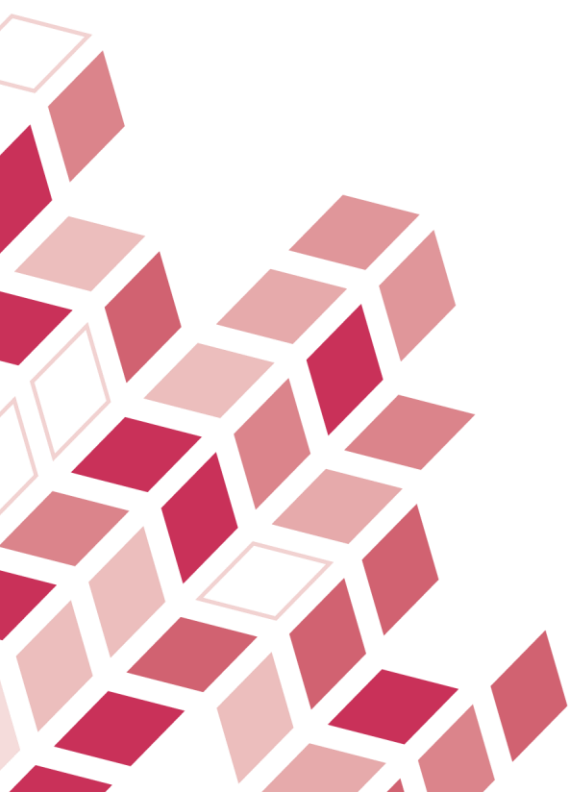


NOKUTS tilsynsrapporter

Sustainable Manufacturing

Master degree study at Gjøvik University College
januar 2012



Institution:	Gjøvik University College (Høgskolen i Gjøvik)
Name of educational provision:	Sustainable Manufacturing
Degree/Studiepoeng (ECTS):	Master degree study, 120 ECTS
Expert Committee:	Professor Torgeir Welo, NTNU Trondheim
	Universitetslektor Göran Gustavsson, Chalmers, Gøteborg
Archive Number:	11/171
Date of decision:	17.01.2012

Introduction

The external quality assurance performed by NOKUT consists of evaluating the institution's quality assurance systems, accreditation of new provisions and revision of accredited provisions. Universities and university colleges have different self-accrediting powers. For an institution without self-accrediting powers to establish a provision in a certain cycle an application must be made to NOKUT.

Hereby NOKUT presents the accreditation report of a master degree study in sustainable manufacturing at Gjøvik University College. The expert evaluation in this report is part of the accreditation process following the application for accreditation of a master degree study in sustainable manufacturing submitted before the application deadline on 15th March 2011. This report clearly indicates the extensive evaluation performed to ensure the educational quality in the planned educational provision.

Master degree study in Sustainable Manufacturing at Gjøvik University College fulfils the conditions for accreditation.

This decision does not have limited validity in time. NOKUT will however make a subsequent supervision of the educational provision within 3 years.

Oslo, 17. January 2012,



Terje Mørland
Director General

All assessments done by NOKUT are public and this and other reports are electronically available on this website: www.nokut.no.

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1 Information regarding the applicant institution

Gjøvik University College is a University College with the right to establish educational provisions at bachelor's level. In addition, the institution has a PhD in Information Security with accreditation from NOKUT. Høgskolen i Gjøvik therefore has the right to establish educational provisions at all levels within the field of Information Security. For all other educational provisions in the second and third cycle, Høgskolen i Gjøvik has to apply to NOKUT for accreditation.

The institution's quality assurance system was evaluated and accepted in 2009. The following educational provisions at the institution have obtained accreditation from NOKUT:

- Gerontologi, master, 120 ECTS, 2010.
- Information Security, PhD, 2008.
- Klinisk sykepleie, master, 120 ECTS, 2007.
- Brukersentrert mediedesign, master, 120 ECTS, 2005.
- Applied computer science (tidligere Medieteknikk), master, 120 ECTS, 2005.
- Teknologi (sivilingeniør) – medieteknikk, master, 2005
- Helsefremmende arbeid og omsorg i lokalsamfunnet, master, 120 ECTS, 2005.
- Informasjonssikkerhet, master, 120 ECTS, 2004.

Gjøvik University College applied for accreditation of a master degree study in Sustainable Manufacturing– 120 ECTS within the application deadline March 15th 2011.

2 Description of procedure

NOKUT makes a preliminary assessment to assure that all basic conditions for accreditation are fulfilled as expressed in the Regulation concerning NOKUT's supervision and control of the quality in Norwegian higher education¹. For applications that have been approved, NOKUT appoints external experts for the evaluation of the application. The external experts have declared that they are not disqualified to perform a professionally independent evaluation.

The expert committee shall come to a clear conclusion, either yes or no, considering whether the quality of the program complies with the requirements in the Regulation based on the committee's assessment. The expert committee is also requested to advice on further developments of the provision's educational qualities even in areas where the quality is satisfactory for accreditation. All criteria must be satisfactorily met before NOKUT makes a decision about accreditation.

If the conclusion reached by the expert committee is negative, the report will be sent to the applicant institution for commentary. The institution is given up to three weeks to comment on the expert committee's evaluation. Thereafter NOKUT makes a decision about whether the comments should be sent to the committee for additional consideration. If such an additional assessment is found necessary,

¹ <http://www.lovdata.no/cgi-wift/ldles?doc=/sf/sf/sf-20110127-0297.html>

the experts are given up to 2 weeks to submit the assessment. The director general then reaches a final decision.

3 Preliminary assessment

Tilsynsforskriften § 4-1 Basic conditions for accreditation

1. Demands expressed in the Universities and Colleges Act concerning the following arrangements will be assessed:
 - a. Internal regulations and governance
 - b. Appeals committee
 - c. Learning Environment Committee
 - d. Educational Plan
 - e. Diplomas and Diploma Supplement
 - f. Quality assurance system

Gjøvik University College has previously obtained accreditation for several master degree studies. Hence, it is presupposed that the demands expressed in the Universities and Colleges Act are fulfilled. Diploma supplement is evaluated as satisfactorily.

NOKUT has considered and found that the form of the application is satisfactory for expert evaluation.

4 Expert assessment

This chapter is the expert committee's evaluation. The term "We" refers to the expert committee as such. The numbering on each heading refer to the corresponding provision in the Regulation concerning NOKUT's supervision and control of the quality of Norwegian higher education

4.1 Basic conditions for accreditation

4.1.1 Demands expressed on the Universities and Colleges Act

These demands have been evaluated by NOKUT in the Preliminary assessment.

4.1.2 Demands expressed in national curriculum frameworks and in relevant Regulations issued by the Ministry of Education and Research must be met.

Assessment

Based on the information reviewed by the committee, the application includes all formal documentation as required by Kunnskapsdepartementet.

Conclusion

Yes, the condition is fulfilled

4.1.3 Estimates of student recruitment, as relevant in relation to the establishing of a satisfactory learning environment and stable provision, must be presented.

Assessment

Recruitment estimate from BSc and industry is 15 FTS on campus and 20 off campus (half time). The committee finds the estimate somewhat optimistic based on the total recruitment base and competition from other internal and external programs. This makes the program sensitive to dropouts. Moreover, how does GUC plan to compensate for the falling expected drop in recruitment from local industry after 3-5 years?

Conclusion

Yes, the institution's presentation is satisfactory

4.1.4 A plan of the students' expected workload must be presented

Assessment

The average work load is 40 weeks and 1600 hours, which meets ECTS. However, the work load is not broken down into lectures, self studies, lab work, etc. All the eight (8) program courses also give 10 credit points each, which has to be justified through the actual contents of each course

Conclusion

Yes, the institution's presentation is satisfactory

4.1.5 When part(s) of the provision is taught outside the degree awarding institution formally agreed documents must be in place to regulate issues of importance for the students.

Assessment

Not applicable (NA) since all formal courses are based at GUC. Routines and requirements for the approval of credits from other universities will however be of help to (internal and external) exchange students

Conclusion

Not applicable

4.1.6 Overall conclusion of § 4-1, 2.-5., Basic conditions for accreditation

The quality complies with the expected level according to the relevant provisions in the Regulation on NOKUT's supervision.

Advice on further developments

- GUC should establish a high quality program that is attractive to students, not only regionally but also nationally and internationally. GUC should also better explain how the program can be kept at predicted size with the expected number of students in a long time perspective (§ 4-1 3).
- GUC should establish a more detailed plan for how the different courses can be broken down into different categories (lectures, lab work, self studies, etc.), see above. A more detailed planning of the course contents is required, highlighting the uniqueness of each course in the total package (§ 4-1 4).

4.2 Study Plan

In this section, the following from the Regulation is referred:

1. The educational provision must have an adequate title
2. The provision must be described with reference to learning outcomes
 - a. Learning outcomes must be expressed in terms of a candidate's intended achievements in knowledge, skills and general competence, as related to the National Qualifications Frameworks.
 - b. The provision's relevance for working life and/or continued studies must be clearly expressed.
 - c. Content and design of the provision must be satisfactorily related to the description of learning outcomes.
 - d. Teaching and student work must be suited for the achievement of intended learning outcomes, as expressed in the plan.
 - e. Exams and other means of evaluation must be suited for the assessment of the students' attainment of intended learning outcomes, as expressed in the plan.
3. The provision must have satisfactory links to research and academic and/or artistic development work, adapted to its level, volume and other characteristics.
4. The provision must be attached to student exchange and internationalisation arrangements adapted to its level, volume and other characteristics.

4.2.1 The educational provision must have an adequate title

Assessment

'Sustainable manufacturing' is an ambitious program title which suggests that sustainability thinking is properly integrated into the curriculum. At a first glance (program name, course titles etc.) this also appears to be the case. However, going a little further into course contents and teaching capabilities/experience, the committee finds it difficult to identify program uniqueness with respect to 'sustainability' and therefore questions whether the name is really justified. Perhaps 'Manufacturing Management' would be a more representative program title? For this MSc to earn its proposed name, however, the course package should demonstrate a clearer, more focused contents towards sustainability, being less 'packed in' within other courses. This could be one or more individual course that include topics like basics/introduction to the field, trends/regulations, technology, economics,

management or/and operations all under the common heading of sustainability; hence, providing more uniqueness in terms of sustainability to the program.

Conclusion

No, the title of the provision is not adequate.

Given the suggested program title, the committee would like to see a clearer sustainability profile in the syllabus and therefore encourages studies of similar programs at other (foreign) universities/colleges. The committee suggests that one or two unique sustainability courses would be required to justify the proposed name. Alternatively, 'management' should be considered as part of the program title, or the courses should focus more on developing sustainability knowledge with a technology profile, at a level that would cover specific regional (and national) needs targeted in the application, such as core products/processes for major companies in the Raufoss industrial park.

4.2.2 The provision must be described with reference to learning outcomes

a. Learning outcomes must be expressed in terms of a candidate's intended achievements in knowledge, skills and general competence, as related to the National Qualifications Frameworks.

Assessment

For each course a description of goal and objectives according to KD regulations is given, although some could preferably have been more detailed and harmonized with others in terms of form. The description (knowledge, competence and skills) for the overall program is however too general, which makes it difficult to see the uniqueness/profile (and intended contribution) of the program.

Conclusion

Yes, learning outcomes are satisfactorily described.

b. The provision's relevance for working life and/or continued studies must be clearly expressed.

Assessment

The connection with the *technology* needs of the regional industry, whatever they are, is not explained very clearly. Sustainability also requires technology improvements in addition to management considerations, and the graduates should have such capabilities and competence. This issue is also linked to the desire to provide a good recruitment to the program, and a demand from the industry for candidates with such competence.

Conclusion

Yes, the provision's relevance for working life and/or continued studies is clearly expressed.

c. Content and design of the provision must be satisfactorily related to the description of learning outcomes.

Assessment

The committee does not see that the syllabus is sufficiently related to the learning outcomes (see p.6). Moreover, the link to the local industry could be more emphasized when it comes to the specific course contents (e.g., could the same program start elsewhere?). A weakness is also the lack of

elective courses and opportunities for the students to specialize, i.e., all of them will take the same courses. There is no variation whatsoever, and it is questionable whether the industry needs 10-15 graduates p.a. with identical competence profiles. The committee sees the necessary corrections as minor, though; the experienced teaching staff would have the capabilities to make adjustments as the program evolves and the needs from different stakeholders become clearer.

Conclusion

Yes, the provision's content and design is satisfactorily related to the description of learning outcomes.

d. Teaching and student work must be suited for the achievement of intended learning outcomes, as expressed in the plan.

Assessment

Different students have different ways to learn, and the program supports different options although it should be possible to take pedagogical advantage of the fact that the expected students come from different environments (industry versus high school). However, focus must be placed on securing that students learn as effectively as possible and that there are means to promote this. Home assessments have to be combined with oral presentations to secure that it is the student who submits the work that has done it. The committee finds the mix between courses, project work (together with industry) and MSc project/thesis as good, and concludes therefore that the minimum requirement is being met.

Conclusion

Yes, the teaching and student work is suited for the achievement of intended learning outcomes as expressed in the plan.

e. Exams and other means of evaluation must be suited for the assessment of the students' attainment of intended learning outcomes, as expressed in the plan.

Assessment

The committee feels that the evaluations and exams described in the application could be changed to more conventional ways of testing learning. It is important to secure the quality and competence level of the graduates especially if a program would happen to have a thin recruitment base. The committee suggests that form of examination can easily be adjusted to include more conventional types of exams, ones that are more suitable to test individual capabilities of students. However, the minimum requirement is met since there is an acceptable proposal for examination in each course (although there is an improvement potential).

Conclusion

Yes, exams and other means of evaluation are suited for the assessment of the students' attainment of intended learning outcomes as expressed in the plan.

4.2.3 The provision must have satisfactory links to research and academic and/or artistic development work, adapted to its level, volume and other characteristics.

Assessment

Although the committee acknowledges the strong formal competence base within the NCE, the professors do not present strong track records within the particular field of sustainability. However, the professors have good track records from academic work and in national and international research projects within related fields, along with a solid industrial network, within related fields. This means that the minimum requirement within this category is met.

Conclusion

Yes, the provision has satisfactory links to research and academic and/or artistic development work, adapted to its level, volume and other characteristics.

4.2.4 The provision must be attached to student exchange and internationalisation arrangements adapted to its level, volume and other characteristics.

Assessment

The committee does not see how the exchange program will function with respect to getting courses from other universities approved; i.e. what are the criteria? The committee acknowledges the agreements signed with different universities but would like to see a more specific implementation plan/procedures for student exchange. However, the committee considers the minimum requirement met since the first priority should be to establish a solid program at GUC.

Conclusion

Yes, the provision has systems for student exchange and internationalisation arrangements adapted to its level, volume and other characteristics.

4.2.5 Overall conclusion for § 4-2, Study plan

The quality of the study plan does not comply with the expected level required in the Regulation on NOKUT's supervision.

- The educational provision does not have an adequate title. Given the suggested program title, the committee would like to see a clearer sustainability profile in the syllabus (§ 4-2 1).

Advice on further developments

- The program should have a stated common vision linked to the program name and the overall knowledge, capability and competence objectives (similar to those defined for each course according to the KD standard), including competence of the candidates (§ 4-2 2 a).
- The institution is advised to evaluate if the program can be more technology oriented in order to be more unique and attractive to the targeted industry. A more general sustainability manufacturing management program could e.g. be established anywhere in Norway, whereas GUC have the qualities to be a unique site for a sustainability manufacturing program with focus on core technologies such as aluminum and composite part production. An explanation of how it is possible to go from the program to PhD studies also outside GUC will further increase its relevance and attractiveness (§4-2 2 b).
- The institution is advised to develop more courses to offer some choices for the students, and develop several tracks. One track could for example focus on the needs of the (local) manufacturing industry. Another track could be more general/theoretical and cater to those who want to continue their studies by pursuing e.g. a PhD at GUC or elsewhere (§4-2 2 c).

- Make sure that learning is tested properly, using individual relevant tests suitable to demonstrate basic competence and competence according to learning goals (3.2.2 d).
- Conventional individual exams (written or oral) should be more frequently used than in the description. It should also be described which 70 % of the courses that need to be passed before entering the M.Sc. thesis (§4-2 2 e).
- Put more focus on research based education in the application and consider a name change of the program (§ 4-2 3).
- Explain procedures for studies abroad – what are the criteria for getting courses from other universities approved etc.? (§ 4-2 4).

4.3 *Discipline community/-ies attached to the provision*

§ 4-3 1 The composition, size and collective competence of the relevant discipline community/-ies must be adapted to the provision as the plan describes it and adequate for the conduct of relevant research and development work.

Assessment

The collective competence is impressive, but the committee is more uncertain about the competence profile of the teaching group, especially within the field of sustainability. However, the teaching group has a long track record and has obviously capabilities to develop a strong competence profile within the field of sustainability. Meanwhile the group should team up with a mentor/expert with strong experience within sustainability.

Conclusion

Yes, the composition, size and collective competence of the discipline community is adapted to the provision as described in the plan, and deemed adequate for the conduct of relevant research and development work.

4.3.2 At least 50 per cent of the academic FTEs allotted to the provision must be members of the institution's own academic staff. Of these, professors (full or associate) must be represented among those who teach the core elements of the provision.

For the different cycles, specific demands apply:

- a. For first cycle provisions at least 20 per cent of the relevant discipline community/-ies must have competence as professors (full or associate).
- b. For second cycle provisions, at least 10 per cent of the relevant discipline community/-ies must be full professors, and an additional 40 per cent associate professors.
- c. For third cycle provisions, PhD or stipend programme for artistic development work, at least 50 per cent of the relevant discipline community/-ies must be full professors, and the rest associate professors.

Assessment

The formal requirements are met

Conclusion

Yes, the requirements are fulfilled.

4.3.3 The discipline community/-ies must be active in research and/or development work.

For the different cycles specific demands apply:

- a. For first cycle provisions, documented results at a level that is satisfactory in relation to the content and level of the provision.
- b. For the second cycle, documented results at a high level of quality.
- c. For the third cycle, documented results at a high international level of quality, with satisfactory disciplinary breadth.

Assessment

The research level is satisfactory, but the research subjects do not appear to fall inside what is usually meant by sustainability. However, the teaching group has strong competence in related fields. Moreover, the application also includes information about upcoming/newly started research projects with a relatively strong focus on sustainability,. Therefore, the committee evaluates the basic requirements as met.

Conclusion

Yes, the conditions are met.

4.3.4 The discipline community/-ies must participate actively in relevant national and international networks and collaborative arrangements/projects**Assessment**

This is a strong point of the application as the contact network (industry, EU and NCE) is impressive, although the contact network does not seem to be in the main focus field of the present program.

Conclusion

The condition is met.

4.3.5 For provision with vocational practice/internship arrangements, the discipline community/-ies and the practice supervisors must have relevant experience from the practice field.**Assessment**

Industry mentors must demonstrate necessary practical experience. However, although the program is directed towards (local) industry, the committee does not see this issue as an essential part since it is not a formal part of the education program. The strong general link to local industry will form a basis for good interaction between GUC and industry.

Conclusion

Yes, the discipline community/-ies and the practice supervisors have relevant experience from the practice field.

4.3.6 Overall conclusion of § 4-3 Discipline community/-ies attached to the provision

The quality complies with the expected level according to the requirements in the Regulation on NOKUT's supervision.

Advice on further developments:

- This issue goes back to the name of the program. Also explain what contribution is expected from guest teachers from the industry, how they can contribute to a rich learning environment. The committee proposes GUC to ask professor em. Sigurd Støren if he could take a mentoring/advisory role in the program build-up phase, particularly to make sure that sustainability issues are addressed properly (§4-3 1).
- GUC could comment on how to free up time for people already involved in BSc education courses (§4-3 2).
- Consider this issue together with the name/actual contents of the program. Also explain how sensitive the program is to possible (key) teacher dropouts, and how such problems can be solved (§ 4-3 3).
- The application should better explain the role of the industry mentor (§ 4-3 5).

4.4 Support functions and infrastructure

4.4.1 The institution must have rooms, library services, administrative and technical services, ICT resources and working conditions for their students that are satisfactory and adapted to the provision as described in the study plan and the number of enrolled students.

Assessment

Passed TOEFL tests do unfortunately not guarantee that international students know English well enough to be able to take part in studies at this level, so GUC should be prepared to offer support in technical English. Learning styles can be very different depending on where students come from and there may be a demand for rooms for religious purposes on the premises etc. How will a students' invention during his/her studies be handled, i.e., who is the owner of the possible commercial value of it, GUC or the student himself/herself? It is recommended that the students have representatives in the council with representatives from the industry that is going to be formed.

Conclusion

The quality complies with the expected level according to the requirements in the Regulation on NOKUT's supervision.

Advice on further developments

Explain more clearly the points above and how to meet different anticipated challenges associated with internationalization.

5 Summary of the Expert committee's evaluation and conclusion

The quality of the educational provision does not comply with all the requirements in the Regulation based on the committee's evaluation:

§4-2 1

The expert committee's demand for correction:

The educational provision does not have an adequate title. Given the suggested program title, the committee would like to see a clearer sustainability profile in the syllabus and therefore encourages studies of similar programs at other (foreign) universities/colleges. The committee suggests that one or two unique sustainability courses would be required to justify the proposed name. Alternatively, 'management' should be considered as part of the program title, or the courses should focus more on developing sustainability knowledge with a technology profile, at a level that would cover specific regional (and national) needs targeted in the application, such as core products/processes for major companies in the Raufoss industrial park.

Following the above, accreditation of the master in sustainable management at Høgskolen i Gjøvik can not be completed.

The expert committee has in some areas found it appropriate to provide advice to the development of the educational provision, provided that the provision later in the further process will be accredited. These suggestions are summarized in the summary of each section, and we recommend that the applicant institution notes these advices.

6 Commentary from the institution

Gjøvik University College (GUC) are happy to read in the expert evaluation that all conditions for accreditation except the title of the master programme (section 4.2.1) is evaluated to be satisfactory acceptable. We will in this answer both give our comment to the title as well as to the other comments and advices given by the Expert Committee *since section 4.2.1 is the only section that was not accepted by the Expert Committee, we will comment on this first and then comment on the advices from the committee to the other sections.*

Comment to the evaluation of section 4.2.1 and bullet point 1 in 4.2.5

GUC wish to keep the title of the master programme as suggested in the application. There are three reasons for this:

1. To offer a master programme who fills the needs in industry following the increasing focus on sustainability
2. To offer a master programme that differentiates from other master programs in Norway (Master in Manufacturing Management does exists at NTNU)
3. To fit with the strategy at GUCs Faculty of Technology, Economy and Management where sustainability is one of the important pillars

GUC agrees, however, with the Expert Committee that the sustainability profile needs to be strengthened and we have already made plans for this. There are plans to change the course “Sustainability in Manufacturing” to a more general basic course in sustainable development, and the manufacturing specific topics are planned to be moved to the in-depth course on sustainable manufacturing in the third semester. GUC have through the EURASIA program established contact with the research group on sustainability at National Technical University of Ukraine : Kiev Polytechnic Institute (NTUU KPI) and have engaged Professor Gennadiy Statyukha, Director of the Central East European Institute for Sustainable Development to be responsible for developing and lecture a course in Sustainable Development as a part of the master programme. Please see appendix #1 for an extended course description. GUC will use SimaPro software for exercises in this course. We believe that this new course, in the addition to the sustainability focus in the other courses as described in the application, will justify the use of “Sustainable Manufacturing” as the title. We wish to emphasize that the master is focused on knowledge needs in manufacturing industry and the main topic is therefore how to achieve a more sustainable manufacturing, and not sustainability in itself.

Moreover, GUC is discussing to develop a course on industrial ecology that will build on the sustainable development course to further strengthening the sustainability profile of the master. This course is still to be developed. GUC have established contact with Professor Emeritus Sigurd Støren at NTNU for a possible mentorship on sustainability, as advised by the committee.

Comments to section 4.1.2: advice in bullet point nr 1 in 4.1.5, and bullet points

GUC are planning actions to broaden the recruitment base both from its own bachelor students and regionally, nationally and internationally.

GUC are planning to extend the master into three tracks in the third and forth semester. The new tracks will contain courses suited for bachelor students within Sustainable Building Production and Industrial Economics. This will broaden the recruitment basis from GUCs own bachelor programs as well as give the master students a wider selection of courses to choose from. The extension of the master will also broaden the recruitment potential from industry since a larger part of the regional industry will be covered.

For the recruitment on a national level, GUC believe the possibility for off-campus net-based studies and blended learning is a key factor. This is already described in the current application, see a more extended description in appendix #2. GUC focuses on strengthening the international profile of the master study. GUC have made a project proposal for the EURASIA programme to fund a co-operation with the pervious mentioned NTUU KPI with exchange of 10 master students annually. GUC will utilize its international network to strengthen the international profile of the master programme in order to expect an increasing recruitment of international students.

Comment to section 4.1.3, 4.2.2 and bullet point 2 in 4.1.5

GUC are working on a detailed plan for the master programme where the work load will be broken down, and learning outcomes and syllabus will be more thoroughly described. This plan is yet to be completed. Regarding regional manufacturing industry technology needs; the master is not intended to cover manufacturing technology in details, except for sustainability related issues regarding technology. GUC believes other master programs, particularly at NTNU where manufacturing technology are the major topic, will cover the need for technology focused master studies, and that the

GUC master programme is a supplement to this. Moreover GUC wish the master to be a high quality programme attractive to students locally as well as outside the region, both nationally and internationally.

Assessment methods are planned to be a mix of home assessments, individual project works, paper writing as well as traditional written exams. GUC believe these are state-of-the art assessment methods well suited for blended learning with a mix of on- and off-campus students.

Comment to section 4.2.3, 4.3.1 and 4.3.3

Trough the engagement of Professor Gennadiy Statyukha, Director of the Central East European Institute for Sustainable Development at NTUU KPI and possibly Professor Emeritus Sigurd Støren at NTNU, GUC will strengthen the Sustainability competence and the connection to state-of-the-art research on sustainability.

Comment to section 4.2.4:

GUC have in its Quality Assurance System tools for approving courses form other universities. (This was not described in the application)

A specific plan for exchange of students is established in the co-operation with KPI. Similar bi-lateral agreements and specific plans for students exchange will be made with other universities.

Comment to section 4.4.1:

GUC already have international profiles on other Master and PhD programs, are used to international students and have special programs for integration and adaptation to different learning styles. Moreover, GUC has teaching capacity on technical English.

7 Expert committee's additional evaluation

Before further comments are given below, the committee would like to point out that the (only) major issue in the above mentioned evaluation was a lack of transparency between the actual overall program contents and its name/title. In addition, some minor observations were made and commented.

The last commentary document from GUC lists a number of corrective actions based on the committee's first evaluation of the application for accreditation. The most important proposed change is strengthening the sustainability profile of the program by establishing a new course 'Sustainable Development', and moving the course 'Sustainable Development' (with the more manufacturing specific issues) into the third semester. GUC is further searching an active cooperation with NTUU KPI (in Kiev, Ukraine), and is planning to engage Professor Gennadiy Statyukha for developing and teaching the course 'Sustainable Development'. A tentative course description is included in the commentary document. In addition, GUC evaluates engaging Prof. Em. Sigurd Støren for a mentorship in sustainability, along with an additional course, 'Industrial Ecology'.

With one or two new courses the commentary does not explicitly state if the proposed change gives more elective courses in the second year or, alternatively, if any of the original courses are withdrawn.

The committee acknowledges that the proposed change will strengthen the sustainability profile, hence providing a differentiated program that fills industrial (sustainability) needs within the strategy of GUC. It is, however, essential that GUC's more long-term strategy, say in a 3-year perspective, includes establishing its own in-house teaching and research capabilities within the field on a more permanent basis. To enforce the programs uniqueness, the ambition level should be integrating sustainability and manufacturing into a high-quality master program.

GUC is further planning actions to increase the recruitment base, and to offer more elective courses. More specifically, the third and fourth semesters will be extended into three parallel elective tracks. The suggested extension is in line with the recommendations given in the previous evaluation by the committee. However, this would require additional resources and courses, and may enter into a 3-year strategy once the base program is up and running. The committee acknowledges the ambitions to offer off-campus net-based studies, although it is important to use the available resources to develop the base program locally in a start-up phase.

The committee recommends that GUC develops a strategy for implementation of the proposed changes - including resources, syllabus (updated), learning goals, etc. - in the perspective of *program execution*. Based on the last commentary document received and the evaluation above, the committee in conclusion also recommends that GUC receives its accreditation of Master in sustainable manufacturing.

8 Decision ²

Høgskolen i Gjøvik søkte til søknadsfristen 15.mars 2011 om akkreditering av mastergradsstudium i Sustainable Manufacturing (120 studiepoeng). De sakkyndige avga sin vurdering 8.7.2011, og tilleggsvurdering 30.8.2011.

NOKUT vurderer at vilkårene i NOKUTs forskrift om tilsyn med utdanningskvaliteten i høyere utdanning av 27.1.2011 er oppfylt, og vedtar at mastergradsstudium i Sustainable Manufacturing (120 studiepoeng) ved Høgskolen i Gjøvik akkrediteres.

Akkrediteringen er gyldig fra vedtaksdato.

NOKUT forutsetter at Høgskolen i Gjøvik fyller de til enhver tid gjeldende krav for akkreditering. I tillegg forventes at høgskolen vurderer de sakkyndiges merknader og anbefalinger i det videre arbeidet med utvikling av studiet.

For mastergradsstudier som NOKUT akkrediterer, må institusjonen selv søke Kunnskapsdepartementet om rett til å etablere studiet.

² The decision is written in Norwegian, as all correspondence in this case has been in Norwegian. The decision of accreditation in this case is positive.

9 Documentation

Application for accreditation: Høgskolen i Gjøvik- søknad om akkreditering av masterstudium – Master in Sustainable Manufacturing, arkivsak 11/171, journalnummer: 11/939.

Comment from institution: Tilsvar til sakkyndig vurdering- Høgskolen i Gjøvik- søknad om akkreditering av masterstudium- master in Sustainable Manufacturing. Arkivsak 11/171, journalnummer 11/2291.