁴ Norwegian Council for Higher Education (UHR) on determination of grades

http://www.uhr.no/ressurser/temasider/karaktersystemet_1/karaktersystem_og_retningslinjer

¹⁵ For example : Three-hour written or two-week take-home examination.

Section 5-6 first subsection of the Academic Regulations.

- Specify which component assessments must be repeated if students do not pass the course, or whether all component assessments must be repeated, cf. Section 5-6 third subsection of the Academic Regulations
- Specify 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 fourth subsection 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 here whether an appeal against the grade can be made after the separate component assessment; see Section 6-2 seventh subsection of the Academic Regulations
- If the form of assessment is other than a written examination, cf. Section 5-6 second paragraph of the Academic Regulations, specify how rescheduled examinations will be organized (applies to rescheduled examinations in connection with legitimate absence).

An exhaustive and precise list of permitted examination aids must be created. 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 clarified.

For a practical course where completion of the course is to be regarded as the form of assessment, it must be stated whether it is possible to apply for a third attempt in the course; see Section 5-10 of the Academic Regulations. Unless this is made clear, there is no such possibility.

The extent to which the student has achieved the learning outcomes¹⁶ is determined based on evaluation of individual performance and use of the grading scale. The basis for the assessment is the overarching qualitative descriptions of the individual grade symbols (see Section 5-1 of the Academic Regulations). Section 5-1 seventh subsection of the Academic Regulations states that the faculties must provide descriptions of the assessment criteria that are specific to each subject.

XIII Credit reduction due to overlapping courses

Specify the credit reduction due to overlapping courses that follows from the relationship between the course and other courses.

XIV Course coordinator

Specify the course coordinator.

XV Responsible unit

Which department and faculty are the responsible units for the course?

XVI Other relevant information

¹⁶ Such grading of learning outcomes is done only at course level.

Appendix 1 The Norwegian Qualifications Framework and learning outcomes

NQF's table for learning

outcomes 1st cycle

Kunnskaper [Knowledge] (K), Ferdigheter [Skills, capacities] (F) and General	
NQF	[Programme name]
The candidate:	The candidate:
1K1	has broad knowledge of key topics, theories, issues, processes, tools and methods in the subject area
1K2	is research and development work in the subject area familiar
1K3	can update his or her knowledge within the subject area
1K4	has knowledge of the subject area's history, traditions, distinctive character and place in society
1F1	can apply academic knowledge and relevant results from research and development work on practical and theoretical issues and make well-founded choices
1F2	can reflect on his or her own academic practice and adjust this under academic supervision
1F3	can find, assess, and cite information and academic material and present this in a way that sheds light on the problem at hand
1F4	can master relevant tools, techniques and forms of expression in the discipline
1G1	has insight into relevant disciplines and issues of professional ethics
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
1G3	can convey key academic material such as theories, problem formulations and solutions, in writing, orally and through other relevant forms of expression
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
1G5	is familiar with innovative thinking and innovation processes

2nd cycle

Kunnskaper [Knowledge] (K), Ferdigheter [Skills, capacities] (F) and General	
NQF	[Programme name]
The candidate:	The candidate:
2K1	has advanced knowledge within the academic field and specialized insight in a limited area
2K2	has thorough knowledge of the scholarly or artistic theories and method in the field
2K3	can apply knowledge to new areas within the academic field
2K4	can analyse academic problems on the basis of the history, traditions, distinctive character and place in society of the
2F1	can analyse and deal critically with various sources of information and use them to structure and formulate scholarly arguments

2F2	can analyse existing theories, methods and interpretations within the subject area and work independently on practical and theoretical problem solving	
2F3	can use relevant methods for research and academic and/or artistic development work in an independent	
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 ethics	
2G2	can apply his/her knowledge and skills in new areas in order to carry out advanced assignments and projects	
2G3	can communicate extensive independent work and masters language and terminology of the academic field	
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	

3rd cycle

Kunnskaper [Knowledge] (K), Ferdigheter [Skills, capacities] (F) and General	
NQF	[Programme name]
The candidate:	The candidate:
3K1	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
3K2	can evaluate the appropriateness and application of different methods and processes in research and scholarly and/or artistic development projects
3K3	can contribute to the development of new knowledge, new theories, methods, interpretations and forms of
3F1	can formulate problems in, plan and carry out research and scholarly and/or artistic development work
3F2	can carry out research and scholarly and/or artistic research work of a high international standard
3F3	can handle complex academic issues and challenge established knowledge and practice in the field
3G1	can identify new relevant ethical issues and carry out his/her research with scholarly integrity
3G2	can manage complex interdisciplinary assignments and projects
3G3	can communicate research and development work through recognized Norwegian and international channels
3G4	can participate in debates in the field in international forums
3G5	can assess the need for, initiate and practice innovation

Appendix 2 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)

COGNITIVE LEVELS Examples of verbs that can be used in learning goals for knowledge (in the cognitive domain)			
REMEMBERING ("lowest")	Recognize Reproduce Recall	Define Describe Refer Label	List Identify Present Underline
UNDERSTANDING	Rewrite Explain	Interpret Show Predict Formulate	Specify (dis)similarities Translate Denote Solve
APPLICATION	Predict Select Explain Use	Construct Discover Compute Apply	Register Organize Demonstrate Tell (in their own words)
ANALYSIS	Analyse Infer Break down Find out	Select Confirm Separate Investigate	Account for Classify Identify Compare
SYNTHESIS	Combine Relate Derive Suggest Select	Refine Plan Summarize Document	Generalize Organize Formulate rules Draw conclusions
EVALUATION ("highest level")	Assess Appraise Debate Discuss Conclude	Defend Decide Research Justify Make decisions	Compare value Differentiate between Accept/reject Criticize

Skills objectives

Often called psychomotor objectives (Simpson's taxonomy)

PSYCHOMOTOR LEVELS Examples of verbs that can be used in learning objectives for skills (in the psychomotor domain)			
PERCEPTION ("lowest")	Detect, focus, recognize, register	See, hear, listen, smell, taste, observe, keep track of	Pay attention, observe, be aware of, receive (impressions)
READINESS TO ACT	Prepare, focus, participate, follow	Show interest, touch/use, decide/choose, act/get	Expect, make up one's mind to, prefer, concentrate on, state/declare
IMITATION AND TRIAL AND ERROR	Imitate, mimic, copy, repeat	Attempt, try out, initiate, follow	Lift, tighten/fasten, loosen, handle/treat, choose (correctly)
HABITUAL ACTION	Undertake, adapt, distinguish, adjust, use, apply	Master, measure, assemble, correct errors, perform, do	Set (adjust), choose (among), maintain, persevere, complete
COMPLEX SKILLS	Make, construct, create, process, produce	Carry out, repair, dismantle/assemble, form, distinguish	Assemble, exert power, demonstrate speed, precision,
REFINED AND DEVELOPED SKILLS ("highest level")	Improvise, combine, complete, master	Change, vary, improve, repair, renew	Master, develop

Attitudinal objectives

(Krathwohl’s taxonomy). Often called affective objectives. Note that the concept of “General competence” in the Qualifications Framework is broader than attitudes.

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

Appendix 3 Allocation of roles in the programme description process¹⁷

This appendix discusses the process towards the decision on the programme description. Section 4-2 of the Academic Regulations describes the power of decision for the programme description. Responsibility for the study planning process cannot be delegated, but the tasks may be delegated. There may be variations in the programme description process, because the governing body has authority here, among other reasons.

Party	Responsibilities and tasks
Board	The Board decides on the establishment and discontinuation of programmes of study (60 credits or more); see Section 4-1 of the Academic Regulations.
Rector	The Rector decides on programmes of study for the Master of Science in Engineering programmes and the five-year teacher education programmes. The Rector has delegated this authority to FUS and FUL respectively.
	The Pro-Rector has special responsibility for strategy and management within the area of education, including development and maintenance of routines and procedures for quality in education. The Pro-Rector assists the faculties in the programme description work; helps in quality assurance of programme descriptions with regard to fulfilling key requirements and guiding principles, students' rights, ensuring that formal conditions related to systems for assessment are taken care of and that the programme description is designed within feasible limits within the Pro-Rector's areas of responsibility (for example, admission and examinations)
Education Committee	A strategic advisory committee for the Rector, which advises the Rector in the academic portfolio process Part 1 and Part 2. This applies only to the development of new programmes of study.
Dean	The faculty approves the programme descriptions for the programmes of study that the faculty manages ¹⁸ ; see Section 4-2 of the Academic Regulations. The Dean has the overall responsibility for the faculty's academic activities. This also implies that the programme description process takes place in accordance with overarching rules and guiding principles, within given time limits.

Each faculty may have variations in the development process below the faculty level in the distribution of roles	
Department-Chair	The Head of Department must ensure that quality assurance of the department's courses is performed in accordance with NTNU's requirements. The Head of Department is responsible for the range of courses that the department offers, including through personnel responsibility and financial responsibility at the department.
Study programme coordinator ¹⁹	The study programme coordinator (SPL) most contribute to the quality of a programme of study. The study programme coordinator develops proposals for and revisions of the programme description for the programme of study where the person in question is responsible for developing the academic content, profile and relevance of the programme of study. The study programme coordinator is responsible for coordination efforts to ensure that the programme description complies with overarching guiding principles and that the course descriptions individually and collectively contribute to achievement of the learning outcomes in the programme description. The coordination efforts must involve both the course coordinators and the study programme council.

¹⁷ May be changed according to the role description for the Dean in relation to <https://innsida.ntnu.no/wiki/-/wiki/Norsk/Ledelse+av+studieprogram#section-Ledelse+av+studieprogram-Fakultetsinterne+studieprogram>

¹⁸ The Executive Committees at NTNU also manage programmes of study.

¹⁹ The study programme coordinator reports to the Dean or to the Head of Department, depending on how the tasks related to the programme description process have been delegated. Where the study programme coordinator reports to the Head of Department, follow-up can also be carried out by the Head of Department.

Course coordina tor	The course coordinator is responsible for ensuring that the description of the course is drawn up in accordance with the overarching learning outcome for the programme of study. In cooperation with the academic environment, the course coordinator is responsible for drawing up the course description in accordance with the guiding principles in effect. For example, the course coordinator specifies the form of assessment, but the study programme coordinator is responsible for use of a variety of assessment forms in the programme and therefore has the opportunity to provide input.
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Appendix 4 Combined learning outcomes for the programme of study distributed by course in the programme

<PROGRAMMES OF STUDY>																		
Programme's learning outcomes (K=Knowledge, F=Skills [<i>Ferdighet</i>], G=General competence)	Programme's courses and which learning outcomes at programme level the courses help to fulfil																	
	Course 1	Course 2	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
K-1																		
K-2	X		X	etc.														
K-3		X	X															
K-4			X															
K-5																		
F-1																		
F-2																		
F-3																		
F-4																		
F-5																		
G.1																		
G.2																		
G.3																		
G.4																		
G.5																		

Appendix 5 Laws and regulations

A list of the key regulations for work with the Programme Description Guide appears below. Also see NTNU's website for [laws and regulations](#).

- [Lov om universiteter og høyskoler \[Universities and University Colleges Act\]](#)
- [Forskrift om studier ved Norges teknisk-naturvitenskapelige universitet \(NTNU\) \[Academic Regulations for the Norwegian University of Science and Technology \(NTNU\)\]](#)
- [Forskrift om grader og yrkesutdanninger, beskyttet tittel og normert studietid ved universiteter og høyskoler \[Regulations relating to degrees and vocational training, protected titles and nominal length of study at universities and university colleges\]](#)
- [Forskrift om krav til mastergrad \[Regulations concerning Requirements for Master's Degrees\]](#)
- [Forskrift om godskriving av høyere utdanning \[Regulations relating to the recognition of higher education\]](#)
- [Forskrift om kvalitetssikring og kvalitetsutvikling i høyere utdanning og fagskoleutdanning \[Regulations on quality assurance and quality enhancement in higher education and vocational education\]](#)
- [Forskrift om tilsyn med utdanningskvaliteten i høyere utdanning \(studietilsynsforskriften\) \[Regulations concerning supervision of educational quality in higher education\]](#)
- [Norwegian qualifications framework for higher education](#)
- [Forskrift om opptak til universiteter og høyskoler \[Regulations relating to admission to studies at universities and university colleges\]](#)
- [National curriculum regulations for higher education](#)