

## **Accreditation Report**

Accreditation of

**German University of Technology in Oman**

**“Mechanical Engineering” (B.Eng.), “Environmental Engineering” (B.Eng.),  
“Process Engineering” (B.Eng.)**

### **I Procedure**

**Date of Contract:** August 13<sup>th</sup>, 2014

**Receipt of self-evaluation report:** January 20<sup>th</sup>, 2015

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**Standing Expert Committee:** Engineering

**Attendance by the ACQUIN Office:** Clemens Bockmann

**Accreditation scheduled:** September 28<sup>th</sup>, 2015

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The **evaluation report** of the peer group is based on the self-evaluation report of the GUC and extensive discussions with the President, the head of the study programme, staff representatives (lectures), and students.

**Evaluation criteria** have been the “Kriterien des Akkreditierungsrates für die Akkreditierung von Studiengängen” in the actual official version.

**Content**

<b>I</b>	<b>Procedure .....</b>	<b>1</b>
<b>II</b>	<b>Introduction .....</b>	<b>3</b>
	1 Short Profile of the Higher Education Institution (HEI) .....	3
	2 The programmes in their faculty framework .....	4
<b>III</b>	<b>Evaluation .....</b>	<b>5</b>
	1 Objectives of GUtech and its Faculties .....	5
	1.1 Objectives of GUtech .....	5
	1.2 Objectives of the Department of Engineering .....	6
	2 Objectives of the Study Programmes .....	6
	2.1 Short summary of the Study Programmes .....	6
	2.2 Competencies to be achieved .....	7
	2.3 Involvement into Society and Personality Development .....	9
	2.4 Employability .....	10
	3 Concept of the Study Programme .....	11
	3.1 Admission Criteria .....	11
	3.2 Concept .....	12
	3.3 ECTS & modularization .....	15
	3.4 Teaching Methods .....	16
	3.5 Developments since introduction .....	18
	4 Implementation .....	18
	4.1 Resources .....	18
	4.2 Organisation & Cooperation .....	21
	4.3 Examination System .....	22
	4.4 Documentation and Transparency .....	24
	4.5 Gender Justice and Equal Opportunities .....	25
	5 Quality Management .....	26
	5.1 Organisational Framework .....	26
	5.2 Evaluation procedures and data analysis .....	27
	5.3 Mechanism for enhancing the study programme .....	28
	6 Summary .....	30
<b>IV</b>	<b>Recommendation to the accreditation commission of ACQUIN .....</b>	<b>31</b>
	1 Evaluation according to the „Kriterien des Akkreditierungsrates für die Akkreditierung von Studiengängen“ (08.12.2009, official version) .....	30
	2 Accreditation .....	<b>Fehler! Textmarke nicht definiert.</b>
	2.1 Conditions .....	31
	2.2 Recommendations .....	31

## **II Introduction**

### **1 Short Profile of the Higher Education Institution (HEI)**

The German University of Technology in Oman (GUtech) is one of seven private universities in Oman. It is associated with RWTH Aachen and was established in the Sultanate of Oman in 2007 to provide programmes of study and research. According to Omani legislation all private higher education institutions in Oman must be affiliated to an internationally renowned university to ensure the international benchmarking of the offered programmes. The GUtech was established with the support of H.E. Abdullah bin Mohammed Al Salmi, the Omani Minister of Endowments and Religious Affairs and the German Academic Exchange Service. A collaborative agreement between the Oman Educational Service LLL (OES) – the owner of the university – and RWTH Aachen defines the condition and tasks of both parties. OES is registered at the Ministry of Commerce and Industry in Oman with the purpose of running the university.

Within the Omani system of higher education GUtech competes with Oman's largest public university the Sultan Qaboos University with 19.000 students, and six private universities as well as twenty private colleges.

In September 2012, GUtech moved to its custom built campus located in Halban at the western outskirts of Muscat. The facilities built in Phase I., i.e. the main academic building and three student/staff dormitories can house 2,000 students. The new campus is not completed yet – new buildings were under construction at the time of the on-site-visit. GUtech wants to reach this number of 2,000 students – including participants of the "Foundation Year" – within the next years. With a total area of 500,000 m<sup>2</sup>, the campus is designed to accommodate GUtech's growth strategy over the next decades for up to 20,000 students. In 2016 GUtech will have its first institutional accreditation by the Oman Academic Accreditation Authority.

The university consists of four faculties: the Faculty of Business and Economics, the Faculty of Engineering and Computer Science, the Faculty of Mathematics and Sciences and the Faculty of Urban Planning and Architectural Design. As subdivision there are six departments: Applied Geosciences, Computer Science, Engineering, Mathematics and Sciences, Sustainable Tourism and Development and Urban Planning and Design.

The number of employees was 173 in total (75 academic and 95 administrative) in 2014/15 with 1,134 students enrolled in one of the following programmes:

- Foundation Programme – Core Foundation
- Foundation Programme – Academic Foundation
- Applied Geosciences (AGEO)
- Computer Science (CS)

- Logistics (LOG)
- Mechanical Engineering (ME)
- Process Engineering (PE)
- Environmental Engineering (EE)
- Sustainable Tourism and Regional Development (STRD)
- Urban Planning and Architecture (UPAD)
- Petroleum Geoscience (PGEO)

All degree programmes at GUtech are taught in English, including written and oral tests, seminar papers, and the Bachelors' and Masters' thesis. GUtech is the only private HEI in Oman asking for an IELTS score of at least 6.0 to enter a bachelor programme. Due to the quality of the local high school education system, most students cannot immediately enter the Bachelor programmes but first complete at least one foundation year at GUtech. Students with low proficiency in English may even need a second foundation year. Students are also expected to develop communication skills in German as a preparation for courses abroad.

In order to establish international compatibility and to allow academic recognition according to European standards, the European Credit Transfer System (ECTS) is used at GUtech.

For the programmes "Mechanical Engineering" (B.Eng.), "Process Engineering" (B.Eng.) and "Environmental Engineering" (B.Eng.) a tuition fee of about 2940 Omani Rial (OMR) for Omanis and 3900 OMR for non-Omanis is required.

## **2 The programmes in their faculty framework**

The Department of Engineering currently offers the three Bachelor programmes ME, PE, and EE, which are subject of this procedure of accreditation. The first two programmes were introduced in 2011, the latter in 2013. The study programmes' duration is 8 semesters (240 ECTS-points). Every winter semester up to 120 applicants can enrol in the three programmes.

### III Evaluation

#### 1 Objectives of GUtech and its Faculties

##### 1.1 Objectives of GUtech

GUtech's superior objective is to become leading technical university in Oman and the Arab states. The university strives for a leading role in the three pillars education, research and innovation and to serve the society as a whole through promotion of research and development. Study programmes should follow the Humboldt model, so teaching and learning should be based in research and practical experience. GUtech points out as its mission to provide students with the education required to become highly qualified and socially responsible graduates, guided by German excellence in science and technology and with a firm grounding in Oman's culture and heritage. The university aims to provide a high quality scientific and technologic state-of-the-art education which meets the needs of the students, the need of the Sultanate of Oman and the wider region. Graduates of GUtech should be prepared for the rapidly changing and culturally-diverse working life. So they should have not only detailed knowledge in their chosen subject, scientific-theoretical and analytical skills and good methodological competencies, but should also have the ability of critical and creative thinking to find new and innovative solutions for complex problems, to cope with new challenges and to work in an interdisciplinary environment. GUtech values in particular to welcome students and employees from both genders, all ethnical, geographical, cultural and religious backgrounds. The University encourages association in peace and with tolerance, and welcomes further intercultural exchange between Oman and Germany.

The university is currently in a transition phase from its initial to a consolidation status. It has to cope with the growth of the university, governmental changes in scholarship regulations and simultaneously maintaining the quality of its study programmes. Since the last accreditation GUtech has put a lot of effort in the revision of its study courses and in designing new programmes. Additionally, the move to the new campus required a big effort. The new campus is not completed, as new buildings still have to be built. Therefore, it is comprehensible that research activities at GUtech were not given highest priority. In order to fulfil its strategic objective of becoming a centre of excellence, GUtech should strengthen its research in the future. To do so the peers recommend to promote research activities and to develop a research strategy.

The peer group considers the overall objectives of GUtech positive. The objectives are in accordance with the relevant Omani and German regulations and qualification frameworks. Concerning the latter the study programmes complies with the requirements of the Framework of Qualification for German Degrees, the requirements of the "Common Structural Guidelines of the Länder for the Accreditation for Bachelor's and Master's Courses", and the binding interpretation and summary of these requirements by the German Accreditation Council. The aims and intended

learning outcomes of the programmes are consistent with the type and level of studies and the offered qualification level.

## **1.2 Objectives of the Department of Engineering**

A third of the students shall enlist in the Department of Engineering. The study programmes offered by GUTech's Department of Engineering are based on the expertise of RWTH Aachen's Faculty of Mechanical Engineering, which is also home to the field of process engineering. The first part of these programmes aims at teaching fundamental tools and general skills of engineering. The programmes hence share a common fundamental structure. Dedicated courses in the advanced semesters account for individual training and ensure that the individual qualification aims are met.

Both the Department of Engineering and GUTech have plans for extending the range of programmes and degrees offered, especially regarding Master programmes, once the current programmes have been thoroughly established. There are plans for two engineering masters – "Mechanical Engineering" (M.Eng.) and "Process & Environmental Engineering" (M.Eng.) – open for 15-20% of the Bachelor programmes' graduates.

## **2 Objectives of the Study Programmes**

### **2.1 Short summary of the Study Programmes**

The study programmes are conceptualized according to the qualification objectives. The aim of the "Mechanical Engineering" (B.Eng.) (ME) and "Process Engineering" (B.Eng.) (PE) programmes is to develop the knowledge and competencies required to meet the demands of the profession of Engineering in the Sultanate of Oman and the region. The programmes should:

- Be appealing for high-school graduates interested in starting a course of study (applicant level)
- Supporting the personal development of students and an allow for an engaging curriculum (student level)
- Fulfilling the demands of the local and international industry regarding the qualification and knowledge of graduates and meeting the expectations of both the German and Omani scientific community (employee level)
- Integrate the requirements and current challenges stated by the society and environments, both locally and internationally, by educating responsible graduates (citizen level)

The aim of the "Environmental Engineering" (B.Eng.) (EE) programme differs slightly from the other two other programmes. It aims to develop the knowledge and competencies required to

meet the demands of the profession of environmental engineering, in the Sultanate of Oman and the region. The programme aims at creating a new generation of engineers with skills allowing them to ensure the realisation of the concept of “Sustainable Development” and address society's environmental and natural resource challenges. The programme will provide students with a sound theoretical and practical understanding of environmental issues in all three sectors – private, governmental, and non-profit – in preparation for careers as environmental engineers in a range of organisations. With this programme students will learn how to identify, assess and shape environmental ideas into real business opportunities and how to support such ventures through entrepreneurial private, government and civil society initiatives. Adopting an interdisciplinary approach, the coursework combines a conceptual review of the relationships among business, industry, environment, and society, with a much more applied examination of the wide range of initiatives that relate to environmental management and sustainable development.

All three programmes under review aim at high-school graduates who want to start an engineering profession. Whilst this applies for most of the enrolled students, some have already worked (or are still working) in this professional field and use the programme to enhance their knowledge and competencies and have them proven by an academic degree. Currently in each programme the following numbers of students are enlisted:

- Mechanical Engineering (B.Eng.): 73 students;
- Process Engineering (B.Eng.): 122 students
- Environmental Engineering (B.Eng.): 52 students

The department has planned 100 intakes in all three programmes together for the immediate future.

The programmes were developed under the guidance of a curriculum committee led by experts from RWTH Aachen to ensure the quality. In addition, the Professor for International Education and former Deputy Rector for Academic Affairs at GUTech, provided input with respect to the student profile in the Sultanate of Oman as well as ministerial requirements.

## **2.2 Competencies to be achieved**

According to the self-evaluation report competencies to be achieved in both ME and PE are the same with a difference only in the field of expertise. While ME focusses on competencies required for manufacturing, machine construction and development, and business management, PE aims at competencies required for the design of mechanical, chemical and thermal processes.

The competencies in detail are:

- Knowledge and understanding of engineering: Graduates have gained a broad and sound knowledge in mathematics, science and engineering, enabling them to understand the phenomena characteristic to mechanical engineering and process engineering respectively. The graduates have also gained an understanding for the broader multi-disciplinary context of engineering sciences.
- Engineering analysis: Graduates are able to identify, formulate and solve problems particular to mechanical engineering and process engineering respectively based on the application of established scientific methods; Graduates are also able to analyse products, processes and methods used in their discipline based on scientific facts; They know how to select suitable methods of analysing, modelling, simulating and optimising and apply them with a high degree of competence.
- Engineering design: Graduates have developed the ability to design machinery, devices, programmes or processes according to specified requirements; They have developed a practically oriented understanding of design methods and the ability to apply them in a competent manner.
- Engineering practice: Graduates have developed the competencies to transfer new findings in engineering and natural sciences to industrial and commercial production under consideration of economic, ecologic and safety requirements; Graduates are able to plan, control and monitor processes and to develop and operate systems and equipment; They are also able to independently consolidate the knowledge gained and are aware of the non-technical effects of engineering activities.
- Investigations and assessment: Graduates are able to carry out literature research and know how to use data bases and other sources of information for their work; they have developed the skills to plan and carry out suitable experiments, interpret the data and draw suitable conclusions.

Different to the study programmes mentioned above, the EE programme provides competencies required for sustainable development. This includes an overview of the global and local challenges, renewable energy systems and energy efficiency, methods for controlling air pollution, types and rating systems of green buildings, procedures of environmental impact assessments, technologies of waste water treatment and desalination, and methods for solid waste management.

While the professional competencies provided in the study programme EE are virtually the same as in the case of ME or PE, the methodical competencies differ due to the interdisciplinary aspects of the area of application:

- Environmental Impacts and Mitigation: Graduates are able to identify, formulate and solve problems particular to surrounding environment based on the application of established scientific methods; graduates are also able to analyse environmental impacts of products, processes and methods based on scientific facts; they know how to select suitable methods of analysing, modelling, simulating and optimising and apply them with a high degree of competency to mitigate negative impacts.
- Green Innovation and Entrepreneurship: Graduates have developed the ability to develop innovative ideas and transfer them to green business based on scientific facts; they have developed a practically oriented understanding of green businesses and the ability to apply them in a competent manner.
- Engineering practice: Graduates have developed the competencies to transfer new findings in engineering and natural sciences to sustainable development actions for Oman and the whole region, including sustainable water management, green buildings, renewable energy, waste management, and controlling air pollution; They are also able to independently consolidate the knowledge gained and are aware of the environmental related impacts of engineering activities and mitigation measures.
- Investigations and assessment: Graduates are able to carry out literature research and know how to use Geographic Information System (GIS) and other sources of information for their work; they have developed the skills to plan and carry out suitable experiments, interpret the data and draw suitable conclusions.

The competencies aspired by the study programmes cover scientific and technical aspects. According to the opinion of the peer group they fit for the objectives of the study programmes and are adequate for a Bachelor degree. They provide the graduates with the essential knowledge and abilities of an engineer.

### **2.3 Involvement into Society and Personality Development**

GUtech is strongly committed to ethical principles. Besides knowledge and competencies linked to the specific subject, students should also acquire competencies which are summarised as soft-skills and personal competencies. Self-management and team work are further skills students should acquire. Also students should be able to develop own ideas and ethical and social responsibility and to work in an intercultural work environment. The students conduct several projects during their study period that are related with society's benefit e.g. to ecological improvement of conditions of Oman (Desalination-projects, ECO-Initiative).

Students should have a good knowledge in Oman's culture and heritage so that they can contribute to the further development of Oman and its society. Therefore, the students are obliged to take "Language and Cultural Skill"-classes during the first five semesters. Even though this is not

fully agreed among the professors and lecturers, it is necessary to develop essential intercultural awareness for the international employability.

Language skills are another issue of personal development. Professional English language skills are absolutely essential, however it should be discussed whether German courses could be offered on a more voluntary basis. German courses were justified by GUTech staff in the way that proficiency in German is essential for an exchange semester at RWTH Aachen and for joining its laboratory courses. Since this exchange semester and the laboratory courses in Aachen are not mandatory, it is equally fair to offer German courses on faculty level. Besides, the number of courses can merely be an introduction in German language skills, but it does not nurture them to such a level which is necessary to communicate in German adequately.

Setting this point aside, the peer group recognises the good performance of GUTech to transmit competencies for involvement in society and to foster personality development.

## **2.4 Employability**

There have been no graduates from GUTech, so that there are no statistical data available for the time being. The study programmes consist of the general areas for engineering quite aligned to the RWTH Aachen concept. Taking into consideration the fact that a latent demand for engineers is observed by GUTech, the employability can be estimated as high. The concept of GUTech to hold all courses and theses' in English language, the enrolment of students from other regions – although, currently, only expatriates, i.e. children of families that stay temporarily in Oman – as well as the involvement of fly-in professors from abroad helps to raise the intercultural awareness of the graduates. The promising combination of broad engineering knowledge in combination with intercultural skills and good English language proficiency shows a profound basis for careers both in Oman as well as abroad.

The education provided by the ME and PE programme will allow graduates to work as mechanical engineers and process engineers respectively in a multitude of areas within industry or government, in field such as research and development, design, production planning, sales and distribution, plant design and engineering, management and organisation. The main industry area with essential vacancies and demands for engineers is the oil and gas industry. The discussion with the students showed that this industry is quite popular, from the viewpoint of career opportunities, social benefits and salary conditions. Another field is the mining industry focused on mineral resources such as copper and chromium.

According to GUTech's self-evaluation report the graduates of the EE-programme should have the necessary knowledge and capabilities to start-up their own green business or to contribute to green innovation in business and government settings. Graduates may follow a broad range of careers, e.g. in manufacturing, food industry, energy, water, construction and technology sectors,

in local or regional businesses. Job opportunities include also positions in governments, think tanks and consulting firms, and NGOs, such as: policy makers and regulators in government, planner in the private sector, environmental consultants, and sustainability coordinators for businesses. There are in fact environmental industries, e.g. sea water desalination and water treatment.

Representatives from the local industry reported that they are mostly quite happy with the graduates from GUtech, especially regarding technical background and their good working attitude, which is nurtured by the demanding study conditions. The demand of labour forces in the industrial sector aimed at with the study programmes ME, PE, and EE is approximately 40.000 while currently only 8.000 employees are available. Therefore the chance of an adequate employment is very high. However, this only reflects the situation of graduates with Oman nationality. Due to the "Omanisation" rules which restrict the employability of non-Omanis in the Oman economy it is quite difficult for expats to find a job in Oman equivalent to their degree.

Overall, the peer group comes to the conclusion that the students acquire ideal competencies to take up a qualified employment. Potential obstacles against an employment result from external factors and are not inherent in the study programmes.

### **3 Concept of the Study Programme**

#### **3.1 Admission Criteria**

Admission to GUtech's engineering bachelor programmes requires at least a pass in the relevant stream of the university's "Foundation Programme". Additional requirements such as a pre-study internship, entrance examinations and/or interviews may be imposed. No more than a three-month internship or industrial placement may be required for admission to a programme of study (cf. Academic Regulations, point 3.2.2). The minimum language requirement for admission to one of GUtech's undergraduate programmes is IELTS 6.0 with no band below 5.0 or equivalent. Students must submit language certificates such as TOEFL or IELTS as proof of their English language proficiency (cf. Academic Regulations, point 3.3.4). Students who do not have the required English proficiency or sufficient pre-university competencies in engineering might have to enlist in the "Foundation Programme" (FP).

The FP is committed to improving students' English language proficiency and, depending on their degree path in the second year of the FP, developing their ability in other core subjects: mathematics, information technology, physics, chemistry, creative design, and economics. Students are expected to achieve a level of proficiency that will allow them to gain entry to and succeed in the academic (i.e., bachelor) degree programmes offered by GUtech. The FP comprises four semesters over two academic years for students of the engineering study programmes. The first year is the

Core Study Skills Programme (CSP), and the second year is the Academic Study Skills Programme (ASP). Depending on their English skills, students may attend only the second year of the FP, which is the case for the majority of students.

While the FP provides content-specific teaching and learning opportunities, the department also prepares students in active study skills required for effective critical thinking and independent learning to meet the challenges of an academic environment. Depending on their choice of degree programme in the ASP (Computer Science, Engineering, Geoscience, Logistics, Sustainable Tourism and Regional Development, or Urban Planning and Architectural Design), students also receive tuition in the relevant natural sciences, creative design, economics and IT to equip them with content-specific knowledge and skills. The intent and curriculum of the FP is very suitable for the later students and got the full acclaim of the peer group. However, professional English (technical terms) should be included in the English language courses to facilitate the students' learning capacities at the beginning of the study programmes.

The recognition of credits or (entrance) qualifications of other higher education institutes or of prior experience (advanced standing) is regulated in the "Academic Regulations". Theoretically, students coming from other schools and other programmes can have relevant credits transferred, if they come from an accredited institution; otherwise, students may be given a chance to prove their transferrable knowledge in an exam. However, this case hardly seems to occur in practice. External qualifications are assessed by the Deputy Director for Academic Affairs and the Registrar with involvement of the respective department. In unclear cases the dean of the faculty is involved in deciding whether entrance criteria are fulfilled or external qualifications can be recognised. In this regard, a more transparent procedure is desirable, which takes into account the difficulties of this process as possible candidates from neighbouring countries come from a variety of educational systems. For checking the equivalence of qualifications, GUTech uses the database of the German "Zentralstelle für Ausländisches Bildungswesen" as a guideline.

The admission requirements of the study programmes are adequate for the study programmes. An adequate selection procedure and rules for both the recognition of credits achieved at other higher education institutions in accordance with the Lisbon Recognition Convention as well as externally achieved credits is in place. Regulations are provided for compensating disadvantages of handicapped students. Possibly planned mobility windows are integrated in the curriculum.

### **3.2 Concept**

All three study programmes share a common core curriculum (1<sup>st</sup> to 4<sup>th</sup> semester) and differentiate in specializations thereafter. The first part of the programmes aims at teaching fundamental tools and general skills of engineering. Dedicated courses in the advanced semesters account for individual training and ensure that the individual qualification aims are met. The first and second years of ME, PE, and EE build on a common curriculum across all engineering programmes offered at

GUtech. This allows students to develop a comprehensive understanding of the mathematical, scientific and engineering principles that are relevant for their further studies. During these first two years, students will also be exposed to the requirements of the profession of Mechanical Engineering and Process Engineering respectively through interaction with professionals working in industry and government (Professional Engineering II), field visits, and relevant project work (Project Work I to IV).

Common Modules in these four semesters are:

- Mathematics I to IV (each 6 ECTS-points);
- Physics I & II in the first two semesters, followed by Mechanics I & II in the third and fourth semester (each 5 ECTS-points);
- Chemistry I & II in the first two semesters, followed by Electrical and Electronical Engineering in the third and Thermodynamics I in the fourth semester (each 5 ECTS-points);
- Project Work I to IV (each 4 ECTS-points);
- Language and Cultural Skills I to IV (each 5 ECTS-points);
- Professional Engineering I & II in the first two semesters (each 2 ECTS-points);
- Introduction in Programming (3 ECTS-points) in the second semester and
- Environmental Engineering (5 ECTS-points).

Two modules of three and five ECTS-points respectively are electives depending on the choosing of PE, ME or EE.

In the semesters five to seven there are another seven modules common to all three programmes – Material Sciences I, Thermodynamics Laboratories, Language and Cultural Skills V in the fifth semester, Simulation Techniques, Measurement Techniques (Laboratories), and Business Engineering in the sixth and Research Methods in the seventh semester. Twelve modules differ according to the specializations. Whereas almost all specification modules for EE are not used by the other programmes, there are common specification modules for PE and ME: Mechanics III, and Thermodynamics II in the fifth semester, Fluid Dynamics in the sixth and Heat and Mass Transfer as well as Control and Automation in the seventh semester. Overall, students will complete 186 ECTS-points in engineering modules.

The study programmes conclude with an internship (15 ECTS-points), the Bachelor thesis (12 ECTS-points) and a Bachelor thesis colloquium (3 ECTS-points). The internship is set in this last semester. That gives the student the opportunity to combine the internship with the bachelor thesis in a company. So, in the last semester there are virtually no courses taught at the GUtech. That enables the students to take their internship not only in Muscat, but at other cities as well.

The peer group acknowledges this reasoning. On the other hand, an internship at an earlier stage would provide a useful practical background to the later courses – students could then reflect the theoretical knowledge of the courses against their practical experiences.

In the peers' opinion it is very suitable to provide the students with the opportunity to perform the fourth semester's modules "Introduction on Mechanical Engineering" and "Process Engineering" respectively at the RWTH Aachen – with the possibility to use the enhanced laboratories there. Despite the efforts of GUTech staff members to encourage all students to go abroad for either this single course or a whole semester, not all students are willing or able to go abroad.

Several reasons are given:

- Cultural reasons: some students actively choose GUTech because they seek an education matching international standards without having to leave their family and home (in particular female students are often not allowed to leave the country to study abroad);
- Students study together as a group and advance together as cohort, thus reducing the initiative for students to actively step out of line and opt for an individual study path;
- As GUTech is still a young university, there are few students who already spent a semester abroad and who can serve as role models;
- RWTH Aachen University, GUTech's main partner, offers few undergraduate courses in English.

The peer group appreciates the efforts of GUTech to promote a foreign semester, but acknowledges the limitations set by the cultural context.

As most of the graduates will find their employment in oil related industries the peer group questioned the focus on process engineering as chemical engineering would fit to a greater degree not just in the overall programme, but to the labour market as well. But, according to staff members, other competitors, i.e. four other universities in Oman, have already established programmes with a focus on chemical engineering. Therefore, GUTech has specialised in process engineering. This specialisation is also in accordance with those companies with which the Department of Engineering operates closely. This reasoning was comprehensive for the peer group.

Another aspect that the peer group concerned was the overall strong focus on mathematics that is not required to that degree in a bachelor programme with that focus. It should be discussed, whether the amount of mathematics could be reduced to more subject specific modules.

The peer group recommends the members of the Department of Engineering to shift the module "Environmental Law" in the study programme EE to an earlier semester: Environmental issues are closely linked to the institutional and legal framework so that students should not have their first – and only – module in the seventh semester.

In all other aspects the peer group is totally satisfied with the programmes described above. The competencies obtained by the students are in full accordance with the requirements of the “Framework of Qualification for German Degrees” towards bachelor degrees. The study programmes concepts cover the imparting of specialised knowledge and interdisciplinary knowledge as well as of technical procedural and generic competencies. The concepts are built up coherently in the combination of the individual modules with regard to the formulated qualification objectives and provide adequate forms of teaching and learning. The organisation of studies ensures the implementation of the study programme concept.

### 3.3 ECTS & modularization

The study programmes consists of some 48 modules. The majority of the modules cover five to six ECTS-points with the smallest having two and the largest – the internship – having 15 ECTS-points.

Several modules are not large enough to fit in the regulation that in every module the workload should be five ECTS-points at the minimum. GUTech provides ample reasoning why these modules have a lesser workload. They are:

- Introduction modules: These modules were designed to give students an introduction to the subjects. While the departmental lecturers were convinced that graduates should have a basic understanding of these topics, they were convinced that graduates will be able to independently acquire further competencies in these fields if necessary in their future work environment.
- Cover Laboratories and hands-on work: Laboratories allow the students to actively work on equipment and hence enhance the learning experience. The departmental lecturers are convinced that this is an important part of the education of our students even though the actual time spent in class as well as preparing and evaluating it afterwards might be less than in “traditional” courses. In several cases, the laboratory is based on a preceding or simultaneous “classical” module.
- Split modules: Split modules belong to other modules (e.g. the modules “Research Methods”, “Bachelor Thesis”, “Thesis Colloquium”) but were marked as individual modules to ease the advancement in studies and comply with governmental regulations

In some cases, modules could not be combined with other modules without making combinations that were unreasonable from a technical point of view. Nevertheless, experience from RWTH Aachen showed that the workload of these modules might be less than five ECTS-points. When creating the curricula, this was taken into account. The examination workload is continuously being assessed. The peer group is satisfied with the explanation above.

One ECTS-point corresponds to a student workload of 25 hours (cf. Academic regulations, point 2.5.1). Students typically register for courses with 30 credits per semester, corresponding to a semester workload of 750 hours.

The modules of the study programmes are in general mandatory. Given the number of lecturers available and the state of development of the faculty the peer group has no objections against few elective modules. However, more elective modules should be offered at the time of reaccreditation as the number of lecturers as well as students will have expanded significantly in five years.

According to the presented information and the discussion with the students the workload is fair well balanced in the opinion of the peer group. A semester at GUTech is typically divided into fourteen weeks of teaching, one exam preparation week, and two weeks of final exams. Thus, the average weekly student workload is 25–30 hours in the classroom.

Good students, e.g., with a minimum GPA of 3.0 on both semester and cumulative averages, may be considered for extended course load status which would allow the student to take credits in excess of the normal course load of 30 credits. The final decision on extended status rests with the dean of the respective faculty. Weak students on the other hand, i.e. with a semester GPA of less than 1.5, will be placed on probation which means the student can only register for courses worth 20 credits and after discussing the semester study plan with the Academic Advisor of the Department. Academic warnings shall be issued when a student fails to maintain satisfactory academic standards. For example, a student placed on probation for the second consecutive semester will be sent a warning notice.

The peer group appreciates that regulations are in place to monitor closely the students' ability to cope with the workload. A monitored adaption to the individual's need and capabilities provides flexibility and opens to programmes to excellence.

### **3.4 Teaching Methods**

The teaching methods in the various study programmes at the time of accreditation have been:

- Lecture teaching
- Case study
- Lectures demonstration
- Laboratory work
- Student directed learning
- Tutorials

The different methods of teaching are adequate and sufficiently diverse.

At the moment the laboratory equipment is under construction. This limits the students' possibilities to practice all techniques that they were theoretically introduced. One of the next moves for

the Faculty of Engineering will be the opening of an own laboratory building. Nevertheless, GUtech should reserve some money for investment in new equipment to fill the building. In the opinion of the peer group sufficient big lecture halls and laboratory spaces should be provided accordingly to the increasing number of students.

Special emphasis in the next years will be laid on blended learning techniques. GUtech aims to set up a Centre for Integrative Teaching/Learning Concepts to take charge of the operation and development of a blended learning platform. The Centre will coordinate all processes related to blended learning and will be responsible for setting up a comprehensive blended teaching and learning environment. One of the Centre's main tasks will be to install and maintain a university-wide blended learning platform, to provide information and advice on possible applications of this resource, support the development in improvement of blended learning events, and gather and disseminate information on issues related to blended learning. The aim is to complement all study courses with the use of new media. This is particularly important for block courses taught by fly-in professors where eLearning tools can provide additional information to the students before and after the block course.

As for now, all full-time academic staff members at GUtech get a comprehensive induction focussing on GUtech's student profile, while part-time or visiting professors receive a written document prior to their arrival at the university and are, upon arrival, briefed by the Deputy Rector for Academic Affairs and by academic staff teaching in the relevant programme.

This blended learning scheme naturally has certain limits imposed by the nature of the subject as well as from external factors, e.g. the Ministry of Higher Education does not allow pure distance learning courses, at least 25% of the teaching must happen on campus. Furthermore, GUtech regulations require students to attend all lectures in the classroom, i.e. attendance is mandatory.

As the teaching language is not Arabic, but English, there are mandatory courses in English to enhance the students' level of proficiency to the highest level (i.e., IELTS 7.0). Given the close ties to Germany, it is natural that the second language on campus is German. Though never used in teaching at GUtech, it is helpful for the students when visiting Germany on field trips and block courses at RWTH Aachen. Besides English and German, no other languages are taught at GUtech.

Teaching methods are in general adequate. But GUtech should provide the students with better facilities for individual learning groups. It came to the attention of the peer group that the students see learning groups as a valuable method to prepare for exams and learning from each other. However, the current facilities at the campus do not offer many accommodations except from lecture halls. As these can only be used during the time between two lectures, special learning areas would be suitable. According to the opinion of the peer group GUtech should provide learning spaces on the campus.

### 3.5 Developments since introduction

Minor changes regarding the workload of students and conduction of courses have been made to satisfy conditions which had not been foreseen in the planning of the programmes, e.g. contact hours in the course project work, withdrawal of prerequisites, slight adoptions of module's curricula to align them with the content of other courses, etc. These changes can be easily realised by the department. Major ones have to be approved by rectorate, board, and MHE.

Overall, the peer group got the impression that the study programmes are efficient and effective with regard to the expected entry qualifications, the appropriate curriculum design, and the information on the student workload, which is checked for plausibility.

## 4 Implementation

### 4.1 Resources

#### 4.1.1 Personal resources

GUtech provided some first information on concrete staff for most courses. Therefore, the targets of the study programmes, in particular the viability of the courses seems to be ensured. There are seven permanent professors at the Engineering Department, including the rector, and there are services provided by other departments (physics, mathematics), as well as one fly-in professor per semester. Courses will be taught mainly by academic staff living in Muscat and visiting professors will be invited to teach specialised courses that cannot be covered by staff at GUtech. GUtech tries to apply for a research chair in Material Process Engineering by DAAD.

In the current situation of GUtech, the fly-in model has proven to be the best way to integrate the German point of view, both financially and qualitatively. Teaching staff, e.g. from RWTH Aachen, come to GUtech to teach block courses. The department heads are in charge of ensuring that the content of the courses matches the module descriptions and that GUtech's quality standards are met. The peer group considers these additional external teachers as a suitable professional and scientific supplement to the existing core lectures. The students criticised the intensive study periods during these block courses, but – given the alternative of a only a reduced teaching staff – tolerate the inconveniences.

Being a young University, GUtech is currently not able to recruit non-professorial teaching staff (i.e., young academics or "akademischer Mittelbau"). Nevertheless, the importance to have such staff to support professors in their teaching is recognised, since it enhances the students' learning experience. Graduates from RWTH Aachen and other European universities are hence recruited as interns to support the permanent staff throughout the semester. As with the recruitment of

professors, the GUTech Aachen Office supports GUTech in hiring interns to assure the proper qualification of applicants. Since these students have already been teaching assistants at their home universities, they are suitable to do the same job at GUTech. Teaching interns work for the university for at least one semester. On arrival, they are given an introduction to GUTech regulations and procedures. Involving the interns in everyday support to teaching, especially holding tutorials and supporting labs and project work, is a powerful way to expose GUTech's students to a German (or international) viewpoint and new ideas. The GUTech Aachen Office coordinates the appointments and thereby assures the quality of the personnel recruited. The peer group endorses this idea, but feels the need to address that these internship students cannot replace research assistants. As they have given tutorials at Aachen and elsewhere their duties should be limited to such supporting tasks. It is hardly convincing that an external graduate without any research record should give lectures to students of merely the same age and experience.

All staff members at GUTech are employed according to Omani Labour Law. This means in particular that the university has to achieve a certain quota of Omani staff among its employees, the so-called *Omanisation rate*. The country's overall plan for Omanisation requires that Private Higher Education Institutions achieve Omanisation rates of 17% for academic staff and 76% for non-academic staff. Start-up projects are given a grace period until they reach the desired Omanisation rates, and GUTech has been following an Omanisation Plan to eliminate the risk of being declined the work permits. Currently, the Omanisation rates at GUTech are 12% for academic staff and 63% for administrative staff. The peer group could see that the administration staff of the Department of Engineering is rather small and – as consequence – many administrative tasks have to be done by the professors themselves. While enlarging the faculty the responsible should maintain an effective balance of professors, young academics and supporting administration. Visas issued to expatriates are always valid for two years and can be renewed. Since GUTech aims at employing staff that suits Western standards, yet has to compete within the growing sector of higher education in the Middle East and comply with Omani laws, recruiting and employing suitable permanent staff is a rather challenging task. Even "permanent" staff members are only offered renewable two or four year contracts.

Currently, 74% of the staff members teaching in GUTech's undergraduate programmes have a PhD qualification, while the remaining 26% have a master certificate (all in the Department of Urban Planning & Architectural Design). GUTech intends to retain this high ratio of PhD holders.

At the moment, the teaching load is high in relation to e.g. the RWTH Aachen. Professors teach ten contact hours/week (CH) during the semester. The amount for associate professors is 12-16 CH, lecturers and senior lecturers 20 CH, and assistant lecturer 22 CH. Heads of Departments and deans have a slightly reduced teaching load (8 CH). As GUTech and the Department of Engineering is under construction this workload is acceptable for the time being, but future developments

should lead to a reduction. Especially young academics need to have a focus on research and their PhD-thesis, which is not consistent with a teaching load of 22 CH.

In order to deliver the content and quality of the modules properly, GUtech should develop and stabilise the staff of the Department of Engineering (professors, assistance professors, lectures, technical & administrative staff). A plan for human resource development including transparent criteria for promotion of staff should be developed (call of promotions).

#### 4.1.2 Financial Resources

In the long run, the financial stability of GUtech is ensured by OES's assets, even if student numbers should drop or expenses should increase significantly. Moreover, the University's stakeholders have a commitment to ensure the long-term success of GUtech. Although a private university, GUtech is non-profit orientated.

GUtech has seen a steady growth since its founding in 2007. The tuition fees are the backbone of GUtech's finances. The fees include the cost of an IELTS and IC3 test in the Foundation Programme, and field trips if they are compulsory for the programme. As common in the Sultanate of Oman, a majority of the students receive scholarships from external sponsors. Approximately 75 % of all students receive their sponsorship by the Ministry of Higher Education. If it is required for the students to maintain a minimum grade scheme, GUtech will report their performance every semester to the scholarship provider after the Board of Examiners has finalised the grades. To support students, GUtech will advise them on issue that need to be taken into consideration, for example a course which is "In Progress", or a make-up-assessment which still needs to be completed. If the grades fall below the sponsor's minimum requirements, GUtech may suggest an alternate standard for a limited period of time to ensure that the student has the opportunity to make up any gaps in performance and expectations.

To synchronise the efforts of the university to generate additional income from research, consultancy projects and commercial training, the "Training and Smart Solutions Centre" (TSSC) was established in 2013; involvement of academic staff is governed by the Research and Consultancy Policy. Since then, TSSC has organised and managed several commercial trainings with a total value of 23,000 Omani Real for companies like PDO, VALE, and Oman Dry Dock as well as Muscat Municipality and the Ministry of Tourism. Consultancy projects were conducted for companies like PDO, Consatt, and Petrogas as well as the Ministry of Culture in Bahrain with a total value of 64,000 Omani Real. Research projects were funded by the Oman Research Council (Ecohouse at GUtech) and the Economic Research Forum Egypt (Study on female labour participation in Oman). In 2014 GUtech has intensified contacts to Small and Medium sized Enterprises (SME) to enhance consulting services.

Teachers do not control an own budget for their courses, but the departments have discretionary funds to purchase required teaching materials. Nevertheless, the transparency according the budgeting and staff planning should be increased. Each faculty should also have its own budget.

#### 4.1.3 Infrastructural Resources

The Halban Campus currently has space allocated for nine IT, two science, two engineering, and two geosciences laboratories, as well as one engineering workshop. The laboratories are (or will be) equipped with sufficient, functional and up-to-date equipment. Qualified laboratory technicians and IT staff will be responsible for the maintenance, operation, and upgrading of the equipment. Overall, the spatial resources of the university can be considered adequate but expandable. The new building of the University provides a variety of rooms to diverse uses. Some of them are temporarily used as laboratories until the faculty's own laboratory building is set up. Construction is scheduled to start next year.

The assessment of the teaching rooms reveals a modern state-of-the-art learning facility. This includes lecture halls of varying size. For teaching purposes extensive and appropriate equipment is available. The laboratories do not yet have vast and large machines, but focuses on smaller items that can more easily be moved to the new location on the campus, when the faculty's laboratory is built. The peer groups considers the existing equipment acceptable for the number of students in place, but urges GUTech to complete the new faculty's laboratory as soon as possible to provide facilities for experiments and research.

The small, but fine library contains some 18.000 volumes. Basic books in engineering are available in few numbers, but the growth rate of the library will fit to the increasing number of students. In addition, the students can make use of the RWTH Aachen's electronic library. However, access is limited to the computers in the library. It would be far more convenient for the students to have access to this electronic library from their own computer which would enable the search for books and articles from home.

Overall, the adequate implementation of the study programme is ensured with regard to the qualitative and quantitative facilities with regard to personnel, material and space. In this interdependence with other study programmes is taken into account. Measures for a personnel development and qualification are available.

## 4.2 Organisation & Cooperation

The organisation of the study programme is carried-out fully under the responsibility of GUTech, but supported by fly-in teaching staff from different European universities such as RWTH Aachen

(academic affiliation agreement, agreement on student exchange) as well as Italy (University of Brescia). There are some plans to involve the Universities of Munich and Cyprus University. The study programmes PE and ME especially make use of many levels of synergy between GUTech and RWTH Aachen, including the access to laboratories at RWTH Aachen University as well as the use of the electronic library in Germany. Nevertheless, the cooperation between RWTH Aachen and GUTech should be optimised regarding student exchange (which could be promoted through lectures offered in English within the Bachelor programmes of RWTH Aachen), staff exchange (academic and administrative), and assistance in finding internship placements in Germany.

The organisation of courses is carried-out by the head of department. However, there are no responsible persons for each course. Giving the small number of students so far a further differentiation is not yet required at this moment as the professors meet regularly. Of different concern is the communication between central and decentral level, which should be improved. A clear communication structure between rectorate, faculties, departments and administration should be developed.

In addition to these academic cooperations, GUTech has on personal base close cooperation with local companies in the Oman Oil and Gas industry (Shell, PDO – Petroleum Development Oman, Schlumberger, Oman Gas Company, OXEA) and Amiantit Oman Company LLC: PVC, HDPE pipes and fabrication products, concrete and engineered pre-cast products, Rotational molding products, Glass Reinforced Concrete applications, Glass Reinforced Plastic products, Engineering Services Division and Oil & Gas Division (rotolining, HDPE lining, trading division). Robert Bosch GmbH, Bühl offers internships for GUTech students. The TÜV Rheinland Industrie Service GmbH is interested not only in interns but graduates for the Muscat branch, too. GUTech has agreed to cooperate with Risktec – an company of TÜV – to train graduates before going to the industry. Both parts are in discussion about the content of these special trainings.

Overall, GUTech ensures the implementation and the quality of the study programmes concepts, if other organisations are involved or commissioned by the former to carry out parts of the study programme. A written record is kept of the extent and nature of existing co-operations with other higher education institutions, companies and other organisations as well as for any agreements upon which the co-operation is based.

### **4.3 Examination System**

The Board of Examiners consists of:

- a chairperson: the dean or a representative appointed by the dean. This can be the Head of Department offering the Programme of Study;

- the Deputy Rector for Academic Affairs or his/her deputy;
- at least three professors of the Department offering the Programme of Study;
- a representative of any other Department offering Courses in the Programme of Study (e.g. Language and Cultural Skills courses, Mathematics and Science courses, etc);
- the Head of Registry and Student Admissions or his/her deputy (minute-taker).

The duties and responsibilities of the Board of Examiners shall include:

- Ensure that within every examination period, examinations (and if required deferred or repeat examinations) are offered for all the Courses taught in the preceding semester;
- Evaluate whether the planning and execution of examinations is in accordance with the Academic Regulations and with the Assessment and Examination Policy, and provide corresponding feedback to the dean of the faculty and the Deputy Rector for Academic Affairs;
- Analyse situations where differences, inconsistencies or disputes arise with respect to the examination outcomes and/or examination procedures and decide on how to solve these;
- Review the final grades obtained by students at the end of each semester and forward the approved final grades for the semester to the Department of Registry and Student Admissions;
- Inform the faculty at regular intervals (at least once per year) on the general academic performance of students;
- Provide suggestions for revision and improvement of the Assessment and Examination Policy.

Most modules finish with a final exam to test the theoretical and practical knowledge of the students (summative assessment). However, continuous assessment (formative assessment) and other forms of assessments are also used throughout the semester, e.g., to ensure that the students develop and enhance relevant soft skills. The final grade is computed as the weighted average of all assessments, whereas the final examination usually makes up 50% of the grade, the on-course assignment weighting up to 40% and 10% participation is common. This one examine and continuous assessment is enforced and approved by the Ministry of Higher Education (MHE), so only minor changes can be implemented in the programmes; changes like course title, number of credit points, learning outcomes require a new approval by the MHE. Nevertheless the peer group advises the professors and lecturers to make careful and limited use of these on-course assignments; the number and frequency of these assignments has to be communicated to the students at the beginning of the courses to raise awareness of the workload. But so far, the students did not complain about this examination practice. Furthermore, this quantity of assignments

combined with the final examination assures a competence oriented examination system with a broad variation of examination.

In order to qualify for graduation, students must have achieved a cumulative GPA of at least 1.5 (equivalent to letter grade C- and percentage grade 60%). Students graduating with a cumulative Grade Point Average (GPA) of 3.5 or higher will be awarded a degree with Honours (First Class). Students graduating with a cumulative GPA between 2.5 and 3.4 will be awarded a degree with Honours (Second Class).

Overall, the examinations are module-related as well as knowledge and competence oriented. Qualification objectives can be reached by different examination formats. Every module concludes with an examination covering the entire module. Compensations are ensured for handicapped students with regard to the final performance tests and those during the studies. The examination regulations were subjected to legal verification.

#### **4.4 Documentation and Transparency**

The study programmes, course of study, examination requirements and the prerequisites for admittance including the regulations for compensating disadvantages of handicapped students are documented and published. These documents, guidelines, handbooks and regulations have been presented to the peer group and found their approval with one exception: GUtech has still to submit to ACQUIN an exemplary bachelor's certificates.

The peer group was informed that in this ongoing year a revised form of the module description is planned to be introduced to the MHE for approval. The departmental members should take this opportunity to describe more clearly the aims, objectives and learning outcomes in the module descriptions.

Several of this documents and many additional information can be found on the website, although it is still under construction. Nevertheless, the website is updated constantly, according to the testimony of the departmental staff.

In the initial years, when student numbers were still small, each student at GUtech had been assigned a personal mentor who regularly met with the student and provide individual advice on all matters related to learning. The mentor system was replaced in 2014 by an Academic Advisor system where each department has a dedicated staff member, the departmental Academic Advisor, who serves as the main contact point for all students with study related questions and problems. This position is usually filled by one of the teachers, additionally to the teaching workload. Students do not hesitate to approach the departmental staff in case of requests. Students are

aware that not only the Academic Advisor but all teachers within the departments are approachable and feel that their needs are taken into consideration. The still small number of students at GUtech enables a close relationship between teaching staff and students, assuring a good flow of information in both directions. With growing student numbers the position of Academic Advisors might become even more important and thus more time consuming. This should be kept in mind in the calculation of the workload.

Students are regularly invited to attend information events and workshops on a variety of themes such as revising for exams, coping with stress, long-term studies, etc. For example, all students attend an Orientation Day when they join the university; here they learn all important policies and rules that must be obeyed on campus, like dress code, ethical academic behaviour (plagiarism is not tolerated) classroom behaviour, library regulations, etc.

Insofar, students find advice to almost every topic concerning their studies. In addition In GUtech established a Writing Centre in 2013 where students can get advice on writing reports and theses.

Overall the peer group considers GUtech to have a considerable level of transparency. The documentation of all information necessary for the students is well done besides a certain lack of clarity in the module descriptions.

#### **4.5 Gender Justice and Equal Opportunities**

GUtech's constitution emphasises in its values equal treatment of all students, irrespective of gender, origin, ethnicity, religion, or other aspects of their person. *"GUtech is committed to ethical principles in all of its undertakings. In particular, the University welcomes students and employees from both genders, all ethnic, geographical, cultural and religious backgrounds. The University encourages association in peace and with tolerance, and welcomes further intercultural exchange between Oman and Germany"* In addition, discrimination against others is considered a non-academic misconduct and is punishable up to the termination of enrolment. The needs of disabled students are adequately addressed.

The peer group did not find any apparent gender differentiation. The given study programmes are addressed to both sexes and all students are treated equally. Therefore, the system can be depicted as just, providing the same opportunities, no matter the gender. This public claim can be verified by the fact that most students are female and are provided with equal opportunities for their prospective careers as men. Furthermore, the peer group could attest barrier-free access to all important facilities such as seminar rooms, classrooms, the library and cafeteria.

Therefore, the peer group comes to the conclusion that concepts of GUtech for gender justice and for the promotion of equal opportunities of students in special situations are implemented at the level of the study programme.

## **5 Quality Management**

### **5.1 Organisational Framework**

For a successful development of GUtech it is necessary to manage and control the quality of all processes in the university including teaching and administration. Hence a custom-made quality management system is being developed, partially supported by the German DAAD. In particular, the topics of teaching evaluation, predictive student performance assessment, and alumni networking will be included in the system.

The new quality management system is being implemented and continuously improved to ensure a dynamic and lasting quality assurance of all processes at GUtech. The system is the basis for a successful existence and growth of GUtech. A standardised quality management system will enable an efficient integration of new study programmes into the university and qualitatively assure the aspired growth. The development of GUtech's holistic quality management system is divided into four work packages (WP):

- WP1: Development and implementation of a quality management system; the Q-Wiki platform, developed by WZL in Aachen, is a first step for a comprehensive quality management system.
- WP2: Evaluation of teaching and study programmes; course evaluations are an integral part of any teaching quality control system.
- WP3: Predictive quality-assurance measures for teaching and learning;
- WP4: Development of a consultancy network for the continuous adjustment of course contents to the demands of industry and society.

The university's "Quality Assurance and Planning Department" works closely with the rectorate and the departments. Among others, it is in charge of conducting regular evaluations of both academic and the non-academic satisfaction of students. The accreditation process, both Omani and German (the latter being a voluntary step taken by the university) are considered important to provide valuable input for the further development of all study programmes. Valuable input is also expected from the "External Advisory Committee". Regular meetings of all staff members and well-defined decision making structures shall ensure that initiatives for improvement are properly assessed and implemented. An Alumni Network is currently under construction.

## 5.2 Evaluation procedures and data analysis

The quality management of teaching and learning at GUTech follows the guidelines of RWTH Aachen University. GUTech considers quality of teaching and learning as a high priority, as expressed in its Mission Statement. Quality development and quality assurance are therefore integrated into all activities of the university. The goals are to

- Provide high-quality teaching and continuously control teaching quality. To guarantee high teaching standards it is important to focus on
  - student satisfaction;
  - intensive and comprehensive tutoring of students;
  - reduction of obstacles to studying;
  - monitoring passing rates;
  - monitoring graduation rates;
  - regularly evaluating the teaching and reviewing the teaching methods.
- Educate highly qualified young academics, who are aware of their responsibility towards the economy, society, research and teaching. Integral to the qualification of outstanding young academics are
  - the provision of professional qualifications;
  - instructions providing core qualifications.
- Provide training for research, practical applications and solving problems of the future. Research and practically oriented teaching are supported by
  - aligning teaching contents with the latest research results;
  - teaching practical applications;
  - a wide range of taught subjects;
  - the attraction and retention of outstanding teachers and researchers.

The goal of evaluating teaching and learning quality is to identify the strengths and weaknesses of a course (and teacher), to increase the transparency of the teaching and learning process, and to optimise the learning and examination process. Different evaluation instruments are implemented for each course to achieve high standards of teaching and learning. The most important elements are a centrally coordinated evaluation of teaching and learning (programme evaluation), and student course evaluations.

The student course evaluation was formerly conducted by the EvaSys' programme of RWTH Aachen, but has been replaced recently by a newly developed system of GUTech. This system offers a broader range of questionnaires for different course types. The course evaluations give students the opportunity to assess the concept of a course, the didactic components, the use of media and other teaching conditions, but also to reflect on their own study behaviour. Besides, there is also

space for individual comments, special requests, suggestions and points of criticism. Each semester, teachers are given the opportunity to supplement the uniform university-wide questionnaires with subject and teacher specific questions. The findings of the student course evaluations give teachers valuable feedback for their teaching and appraisal of their courses. They can also reveal certain trends, which can lead to quick improvements of the quality of teaching. GUTech has implemented several procedures for getting feedback from students; there are also formalized complaints and grievance procedures.

Within the separate departments of GUTech the results of the student evaluation is accessible to the Head of Departments. Students do not get an official feedback of the evaluation results, but are aware that this process will benefit future students. Due to the relatively small amount of graduates there is currently more an informal feedback of graduates.

### **5.3 Mechanism for enhancing the study programme**

The process for programme review and implementation of proposed changes is clearly described. At least once in two years, the Departmental Board appoints a Curriculum Committee who monitors and reviews programmes of study. The committee's report, including recommendations for changes in the curriculum is presented to the Departmental Board for approval. In case of changes in the curriculum also the approval of the Academic Board and the MHE is required.

Results of the internal quality management procedures have been used for the further development of the study programmes. Furthermore the University meets regularly with the employers of the students to ensure a close link of education with the needs of the respective companies.

All academic staff members are subject to an annual performance review covering teaching, research, and community service. In the past, the review consisted of a survey that the teacher had to fill together with the Head of Department who also had to grade the performance. These performance reviews were then used to determine salary increases and promotions. It is planned to replace these reviews by a system of key performance indicators (KPI) where the individual achievements of a teacher are evaluated by a complex formula assigning certain values and weights to the KPIs. A proposed set of KPIs is currently under review.

A special emphasis is set of enhancing the professors' performance. GUTech's recruitment model is transparent and ensures that all appointments are outstanding. Departmental goals and expectations are explicitly defined to help new staff to be smoothly integrated. GUTech focuses on individual development of all staff by encouraging them to attend relevant workshops and conferences and supporting their research work and higher education by granting study leave, work leave, and flexible work schedules; there are also annual in-house workshops on pedagogy and teaching technology. Adequate promotion policies are in place.

As mentioned earlier, the collaboration agreement with RWTH Aachen University states responsibilities and includes a section on quality management. The Chair for Quality Management and Metrology at RWTH Aachen University supports the continuous improvement of GUTech's quality management system (cf. III.5.1).

Overall, results of the quality management of GUTech are taken into consideration in the further developments of the study programmes. These considerations include evaluation results, studies of the student's workload, academic accomplishment and the whereabouts of the few graduates.

## **6 Summary and evaluation according to the „Kriterien des Akkreditierungsrates für die Akkreditierung von Studiengängen“ (08.12.2009, version of 20.20.2013)**

The study programmes “Mechanical Engineering” (B.Eng.), “Environmental Engineering” (B.Eng.), and “Process Engineering” (B.Eng.) at the GUTech provide a good education in engineering. The study programmes orient themselves according to clearly defined qualification objectives. The structure and the content of these programmes allow the students to reach the competencies described by the qualification objectives in a feasible way. The examination system assesses the students’ progress in knowledge and competencies in a very good way. The number and qualifications of the professors and lectures fit for the study programmes. The infrastructure is suitable for the time being, but with the number of students raising the laboratories need extensions and larger equipment is mandatory. Communication within GUTech and cooperation with RWTH Aachen will certainly be enhanced in the following years given the rapid growth of GUTech and its internal differentiation respectively. At last, the quality management assures an ongoing improvement of the study programmes and their environment.

The Criteria 1 “Qualification Objectives of the Study Programme Concept”, 2 “Conceptual Integration of the Study Programme in the System of Studies”, 3 “Study Programme Concept”, 4 “Academic Feasibility”, 5 “Examination System”, 6 “Programme-related Co-operations”, 7 “Facilities”, 9 “Quality Assurance and Further Development”, 10 “Study Programmes with a Special Profile Demand”, 11 “Study Programmes with a Special Profile Demand” are fulfilled.

The Criterion 8 “Transparency and Documentation” is not fully implemented as the total module description lack a certain degree of clarity.

## 7 Recommendation to the accreditation commission of ACQUIN

The peer group advise accreditation with **conditions and recommendations**:

### 7.1 Conditions

- The number of and frequency of the on-course assignment has to be announced to the students at the beginning of each course.
- GUTech has to submit to ACQUIN exemplary bachelor certificates.

### 7.2 Recommendations

- Research activities should be given stronger support by the university.
- In the Foundation Programme professional English (technical terms) should be included in the English language courses.
- According to the increasing number of students sufficient big lecture halls and lab spaces should be provided.
- Students should be provided with space for forming learning groups.
- A plan for human resource development including transparent criteria for the promotion of staff should be developed.
- The transparency according the budgeting and staff planning should be increased.
- Each faculty should also have its own budget.
- The communication between central and decentral level should be improved. A clear communication structure between rectorate, faculties, departments and administration should be developed.
- The cooperation between GUTech and RWTH Aachen should be optimised regarding English lectures on the Bachelor level at RWTH Aachen, staff exchange (academic and administration staff), exchange of students and assistance in internship placements in Germany.
- The module descriptions should to be revised in the following way:
  - The aims, objectives and learning outcomes should to be adjusted to the actual delivered courses (as designed in the lectures in practices).
  - The professor responsible for each module should be named.
  - The duration and amount of the module examinations should be described (time, number of pages etc.).

#### **IV Decisions of the Accreditation Commission of ACQUIN<sup>1</sup>**

Based on the peer report, the statement of the university and the statement of the standing expert committee the accreditation commission took on September 29<sup>th</sup>, 2015 the following decisions:

##### **Bachelor Programme “Mechanical Engineering” (B.Eng.)**

**The Bachelor programme “Mechanical Engineering” (B.Eng.) is accredited without conditions. The accreditation is valid until September 30<sup>th</sup>, 2020.**

##### **Bachelor Programme “Environmental Engineering” (B.Eng.)**

**The Bachelor programme “Environmental Engineering” (B.Eng.) is accredited without conditions. The accreditation is valid until September 30<sup>th</sup>, 2020.**

##### **Bachelor Programme “Process Engineering” (B.Eng.)**

**The Bachelor programme “Process Engineering” (B.Eng.) is accredited without conditions. The accreditation is valid until September 30<sup>th</sup>, 2020.**

For the further development of the programmes the following recommendations are given:

- Research activities should be given support by the university as much as possible.
- In view of the increasing number of students sufficiently large lecture halls and lab facilities and equipment should be provided.
- Students should be provided with space for forming learning groups.
- A plan for human resource development including transparent criteria for the promotion of staff should be developed.
- The communication between the central and decentral level should be strengthened such that the study programmes can be carried out properly.
- The cooperation between GUTech and RWTH Aachen should be optimised regarding lectures in English on the Bachelor level at RWTH Aachen, staff exchange (academic and administration staff), exchange of students and assistance in internship placements in Germany.

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<sup>1</sup> According to cl. 1.1.3 and cl. 1.1.6 of the “Rules for the Accreditation of Study Programms and for System Accreditation” of the Accreditation Council only the peer group evaluates the compliance of the study program with the criteria of the Accreditation Council. However, certain defects and critical remarks addressed by the peer group can be revised by the statement of the HEI to the evaluation report. On the other side, the Accreditation Commission can decide on new conditions based on their general perspective and/or reasons of consistency with previous accreditation decisions. Insofar, the decision of the Accreditation Commission can deviate from the accreditation recommendation made by the peer group.