

Årsrapport fra programsensor

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Programsensor ved

- fakultet: *Det samfunnsvitenskapelig fakultet, UiB*
- studieprogram: *Bachelorprogram i kognitiv vitenskap*

Oppnevnt for perioden: *2018 – 2021*

Denne rapporten gjelder perioden: *kalenderåret 2019*

SUMMARY

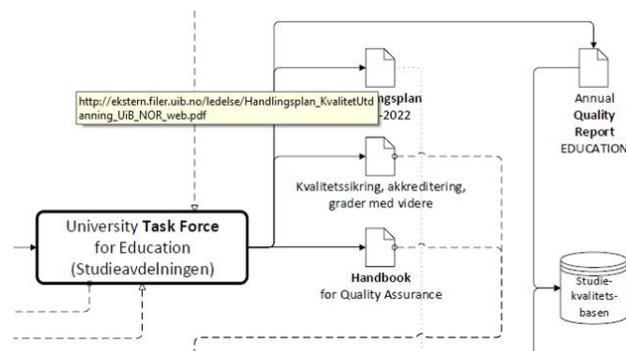
UiB's strategy plan states the following:

*Through a wide range of study programmes, UiB educates students to **actively contribute to a society** based on knowledge, expertise and democratic values. Knowledge, **critical reflection and personal development** are hallmarks of our educational programmes. We recognise the value of high-quality education and develop innovative teaching methods which generate **positive learning outcomes** by giving students an early insight into research and collaboration. New challenges provide opportunities for complex solutions harnessing perspectives and methodologies from **multiple disciplines**. We educate the problem-solvers and critical voices of the future.*

The KogVit study programme has a clear ambition actively to contribute to society, and several courses, as supported by courses of more theoretical/methodological/foundational nature, are very oriented towards good practices. Students are expected critically to reflect, in particular when studies as well as examinations are set up in a way to promote such reflections connected with personal development. Education is high-quality, and student at least equally so high-quality performers. Learning outcomes are clearly positive. KogVit programme **has a well-defined and structured instrument for student and teacher self-evaluations, but enriching the feedback loop involving measurement should add further value to quality reporting on all levels**. KogVit might indeed want to engage in developing such enriched metrologies for outcomes measurement and feedback looping, thus providing further strengthening and deepening of its multiple disciplinarity. This is important also more generally concerning enriched quality assurance processes within UiB.

You, UiB, indeed educate problem-solvers and critical voices of the future, and **you could even prove it more precisely!** Engaging in process oriented outcomes measurement needs to originate from specific programmes, and KogVit (among other programmes) appears to possess appropriate culture and structure to further promote and develop such measurements. The structure e.g. of examination systems and programme quality assurance reporting is excellent. Data related with examinations is effectively managed. Feedback loops can be identified. Instrumentation for the collection of quality assurance data can be further developed. Teaching methods are clearly innovative, but the education programme structure seem not yet fully capable of making use of innovations in teaching. This is seen e.g. when looking at how requirements (forkunnskapar) for courses are described. Courses are related, course are laterally and horizontally dependent, but these relations and dependencies are still not all that well reflected in description of courses within the programme, in particular in its specializations.

While reading whole document, the reader is advised every now and then to have a look at the overall process view of UiB education as the outlined at the end of this document. If reading the report as a pdf file on a computer, document links are available under document icons.



Content:

1. **Cognitive Science - What is it? What can I do with it?**
2. **The programme as a whole and in parts**
3. **Quality assurance**

Links and background material provided for this 2019 reporting:

Hovedside Kogvit-program

<https://www.uib.no/studier/BASV-KOGNI>

<https://www.uib.no/en/studies/BASV-KOGNI>

The Kogvit programme is taught in Norwegian and students must document Norwegian language proficiency to be considered for admission. The programme description is only available in Norwegian.

Karakterfordeling våren og høsten 2019

Background information and files provided to the ‘programsensor’:

De studentene som begynte på KOGVIT høsten 2019 følger ny studieplan, og der er KOGVIT101 i 1. semester. Mens de som går på studieplan for 2018 tok KOGVIT i sitt 2. semester, altså våren 2019.

KOGVIT101 h19, KOGVIT101 v19, INF100 h19, EXFAC00SK h19, LOG110 v19, LOG111 v19, FIL105 v19, PSYK120 v19, INFO102 v19, LING122 h19, INFO282 h19, INFO283 h19, DASPSTAT h19, INF227 v19

Karakterfordeling på informasjonsvitenskaplige emner, relevant mht de som spesialisierer seg i infovit.

INFO103 v19, INFO110 v19, INFO115 h19, INFO116 h19, INFO125 h19, INFO207 h19, INFO212 h19, INFO216 v19, INFO233 v19, INFO262 v19, INFO284 v19

Karakterfordeling på informatikk emner, relevant mht de som spesialisierer seg i informatikk.

INF102 h19, INF112 v19, INF122 h19, INF223 v19, MAT111 h19, MAT121 v19

Karakterfordeling på filosofi emner, relevant mht de som spesialisierer seg i filosofi.

No data provided.

1. Cognitive Science - What is it? What can I do with it?

What is it?

Programme website description:

The programme has its focus on capabilities of the human brain. Students will learn how humans reflect upon and react to everyday events, how humans understand language, as part of being in the world around us. Students will also learn about formal logical tools to represent and apply knowledge. Skills are related to these conceptual and formal parts then enable student e.g. to create computer programs and systems building upon artificial intelligence, gamification, mobile technology, and in general solutions that support upholding of human health and well-being¹.

What can I do with it?

The Programme main website includes a section on “Jobb”:

Gjennom studiet i kognitiv vitenskap vil du tileigne deg både ein yrkesrelevant IT-kompetanse og ei akademisk evne til kritisk analyse og nytenking, ein kombinasjon som er svært etterspurt på arbeidsmarknaden. Fleire av våre tidlegare studentar jobbar med kunstig intelligens, språkteknologi, data science, programmering, systemdesign, brukarinteraksjon og produkt- og forretningsutvikling.

This is a very promoting and encouraging section. It is also notable to see how a former UiB student (Kristian Ellingsen Aamodt) underlines the importance of problem solving:

Jeg har fått bruk for det jeg lærte om systemer og databaser og lignende, men kanskje det viktigste er det man lærer på universitet om å angripe problemer. Det var mye oppgave- og problemløsning på studiet, og det er det på jobb også.

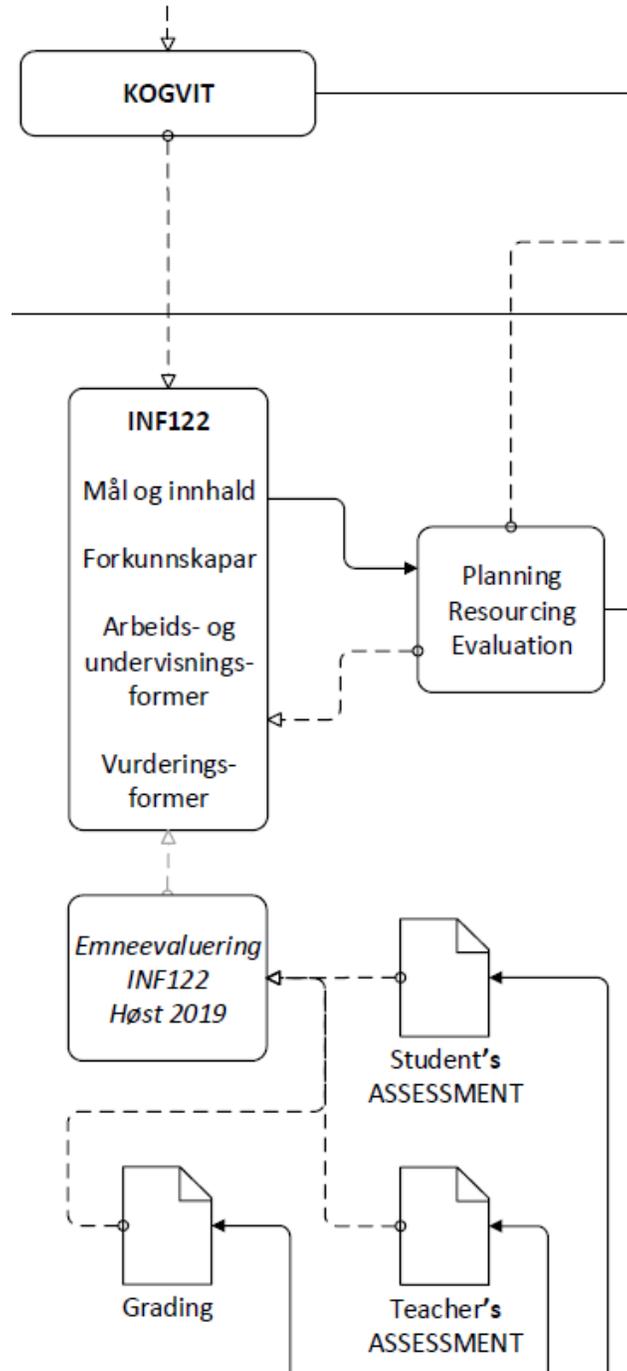
Problem solving relates to the challenge of providing humans with skills they didn't need before, which in turn, as mentioned in the 2018 report, is where Cognitive Science is essentially different from Artificial Intelligence.

¹ On the website it reads more specifically ”og program som støttar medisinsk diagnose”, i.e., *programs and digital solutions that support medical diagnostics.*

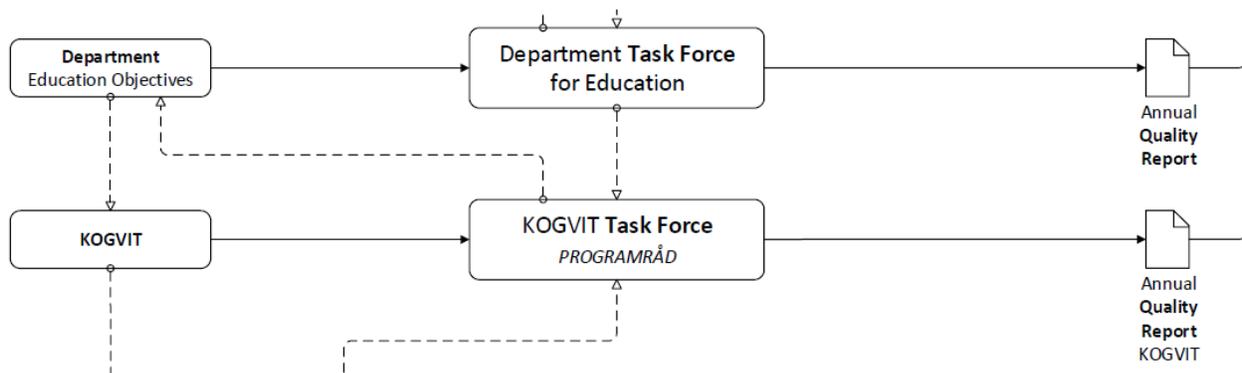
2. The programme as a whole and in parts

2.2. The programme as a whole

The programme consists of its structure and contents. A quality assurance process is additionally connected with the programme.



The KOGVIT programme is monitored as supported by its PROGRAMRÅD.



The programme in its basic part proceeds semester by semester over two years, four semesters, each semester being 30 SP. As observed in the report for 2018, the basic part of the programme can be seen as consisting of four groups of courses with the KOGVIT101 as a dedicated course specific for the programme as whole:

- cognitive science (KOGVIT101)
- psychology and philosophy of mind and cognition
- IT and AI, analytics, knowledge representation and computing
- language
- mathematics and logic

Specializations are available in

- informasjonsvitenskap
- informatikk
- filosofi

each covering 60 SP. The programme structure is shown in Fig. 1. If a course is prerequisite (forkunnskap) to another, then it is given as required (krav) or recommended (tilråd).



The basic courses in the present programme for Spring and Fall 2019, and their prerequisite dependencies, is largely the same as for 2018, with some additions with respect to prerequisite. Dependencies are shown in Fig. 1.

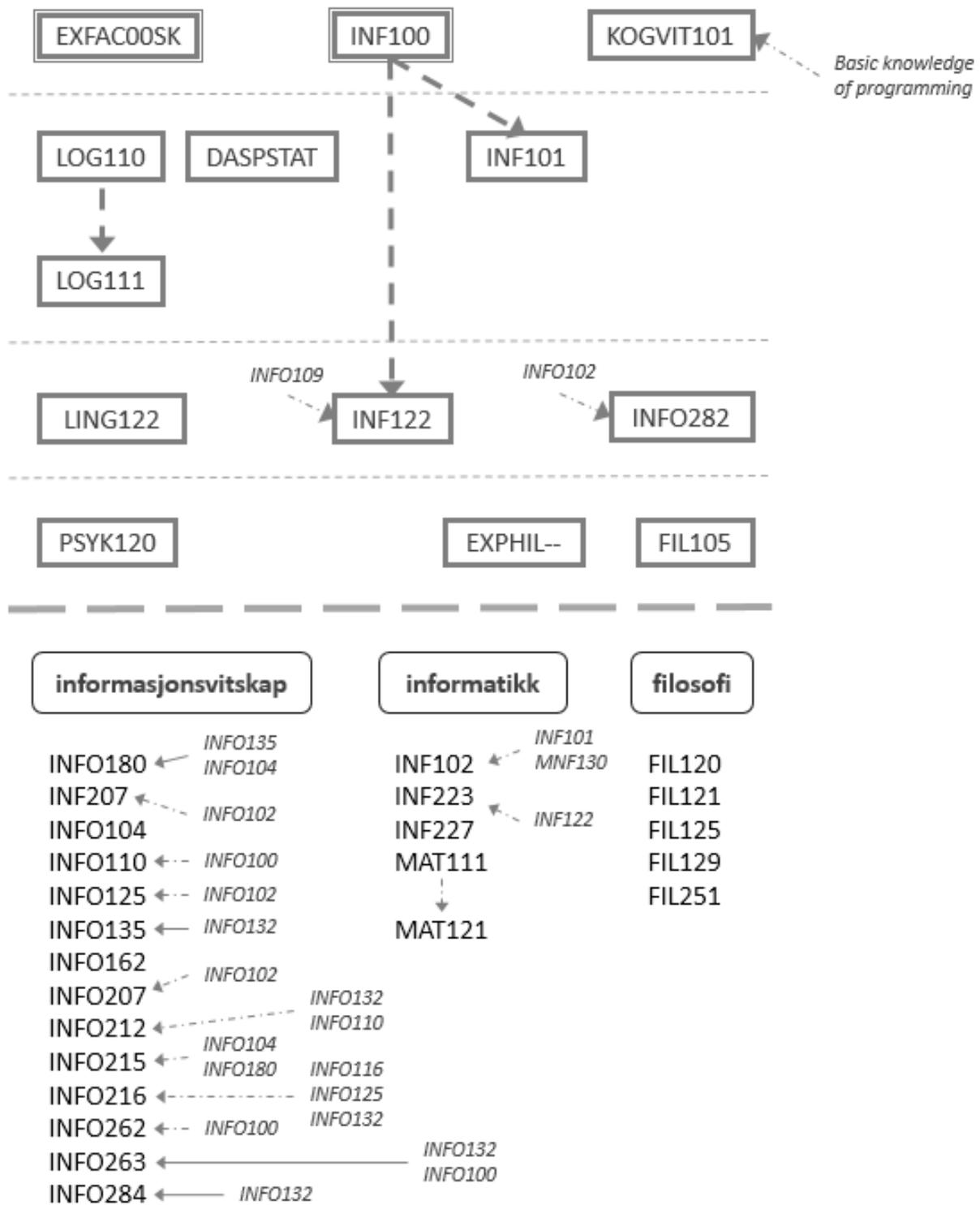
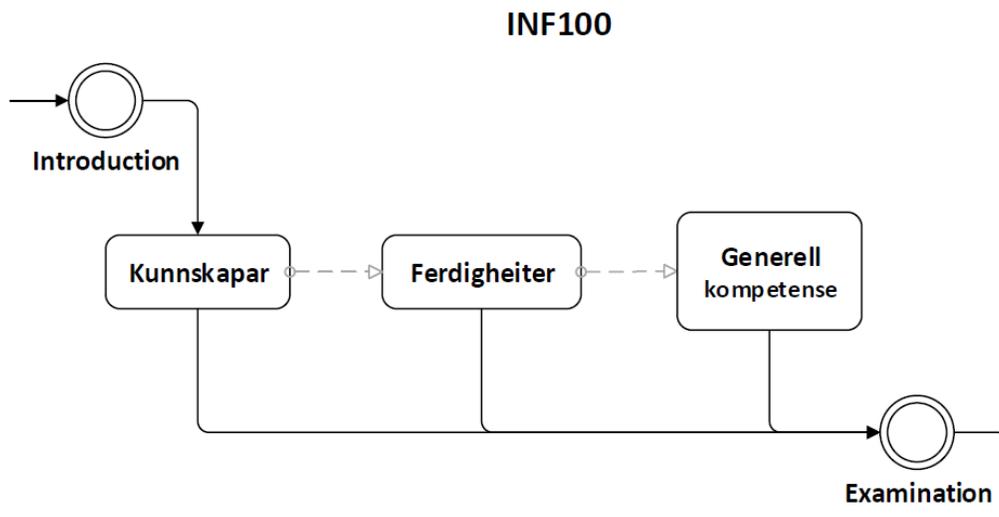


Fig. 1. Basic and specialized courses in the present programme during semesters 1-4 and 5-6.

The dependency and hierarchy of courses, given prerequisites for courses, is not all that clear. As a consequence, a recommended or standard study flow, in the best of ways enriching the overall competence in Cognitive Science, is not immediately identifiable.

2.3. The programme in parts

Detail concerning the programming and its parts was discussed in the 2018 report. There are no large or drastic changes to course content in the programme for 2019. Course descriptions are typically quite general and administrative. Common to most descriptions is the flow from theory to practice, providing a general competence.



Looking at gradings of courses, KOGVIT students have again performed well in comparison to students in other programs.

| Course | Cognitive Science students | | | ALL students in the course | | |
|---|----------------------------|-------|------------|----------------------------|-------|------------|
| | Eks. meldt | Best. | Snitt kar. | Eks. meldt | Best. | Snitt kar. |
| EXFAC00SK | 27 | 22 | C | 416 | 270 | C |
| INF100 | 36 | 27 | C | 559 | 427 | C |
| KOGVIT101 v19 | 29 | 22 | B | 68 | 54 | C |
| KOGVIT101 h19 | 31 | 24 | B | 77 | 60 | C |
| LOG110 | 27 | 26 | B | 106 | 78 | C |
| LOG111 | 26 | 20 | C | 33 | 23 | C |
| DASPSTAT | 21 | 20 | B | 30 | 26 | B |
| INF101 | | | | | | |
| LING122 | 22 | 21 | B | 53 | 46 | B |
| INF122 | 9 | 7 | B | 186 | 123 | C |
| INFO282 | 28 | 18 | C | 47 | 28 | D |
| PSYK120 | 28 | 20 | C | 28 | 20 | C |
| FIL105 | 29 | 27 | C | 50 | 36 | C |
| Spesialisering i informasjonsvitenskap | | | | | | |
| INFO180 (mand.) | | | | | | |
| INF207 | | | | | | |
| INFO104 | | | | | | |
| INFO110 | 4 | 4 | B | 168 | 133 | C |
| INFO125 | 4 | 4 | B | 204 | 188 | C |
| INFO135 | | | | | | |
| INFO162 | | | | | | |
| INFO207 | 3 | 3 | C | 47 | 33 | C |
| INFO212 | 3 | 3 | B | 61 | 54 | B |
| INFO215 | | | | | | |
| INFO216 | 2 | 2 | B | 26 | 19 | C |
| INFO262 | 5 | 5 | B | 123 | 112 | C |
| INFO263 | | | | | | |
| INFO284 | 3 | 2 | B | 95 | 73 | C |
| Spesialisering i informatikk | | | | | | |
| INF102 | 8 | 6 | C | 239 | 148 | C |
| INF223 | 0 | 0 | | 12 | 11 | C |
| INF227 | 27 | 20 | C | 46 | 33 | C |
| MAT111 | 4 | 3 | D | 438 | 250 | C |
| MAT121 | 2 | 2 | C | 327 | 220 | C |
| Spesialisering i filosofi | | | | | | |
| FIL120 | | | | | | |
| FIL121 | | | | | | |
| FIL125 | | | | | | |
| FIL129 | | | | | | |
| FIL251 | | | | | | |

Table 1. Courses, throughput and grades (2019) for 'Innføringsemne (krav 20 SP)' and 'Fagemner i kognitiv vitenskap (krav 90 SP)', as well as for 'Val av spesialisering (krav 60 SP)'.

For LOG110, 'Best' is almost equal to 'Eks. meldt' for Cognitive Science students, and 'Snitt kar.' is very good. For LOG111, 'Best' is still quite good, where Cognitive Science students populate this course very well. For DASPSTAT, 'Best' again almost equal to 'Eks. meldt', and Cognitive Science students populating the course. INF122 is functional programming and using Haskell, which is specialty in computer science. Here it may happen that only computer science and programming oriented Cognitive Science students attend this course, and when they do, they perform in very well, and better than BAMN-DTEK students as the main attendees of this course. This indicates also how Cognitive Science students are polarized between those quite interested in programming, and those not. Cognitive Science students are comparatively more interested in logic than in computer science, which comes as no surprise. Course PSYK120 is populated only by Cognitive Science students. The group of Cognitive Science students specializing in 'informasjonsvitenskap' performs mostly above average. INF223 is category theory, which is a quite special area even for mathematicians. INF227 is a course in mathematical logic, and underlines how Cognitive Science students indeed prefer logic over programming. It's not an advanced course in logic if given for mathematicians, but even for mathematicians, it is not a basic and easy course. MAT111 is a basic course in mathematics, where Cognitive Science students perform worse than average. Given that only a few Cognitive Science students participated, it is difficult to draw any conclusions. INF102 has MNF130 as recommended prerequisite. MNF130 is a basic course in discrete mathematics, but obviously challenging for Cognitive Science students. Without this recommended prerequisite it is probably not easy to reach grade B in INF102.

Examination results for 2019 mandatory courses can be compared with corresponding examination results for 2018.

| Course | Cognitive Science students | | | ALL students in the course | | |
|------------|----------------------------|-------|------------|----------------------------|-------|------------|
| | Eks. meldt | Best. | Snitt kar. | Eks. meldt | Best. | Snitt kar. |
| <i>h18</i> | | | | | | |
| INFO282 | 28 | 20 | C | 52 | 34 | C |
| INFO283 | 28 | 22 | C | 53 | 37 | C |
| INF100 | 26 | 22 | C | 447 | 366 | C |
| EXFAC00SK | 26 | 23 | C | 264 | 176 | C |
| DASPSTAT | 28 | 26 | B | 31 | 28 | B |
| LING122 | 29 | 25 | B | 63 | 46 | B |
| <i>v18</i> | | | | | | |
| INFO102 | 32 | 30 | B | 134 | 94 | C |
| KOGVIT101 | 33 | 24 | B | 66 | 44 | C |
| LOG110 | 34 | 31 | B | 98 | 69 | C |
| LOG111 | 33 | 30 | C | 42 | 35 | C |
| INF227 | 16 | 10 | C | 25 | 15 | C |
| PSYK120 | 16 | 10 | C | 17 | 11 | C |
| FIL105 | 17 | 15 | B | 42 | 31 | C |

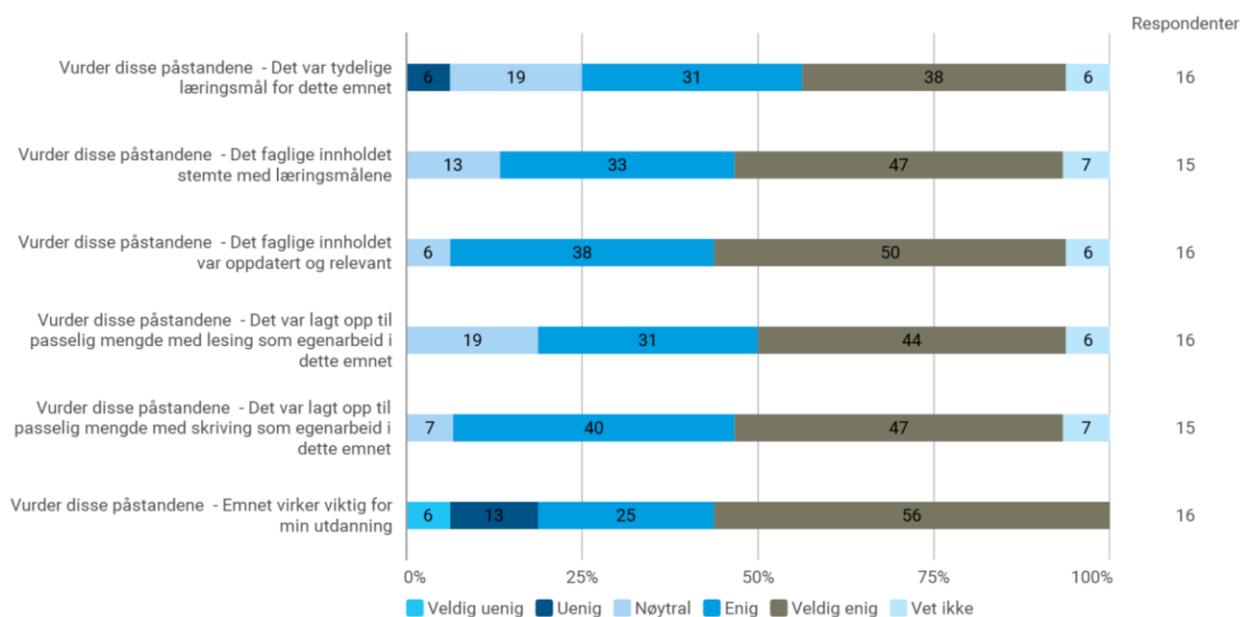
Table 2. Courses, throughput and grades (2018).

3. Quality assurance

‘Emneevaluering’ for INF100/v19 includes teacher’s summary of student self-assessment². INF100/h19 comes without teacher’s summary and evaluation.

Each course and its execution comes with a WHAT, WHY and HOW. WHAT is thought? WHY is it thought? HOW is it thought? WHAT is explained in the course description. WHY is explained mostly as ‘læringsmål’, and it is course specific rather than programme specific. This then means it does not explicitly connect with education objectives on faculty and university level, e.g. as related to strategy plans.

How informative are charts like



summarizing student’s self-assessment? Teacher’s overall conclusion in this case and for similar charts was

Kommentarane frå studentane er gjennomgåande positive. Både undervisninga og oppgåveopplegget blir trekt fram som bra.

What is the range of expected values given these 5-scale questions and charts?

Student self-assessments obviously contain textual parts, but they are presented in the overall course evaluation report. There was e.g. a effective Python discussion, where student’s clearly asks about programming knowledge leading to good practices. Teacher’s summary recognizes these ideas, and the report shows how this particular detail will be reinforced to have effect in the future.

² Student self-evaluation is not mandatory?

2. Enkelte kritiserer at studentane på eksamen ikkje får høve til å kjøra Python-program. Min kommentar:

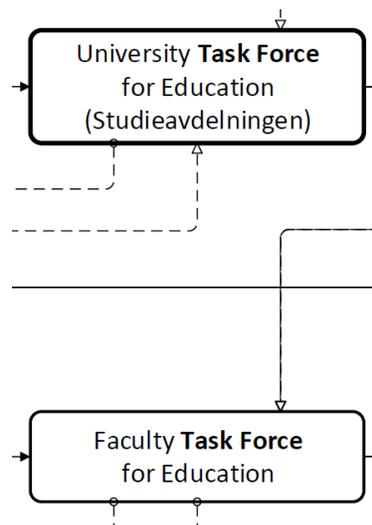
Denne kritikken er det god grunn for. Vi arbeider med å få til ei løysing der studentane på eksamen skal skriva og kjøra program i ein del av oppgåvene. Dette kjem nok ikkje på plass alt i 2019, men vi håper det er klart frå høsten 2020.

In the 2018 report, text from selected course evaluations were presented, many of which seemed to be of similar nature, and in particular as related to WHAT and HOW, even if less as related to WHY. A common flavour in many student comments relate to the conversion of ‘kunnskapar’ to ‘ferdigheter’, and to ‘generell kompetense’.

In ‘studiekvalitetsbasen’ INF100 is in stored under 'Matematisk institutt' at 'matematisk-naturvitenskapelige fakultet', and the latest ‘emneevaluering’ there is ‘Høst 2017 (publisert 04.07.2018)’. Programsensor for KOGVIT 2019 received the ‘Emneevaluering INF100 Vår 2019’ directly from the administration of KOGVIT.

As also stated in report 2018, *course evaluations are important and integral parts of programme execution and further development. Whenever possible, student comments, even unedited, could appear in all evaluations as much as possible. They comments are different in style and attitude, but they all reflect underlying detail and focus for potential improvement, and it is up to the programme task force to utilize them. The programme might even treat them as ‘findings’, some less surprising, some general, some apparently representing a smaller number of students, some immediately suggestive.*

‘Studiekvalitetsbasen’ is indeed not up-to-date, something that

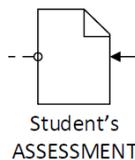


could think about.

In a top-down view, contents of strategies and guidelines are communicated from level to level. The bottom-up reinforcement is less clear.

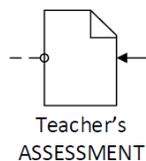
Reinforcement from course evaluation to study programme level, and as related to the quality assurance, is briefly described in this report.

The template for student's self-evaluation



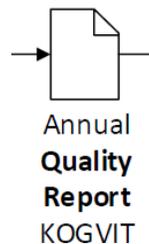
could be discussed. What is to be received from students in order to provide optimal reinforcement, with respect to WHAT, WHY and HOW?

The template for teacher's assessment

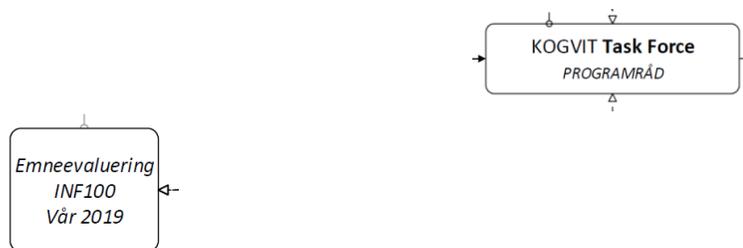


could similarly be discussed on department and faculty level, obviously based on comments from programme level task forces.

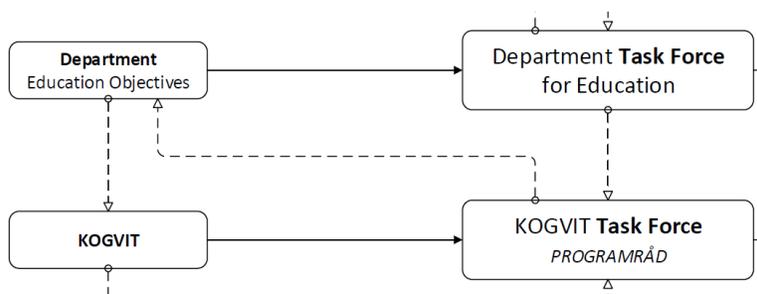
A main challenge is to find optimal ways and tools for providing outcome reporting based on key performance indicators (KPI) in the programme Quality Report.



How are 'emnevaluering' managed by the PROGRAMRÅD, and what are typical actions taken?



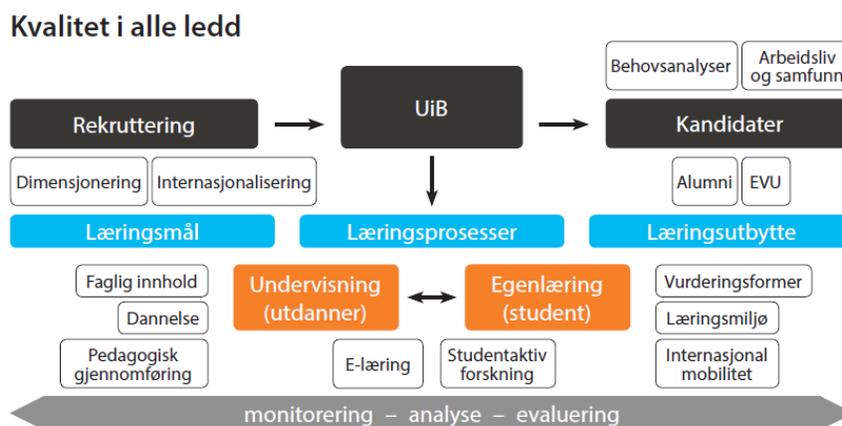
Similarly, but on an upper level, how is quality and outcome, as monitored by the programme task force, reinforced to the Department Task Force for Education?



And so on, reinforcing from department level to faculty level, from faculty to university, and indeed even from university to NOKUT and the Ministry. What are the KPI's used by NOKUT, and how do these KPIs connect with KPIs on university, faculty and department levels? What do the template questionnaires for assessment look like?

UiB's Handbook for Quality Assurance is from 2013, and UiB's system for quality assurance was approved by NOKUT's Quality Assurance Approval Process in 2007.

Quality assurance of education at UiB is detailed at “all levels”:



Quality maintenance and improvement based on feedback from assessment of both learning as well as teaching is less evident. Learning processes and quality assurance processes are not explicitly visualized in detail.

Quality Database (Studiekvalitetsbasen) provide quality reports on the following levels:

- university
- faculty
- department
- programme
- course

On university level, the latest quality report is from May 2013 for Spring 2012³. This report is basically a summary of faculty level quality reports. Feedback on assessment of learning and teaching is not explicit in this report.

On faculty level for 'samfunnsvitenskapelige fakultet', the latest report is from September 2019 for Fall 2018⁴. Its content includes e.g. education as related with UiB's focus areas, and as described in the Action Plan (Handlingsplan) 2017-2022.

On department level for 'Institutt for informasjons- og medievitenskap', the latest report is from September 2019 for Fall 2018. Here we see the feedback loop, in the Table on pp. 1-4. Feedback looping, and reinforcement, is not all that detailed, but it clearly shows a desire to use 'Punkter fra evaluering' for a 'Plan for oppfølging'. A more systematic evaluation expectedly would probably lead to more detailed plans for 'oppfølging'. However, it is unclear what level of detail would be desirable and optimally effective.

On programme level, as for BASV-KOGNI, the latest report is this report.

An improved understanding of overall quality assurance processes, and as involving feedback loops across all levels, could drive quality assurance work in desired directions, defined by the University Risk Force for Education. Relating these university internal processes and its subprocesses also with Government and Ministry level subprocess, even involving subprocesses within NOKUT, might be interesting.

A rather coarse-granular view of an overall process is appended to this report. The process view was designed in Microsoft's Visio, and the underlying process language is OMG's BPMN (Business Process Modeling Language).

³ https://kvalitetsbasen.app.uib.no/rapport.php?rapport_id=4138

⁴ https://kvalitetsbasen.app.uib.no/rapport.php?rapport_id=7529

