



Programrapport

Programmets namn: Resource Recovery- Biotechnology and Bioeconomy Resource Recovery- Sustainable Energy Processes Resource Recovery- Polymer Materials for a Circular Economy	Ladokkod: TAREB 1246A TAREE 1247A TAREP 12048
Antal högskolepoäng: 120	Årskull 2021
Programansvarig: Anita Pettersson and Akram Zamani	

Enligt Riktlinjer för löpande utvärdering av kurser och utbildningsprogram vid Högskolan i Borås (Dnr 589-17) ska programrapporten utgå ifrån följande aspekter:

- 1) Studenternas möjlighet till ansvar och delaktighet
- 2) Sambanden mellan programmets kurser samt mellan examensmål, lärandemål undervisningsformer och examinationer
- 3) Forskningsanknytning i programmet
- 4) Programmets resurser och hur dessa har använts
- 5) Programmets användbarhet och förberedelse för ett föränderligt arbetsliv

This is the first program evaluation for our three new MSc programs:

Resource Recovery- Biotechnology and Bioeconomy

Resource Recovery- Sustainable Energy Processes

Resource Recovery- Polymer Materials for a Circular Economy

Of the students who were admitted in 2021 to the programs, **15 students** successfully presented their thesis work. From that group of students, **9 students** already graduated from the program at the end of August 2023. Regularly, there are several groups of exchange students from different universities who join the program to study different course packets in our programs. Often those exchange students integrate to the class very well and there are a lot of good interactions between them and program students, which results in improvement of their learning. This time we had **6 exchange students**, from France, Turkey and Germany who joined the program in spring semester 2022 and studied some courses together with the program students.

Analysis of

1) Studenternas möjlighet till ansvar och delaktighet

The program provides students with the opportunity to influence the program through close contact with the program coordinator and the teachers. In connection with course evaluation for all our courses, students have the opportunity to give feedback and suggestions for improvement of the courses. This happens both during the courses and at the end of each course.

The final program evaluation was performed in connection with the master thesis presentation, on June 1st, 2023. 12 students participated to the program evaluation and wrote answers to 8 different questions.

- ✓ 67% of students think the program has met their expectations. 33.3% think the program has to some extent met their expectation. One of the student suggestions was involving peer review in the examination forms in the program. This has already been started in some courses (for example Resource Recovery and Bioprocess Design), we will discuss the possibility for having peer review in other courses and the master thesis project.
- ✓ 83.3% of students were generally happy with the organization of whole program. And 91.2% were happy with the courses they had in the first year of program. Students had some suggestions for potential improvements in the courses which will be discussed with the corresponding teachers.
- ✓ Most of the students, more than 83%, were very happy with the thesis work in year 2. One student proposed midway seminar for the thesis work, this will be discussed with the course coordinator for the master thesis and other colleagues to evaluate the possibilities.
- ✓ Having more study visits was requested by some students, and we will investigate possibilities for that.
- ✓ 11 out of 12, students will recommend the program to a friend, which is very gratifying.

2) Sambanden mellan programmets kurser samt mellan examensmål, lärandemål undervisningsformer och examinationer

The courses in the program are varied in structure with different teaching and examination methods. The teaching is done with traditional lectures, online lectures, recorded lectures, laboratory work in the lab or with simulation programs, seminars, group discussions, study visits, project work with report writing and oral presentation, and practical research.

In the new MSc programs starting autumn 2021 more of the parts seminars, discussions and case studies are involved compared to the previous version of the program. In the first semester, courses aim at acquiring a broad comprehension of the present and future aspects of the resource recovery. This entails the ability to understand business insights and methodological knowledge,

including life cycle analysis. During the second year, the program offers the courses related to the specific orientation that the students have selected (Biotechnology, energy, or polymer).

3) Forskningsanknytning i programmet

The program is research-oriented with teachers who actively contribute to research in Resource Recovery. Most courses are directly linked to research ongoing in Resource Recovery and the teachers are both teachers and researchers in various areas such as thermal processes, polymeric materials, biotechnology, and resource management. The courses highlight cutting-edge research and highlight the niches and possibilities for development in resource recovery.

Several courses contain examination moments which is research oriented, this includes finding information from the literature, analysis of the information and making selections between the possible alternatives and writing reports and scientific texts.

Students do their degree projects which often are experimental or can be simulation with related software. During the thesis project, students get opportunity to conduct research in a research-oriented environment in our laboratories or in collaborations with companies and other researchers.

4) Programmets resurser och hur dessa har använts

The program gets benefit of the teachers' teams and laboratory resources. Almost all the teachers, seniors, and juniors, are actively contributing to both education and research, and this makes a unique environment where our students get familiar with both basic concepts and also state of the art regarding resource recovery.

Students are also often invited to research seminars. During the projects and case studies, students have opportunities to discuss research questions with our doctoral students and researchers who are working with a relevant subject.

We have well equipped laboratories in the department of resource recovery and all equipment is available for our courses and student projects. Availability of our teachers and lab resources outside the booked hours is very good, which is often appreciated by the students.

5) Programmets användbarhet och förberedelse för ett föränderligt arbetsliv

We, as teachers, are happy to see that our students are wanted at the market and that industry values their knowledge. So far, **3/9** graduated students have already got **job** in Swedish industries and research institutes.

We are also happy to have these students with these skills as potential PhD-students (approximately 50% of our current PhD student, have studied our master program) and we also know that they have got opportunities for PhD studies at other Swedish universities such as

Chalmers, UMU, LTU, University of Linnaeus University and other countries. So far **2/9** graduated students of this year, have got **PhD positions**.