

**Accreditation Report**

**Reaccreditation at the  
German University of Technology in Oman  
Study Programmes  
“Applied Geosciences” (B.Sc.)”, “Computer Sciences” (B.Sc.) and  
“Urban Planning and Architectural Design” (B.Sc.)**

**I. Procedure**

**First accreditation on:** June 23rd, 2009 through: ACQUIN, until: September 30<sup>th</sup>, 2014, extension of accreditation until September 30<sup>th</sup> 2015 after submission of the self-report

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

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

**Date of the on-site visit:** March 2<sup>nd</sup>-3<sup>rd</sup>, 2015

**Standing Expert Committees:** “Mathematics and Natural Sciences”, “Architecture” and “Computer Science”

**Attendance by the ACQUIN Office:** Marion Moser

**Accreditation decision:** September 29<sup>th</sup>, 2015

**Members of the Peer Group:**

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- **Professor Dr. Gregor Borg**, Martin-Luther-University Halle-Wittenberg, Institute for Geosciences and Geography, Economic Geology and Petrology Research Unit
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- **Professor Dr. Ulf Schreier**, University of Applied Sciences Furtwangen, Faculty of Business Informatics
- **Lena Marike Wellmann**, Student of "Architecture" at the Technical University of Berlin

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), students.

**Evaluation criteria** have been the "Decision Rules for the Accreditation of Study Programmes" (Resolution of the Accreditation Council of 08.12.2009, last amended on 20.02.2013)

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## II. **Introduction**

### 1. **Short Profile of the German University of Technology in Oman**

The German University of Technology in Oman (GUtech) is one of seven private universities in Oman and was founded in 2007 as a private independently operating university associated with RWTH Aachen. (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.). 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 conditions and tasks of both parties. OES is a company which is registered at the Ministry of Commerce and Industry in Oman with the purpose of running the University.

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

In the first years GUtech was located at its temporary campus in Muscat. Due to growing student numbers GUtech moved in September 2012 to a new campus, located in Halban. The new campus takes into account the growth of the university over the next decades; the facilities built in phase I (the main academic building and the three dormitories) are sufficient to accommodate 2000 students, and it is planned to enlarge the facilities in such a way that 20.000 students can be enrolled in the different study programmes at GUtech.

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. Additionally, GUtech has six departments: Applied Geosciences, Computer Science, Engineering, Mathematics and Sciences, Sustainable Tourism and Development, and Urban Planning and Design.

In total nine study programmes (eight Bachelor and one Master programme) and in addition a pre-university programme (intensive English programme and academic foundation programme) are offered. The teaching language at GUtech is English; additionally, German is taught in order to provide students with a basic knowledge facilitating the intercultural student exchange with Germany.

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.

In the winter semester 2008/09, the first students were enrolled in the three Bachelor programmes "Applied Geosciences" (B.Sc.), "Computer Sciences" (B.Sc., former title "Applied Information Technology") and "Urban Planning and Architectural Design" (B.Sc.). In 2011 the first enrolment took place in the study programmes "Mechanical Engineering" and "Process Engineering", 2013 the first students started in the study programme "Environmental Engineering".

The number of students has increased over the last years up to 1134 students in 2014/15. The increase in total enrolment reflects the growing reputation of GUtech as well as a high demand for its study programmes. The number of employees was 2014/15 173 in total (75 academic and 95 administrative).

The university is a non-profit organisation but needs to cover its expenses on its own. For all study programmes tuition fees are therefore mandatory.

For the programmes "Computer Science" (B.Sc.), "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. The tuition fees for the degree programmes "Applied Geosciences" (B.Sc.) and "Urban Planning and Architectural Design" (B.Sc.) amount to 2880 OMR/3750 OMR (Omani/non-Omani students), and 2700 OMR/3750 OMR (Omani/non-Omani students) respectively.

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

The study programmes are offered by the Faculty of Mathematics and Science (Bachelor programme "Applied Geosciences"), the Faculty of Engineering and Computer Science (Bachelor programme "Computer Science") and the Faculty of Urban Planning and Architectural Design (Bachelor programme "Urban Planning and Architectural Design").

In "Applied Geosciences" currently 89 students, in "Computer Science" 29 students and in "Urban Planning and Architectural Design" 23 students are enrolled.

## **3. Results of the first accreditation**

The study programmes "Applied Geosciences" (B.Sc.), "Computer Science" (B.Sc.) and "Urban Planning and Architectural Design" (B.Sc.) were accredited on June 23<sup>rd</sup>, 2009 without conditions. For the further development of the programmes the following recommendations were given:

Applied Geosciences

- Only a few fundamental lessons should be given by fly-in professors. These block courses should not be held in too short time spans (more than one or two weeks) to prevent overburdening of the students.

#### Computer Science:

- The course "Formal Systems" should be more practically oriented
- The "Technical Computer Science" course should be renamed. This term is not used in the English speaking world to denote the subject of the course at hand nor does this phrase occur as title of a corresponding text book.

#### Urban Planning and Architectural Design

- The fields of history and theory in the curriculum should be amended to include the theory and history of architecture.
- Specific subject-related options should be given more space in the curriculum.
- With regard to interdisciplinary cooperation, the synergies with other planned study programs of GUtech should be strengthened. This applies especially to the study program 'Sustainable Tourism and Regional Development'.
- During the setting-up phase, the students should be confronted with additional Lecturers and Professors. ('Fly-in' teachers and public guest lecturers.)
- The planning of the new campus should pay special attention to the students' workplaces. (Sufficient in number, adequate opening times, a separate entrance and security.)
- The faculty should influence the structure and didactic of the Foundation Year to a greater extent. Especially, a 'division' of the Foundation Year between basic scientific subjects and subject-specific contents referring to the individual field of studies chosen by the student should be carried out.
- The university should state more precisely the items of article 5 in the Diploma supplement ('Professional Status').

### **III. Evaluation**

#### **1. Objectives of GUtech and its faculties**

GUtech's superior objective is to become the 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, therefore teaching and learning should be based in research and practical experience. The university aims to provide a high quality scientific and technologic state-of-the-art education which meets the needs of the students, as well as the needs of the Sultanate of Oman and the wider region. Graduates of GUtech should be prepared for a rapidly changing and culturally-diverse working life. Thus they should have not only detailed knowledge in their chosen subject, scientific-theoretical and analytical skills and good methodological competences, but should also have the ability of critical and creative thinking in order to explore new and innovative solutions for complex problems, to cope with new challenges and to work in an interdisciplinary environment.

As the Ministry of Higher Education (MoHe) approves all study programmes at GUtech, only minor changes can be implemented in the programmes; changes such as of course title, number of credits or learning outcomes require a new approval by the MoHe.

The peer group considers the overall objectives of GUtech positive, the objectives are in general in accordance with the relevant Omani and German regulations (e.g. Criteria for the Accreditation of Study Programmes (resolution of the Accreditation Council of 08.12.2009, last amended on 20.02.2013)) and qualification frameworks. The aims and intended learning outcomes of the programmes are consistent with the type and level of studies and the offered qualification level.

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.

### Involvement into Society and Personality Development

GUtech is strongly committed to ethical principles. Besides knowledge and competencies linked to the specific subjects of study, students should also acquire competences which are summarized as soft-skills and personal competencies. They should be able to develop their own ideas and ethical as well as social responsibility and to work in an intercultural work environment. Moreover students should acquire skills in self-management and team work. A good knowledge in Oman's culture and heritage should support their contribution to the further development of Oman and its society. In that regard, the pre-university "Foundation Programme" provides students with professional and study skills, in the Bachelor programmes the modules "Language and Cultural Skills" promote communication skills, ethical issues and intercultural competences.

### Gender Justice and Equal Opportunities

One important principle at GUtech is the no-discrimination policy which is stated in its values: "*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*"

GUtech's concepts of gender justice and equal opportunities are fully implemented at the level of the study programmes.

Students with special needs are provided with additional services and facilities. GUtech's campus is barrier-free and special examination arrangements are made in individual cases. The facilities at GUtech are accessible by wheelchair. Regulations for students with special needs are implemented in the "Assessment and Examination Policy". For students with disabilities and students with disadvantages individual solutions are found (special examinations, special mentoring). The gender ratio shows a male : female ratio of 25% : 75% in the study programmes. A similar ratio can be observed in most other universities in the region.

### Recognition of credits / qualifications achieved at other higher education institutions

The recognition of credits or (entrance) qualifications of other higher education institutions or of prior experience (advanced standing) is regulated in the "Academic Regulations". Theoretically, students coming from other schools/higher education institutions 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, that

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.

## **2. Overall structure of the programmes, ECTS and modularization**

All Bachelor programmes have a regular study period of four years in which 240 ECTS credits are obtained. The track "Language and Cultural Skills I-V" (24 credits) teaches German language and culture. This is one of the trademarks of the Bachelor programmes and of GUtech as a whole, since the students are encouraged to spend a semester at RWTH Aachen or even continue with a Master programme there or at other universities abroad.

In the "Language and Cultural Skills" courses first year students can only take German classes if they show a good command of English. Students who still need to improve their English will have English classes in the first year and start the German courses in their second year. The peers were impressed by the abilities of students to express themselves and to communicate in English.

According to the discussions with representatives of the study programmes it seems that the organisation of the "Language and Cultural Skills" courses sometimes collides with the schedule of the Bachelor programmes. For example, it seems difficult to organise field trips in AGEO because of the five hours of classes per week in the "Language and Cultural Skills" courses, which are spread over three days. During the discussions the suggestion was made by the GUtech staff to offer these courses as electives and to use the credits for subject-specific classes. The peer group sees the issue from both perspectives: on the one hand the term "German", which is part of the name of the university, should be reflected in the curricula and the students should be familiar with German culture and the German language, understand diverse cultural issues and be able to apply their cultural understanding; on the other hand more credits for subject-related classes would strengthen the subject-related skills. This issue should be discussed within the GUtech.

In all Bachelor programmes an internship is mandatory. It should provide students with insight into practical work. An internship report must be handed in after successful completion of the internship and a presentation including a discussion is requested. The report and the presentation are both evaluated by the internship supervisors from GUtech and by the company. The Bachelor thesis (12 credits plus three credits for the colloquium) is written in the last semester.

All programmes are completely modularised. One credit is equivalent to 25 hours of workload of the students. Some modules comprise less than five credits, reflecting their workload and content; to the peers creating bigger units seems not always appropriate according to the content of modules and would also lead in some cases to unreasonable combinations. For each study programme a well elaborated module handbook is available which provides students with the information

about e.g. workload, learning outcomes, course summary, syllabus, forms of assessment, requirements for passing the course, pre- and co-requisites, and recommended literature.

In the design of the study programmes a variety of legal regulations, guidelines and recommendations have been considered, such as the Qualifications Framework for German Higher Education Qualifications and the Omani National Qualifications Framework, the rules and regulations of the Ministry of Higher Education, the ECTS Users' Guide, the European Framework for Life-Long Learning, the rules of the German Accreditation Council and the Common Structural Guidelines of the Länder for the Accreditation of Bachelor's and Master's Study Courses (resolution of the Standing Conference of the Ministers of Education and Cultural Affairs).

## **2.1. Admission requirements**

Aside from a standard high school degree (General Education Diploma of the Sultanate of Oman or an equivalent secondary school education) a prerequisite for admission to the Bachelor programmes is a good mastery of the English language as testified by an IELTS score of at least 6.0 with no band below 5 or an equivalent TOEFL score. As this requirement is not met by most Omani high school graduates, students enter the pre-university programme called "Foundation Programme" (Academic Study Skills Programme), provided they can demonstrate an IELTS-score of at least 4.5. If their score is even lower, the Foundation Programme may actually be preceded by yet another pre-foundation programme – the "Core Study Skills Programme" – to improve language skills of students.

Besides English other courses are also part of the Foundation Programme. These are courses on Physics, Mathematics, Information Technology and general skills courses like Creative Design. These are meant to prepare students for an academic environment. Moreover they familiarize the students with a mode of studying less based on memorization and recitation, but rather on critical reflection and discussion. The programme helps students to be trained to work scientifically: to challenge data and points of view, to try finding answers on their own and finding the right arguments for their own hypothesis. The discussion with the students illustrated the success of this training.

The peers recommend also to also include professional English (technical terms) in the "Foundation Programme", in order to familiarise students already in the beginning with subject-specific English. The structure of the Foundation Programme is currently discussed within GUtech and there are plans to revise it.

When entering the Foundation Programme students must already decide on their future Bachelor programme. A side effect of the foundation studies is that students are enabled better to estimate, whether the intended study programme fits their skills. Passing the relevant stream in the Foun-

dation Programme or an equivalent qualification is then a prerequisite for admission in the respective Bachelor programme. The admission requirements and conditions are described in the "Academic Regulations" but could be made more transparent to the students; it seems that especially the bridge between Foundation Programme and the chosen Bachelor programme was not always completely comprehensible for them.

Most Omani students who apply for a Bachelor programme at GUtech are centrally assigned to GUtech by the Higher Education Admission Center (HEAC). Thus GUtech can decide on the general number of students in each programme, but it is not allowed to actively select the best students – all students meeting the general entry requirements have to be accepted.

It should be emphasized that an evaluation of the "Foundation Programme" has not been part of the present accreditation process. Nevertheless, the peers could convince themselves in discussions with students and with the teaching staff, that the goals of the "Foundation Programme" are generally achieved, so that the admission criteria serve their qualitative purpose.

According to the peers the admission requirements and the selection procedures are appropriate for the study programmes. Rules for the recognition of credits achieved at other higher education institutions as well as externally achieved credits of prior experience are in place.

### **3. Documentation and transparency, student support**

All necessary information on the study programmes is well documented. General information on the programmes, requirements for the admission and admission procedure, skills and contact persons is transparent and accessible to students and the public in the net. A student handbook is given to students on enrolment which provides information about, e.g., the academic calendar, academic counselling, study programmes, contact details of staff, learning support, facilities and resources, student code of conduct. Detailed course catalogues provide valuable information for students. Required legal documents such as final grade certificate and transcript of records are contained in the self-report of the study programmes.

The members of the peer group had the opportunity to meet representatives of the students from the different study programmes. The experts gained the overall impression that the students receive very good support from the GUtech and its staff. On the central level the Registry and Student Admissions Department provides service on matters related to eligibility, entry requirements, programme content and structure etc. Academic advisors are the contact persons for students in the departments for study related questions and problems. All staff members show a high engagement in student support and counselling.

For students regularly information events and workshops on a variety of themes such as preparing for exams, coping with stress, etc. are offered. In the Writing Centre students can obtain advice on writing reports and theses. Also small group tutorials are offered for students. GUtech's Career

Corner provides a wide range of career services to students and alumni, e.g., career advising service, career week, career fair, workshops.

According to the peers the student support services cover all relevant stages of the student life cycle and give appropriate assistance to students.

#### **4. Resources, organisation, decision making processes**

##### Resources

All staff at GUtech are employed subject 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 are required to reach the desired Omanisation rates, and GUtech has been following an Omanisation Plan to eliminate the risk of being declined work permits. Currently, the Omanisation rates at GUtech are 12% for academic staff and 63% for administrative staff.

Visas issued to expatriates are always valid for two years and can be renewed. Since GUtech aims at employing staff matching Western standards, yet has to compete within the growing sector of higher education in the Middle East and to 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, while the remaining 26% (all in the Department of Urban Planning and Architectural Design) have Master's degree. The University intends to retain this high ratio of PhD holders.

The organisational framework and qualification conditions for the teaching staff for the study programmes follow high university standards and are therefore entirely sufficient. Joint GUtech-RWTH recruitment committees hire associate and full professors according to standards of RWTH Aachen. Applying the same standards, GUtech recruitment committees hire assistant professors and lecturers locally. All teaching staff is well qualified and the experts have been highly impressed by the strong commitment and motivation of GUtech staff.

The teaching load for professors is ten contact hours per week, for associate professors twelve and for assistant professors 14 to 16 hours. Lecturers have to teach 20 to 22 hours. Previously the teaching load of professors and lecturers was between 8 to 16 hours per semester, since the winter semester 2013/14 the teaching load of newly hired staff has been adjusted so that the university can allocate higher teaching loads to newly hired staff. The increase of teaching obligations could have negative effects on the recruitment of new staff members. Therefore GUtech

should take this aspect in consideration for its overall personnel policy. This poses a particular challenge, since high or even increased teaching loads compete with or are an obstacle to scientific research output as will be discussed below.

In the future more research will be expected from the entire staff. Here the total workload of the staff has to be evaluated, because they also take over administrative duties, moreover they are very engaged in supporting the students. In particular overloading staff members with teaching duties beyond their contractual obligations (which has been the case) must be avoided. Counselling and supervision of Bachelor theses also should be considered in the workload calculation. Opportunities for research time such as research sabbaticals should be discussed within GUtech. With regard to the future planning of GUtech (and the promotion of research) plans for human resource development (with criteria regarding career paths for academic staff) and career-planning meetings should be established at GUtech on a regular basis and should also be documented. It might become particularly difficult to recruit international qualified staff for temporary contracts if insufficient time for research and career-planning is given due to a high teaching load.

According to the self-report the university already encourages staff members to attend scientific and educational workshops and conferences. Research work and higher education are supported by granting study leave, work leave, flexible work schedules, and funding support. However, the peers are under the impression that the wording of the self-report and everyday life at the university are sometimes at odds. This might be caused by the fact that the university is still in a transition phase

With the new building on Halban campus the facilities for teaching and learning have improved significantly. The main building offers good working conditions. The Halban Campus currently has space allocated for nine IT, two science, two engineering, and two geosciences laboratories, as well as one engineering workshop. However, taking into account the increasing number of students, the lecture halls are relatively small and it is predictable that their capacities will soon be inadequate. If the courses should be taught in bigger classes, bigger lecture halls should be provided. Additionally lab facilities and equipment should be improved.

The financial stability of GUtech is ensured by OES's assets. The tuition fees cover part of the operational costs, it is expected that the break-even point is reached in about two to three years.

#### Organisation and decision making processes

GUtech shows a well elaborated governance structure which is determined by the following bodies:

*On the central level:* Board of Directors of Oman Educational Services LLC (OES), Board of Governors, Rectorate, Academic Board, Academic Committee,

*On the faculty level:* Faculty Board, Department Board, Department Curriculum Committee

*On study programme level:* Board of Examiners, External Advisory Committee

External advisory committees have not yet been established in all programmes. The peers recommend implementing such committees in the near future in order to provide a formalized link between teaching and practice.

The management structure is appropriate. With the different boards and committees within the university it should be ensured that everybody within GUtech is informed and integrated into its further development. However during the site visit the peers got the impression, that this structure is not fully implemented and alive. Due to changes in personnel there is a lack of transparency and information within the university. The interfaces of the collaboration and the communication between the rectorate/administration and the departments/faculties should be carefully inspected, and the communication channels as well as the coordination between central and decentral levels could be organised more efficiently. For example, the situation of the central/decentral documentation of the examination marks, grades and the registration of students should be clarified, the communication between the faculties and the examination office should be improved. GUtech should therefore develop a coherent communication structure between rectorate, faculties, departments and administration. The peers suggest regular meetings of the heads of the departments in order to pass on the same information to everybody. Regular meetings between the head of departments and the management should be held on a regular basis. Moreover the transparency concerning budgeting and staff development should be increased. It is highly recommendable that each faculty should have its own budget, which currently does not seem to be the case. For a young university it is very important to work on the information flow in order to make processes and responsibilities more transparent for all team members.

Students are institutionally involved through the Student Council. In each department the students elect representatives for the Student Council according to a quota set each year by the Rectorate. The president of the Student Council is a member of the Academic Board.

#### **4.1. Examination system**

The examination system is well organised. All assessment regulations are clearly described in the "Academic Regulations" which have been approved by the Board of Governors. The examination regulations were subjected to legal verification. The framework of GUtech's examination procedures is also regulated through the "Assessment and Regulation Policy". Within the study programmes a broad range of assessments forms is used, e.g., written and oral examinations, project work, presentations, field and lab reports, and graded homework. Failed exams can be repeated twice. All exams are related to single modules and they test competencies as well as knowledge. According to the educational background of the students their progression is continuously assessed

to ensure that the students develop and enhance relevant skills and that they obtain a permanent feedback regarding their performance. Through the final module exam it is tested whether the defined learning outcomes are achieved. The types of assessment as well as the weighting and requirements to pass a course are stated in the respective course descriptions. The final grade is usually computed as the weighted average of all assessments. As soon as the size of the cohorts is large enough, a relative grade (grade distribution table) should be provided in addition to the final grade (absolute number).

In general, the examination system is suitable and the chosen methods of examination are balanced. The peers assess the examination system of the study programmes as appropriate, the different examination forms provide the opportunity to assess different competencies.

#### **4.2. Cooperation**

The framework for the cooperation between GUtech and RWTH Aachen is established through an affiliation agreement. RWTH Aachen supports GUtech in the design and implementation of new study programmes (which need to be approved by RWTH Aachen first), in the implementation of an overall quality management system and offers its services and equipment to GUtech's staff. To the peers, the synergy of the cooperation with RWTH Aachen appears not sufficiently transparent and evident; it probably could be handled more actively by RWTH Aachen. As a consequence, the cooperation between RWTH Aachen and GUtech should be optimized 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.

## 5. **Applied Geosciences**

### 5.1. **Objectives of the study programme**

The study programme “Applied Geosciences” (AGEO) focuses on the three key fields energy, water and mineral resources. It provides students with basic knowledge of natural sciences like mathematics for earth scientists, chemistry and physics and a broad geological knowledge which is complemented through more specialized courses in the field of hydrogeology and petroleum geology. According to the self-report key emphasis is placed on specialisations in “Petroleum Geology”, “Hydrogeology” and “Mineral Resources Geology”. Students should have a sound knowledge in all three areas so that they can work in the private, governmental and non-profit sector.

The discussion with the students showed their good command of the English language. They are able to present their personal point of view in qualified discussions. The personal development of the students benefits from excursions to universities in Germany like Aachen or Erlangen.

The curriculum contains courses in all essential areas of expertise, which are indispensable to for comprehensively educated graduates in the area of geology. This enables them to work effectively as geologist especially in the fields of petroleum geology, hydrogeology and mineral resources. At the moment nearly all graduates find jobs in the petroleum geology sector, especially in national Omani petroleum companies, or ministries. Others start with a Master programme. However, with the expected increasing numbers of graduates not all future graduates will be able to enter the field of petroleum geology and will have to find jobs in the area of hydrogeology and mineral resources. Therefore additional efforts should be taken to consider this in the Bachelor programme. For example, the basic skills in geographical information systems (e.g Esri ArcGIS or open sources systems such as QGIS) should be improved to qualify students better for areas of hydrogeology and mineral resources. It is planned to offer also additional lectures in the area of petroleum geology; which will provide the graduates with better chances to access more specialised sectors of the petroleum geology industry. So far, most of the Omani graduates found jobs on the Omani job market.

The current number of students which can be enrolled ranges between 20 to 40 students per year. In the future an increase up to 80 students is planned. The peers are critical of this plan, since such a high number of students cannot be handled in a laboratory and hands-on orientated discipline such as AGEO. Even shifts of students could not be accommodated by the limited staff and facilities. Additionally, it seems unrealistic that the job market could absorb such a high number of graduates.

The skills of the GUtech Bachelor students in “Applied Geosciences” can be seen as equivalent to German standards in comparable Bachelor programmes. However, interdisciplinary or lateral

thinking could be strengthened in the programme. Compared to the first accreditation the objectives have not changed substantially and are still appreciated by the peers. The content of the programme has changed only slightly. The study programme "Applied Geology" is well positioned within the GUtech. Moreover, the formal employability of graduates is uncontended and the acquired competences are suitable for a wide range of professional applications. Graduates work in Petroleum Development Oman (PDO) or other oil companies in Oman, which shows that the defined objectives are valid and achieved. However, taking into account the future labour market of Oman, the area of hydrogeology and mineral resources should be further strengthened in the curriculum to improve the job perspectives. All in all a distinct progress in the quality of the study programme is obvious compared to the results of the last accreditation, the increase of permanent staff had a very positive impact on the curriculum of study programme.

## **5.2. Concept of the study programme**

### Structure, ECTS and modularization

The admission criteria are mainly based on the successful completion of the Foundation Programme for Omani students and on the equivalent qualifications of foreign students. At the moment the consolidation of the Bachelor programme is still in progress due to the fact that nearly all students passing the Foundation Programme get admission to the Bachelor programme. With the prospectively expected increasing applications for the study course "Applied Geosciences" and the limited number of places the qualification of new students is likely to increase.

The Bachelor programme follows a clear structure. In the semesters 1 to 4 the basic knowledge in natural sciences and geology is acquired, advanced and more specialised modules are subsequently offered in semesters 5 to 8. The programme only comprises compulsory modules, for the future some elective modules are planned. The credits are distributed as follows:

- 186 credits for the core courses
- 24 credits for the "German and Language and Cultural Skills" courses
- 15 credits for the internship
- 12 credits for the Bachelor thesis and 3 credits for the colloquium

The programme focuses on the basic understanding of geological principles and the fundamentals of mathematics, chemistry and physics. This is appropriate for a Bachelor programme in Applied Geology. With respect to the defined objectives the curriculum puts slightly too much emphasis on sedimentological and tectonical contents at the expense of and less on applied topics such as applied geology or consultancy work.

Considering the changing job market, the peers strongly recommend to strengthen aspects of hydrogeology and mineral resource geology significantly within the curriculum. This could be done within the existing curriculum and its courses by implementing small modifications. Geology-oriented GIS should also be integrated as the current GIS-education is apparently not really suitable and sufficient. It is advisable to integrate these GIS courses in the second and third semester. To allow an individual specialisation of the students electives are a desirable component which could be integrated into the curriculum in semester 5 and 6. Particularly an elective in "Petroleum Engineering" should be established for higher semesters of AGEO. As a mid-term strategy this could subsequently be developed into a Bachelor programme of its own. For the preparation and writing of the Bachelor thesis a module "Scientific Writing and Reading" is currently offered in the fourth semester. This indicates that writing skills are much needed. These skills should therefore also be further strengthened and constantly supported throughout the programme.

In general the modules are adequately designed. The size of modules ranges generally from 3 credits to 15 credits (internship) depending on the real workload. There are two modules with a smaller size (Communication and Presentation and Geosciences Seminar), which reflects the workload. At the moment is not planned to have a standard module size of 5 credits. For the next revision of the curriculum it is recommended to increase the size of the modules, so that only a small number of modules are smaller than 5 credits.

In general, the workload is appropriate and evenly spread over the semester. Most of the graduates finish the programme in the prescribed period of study. Specialised topics are taught in block courses by fly-in professors, currently such courses last one week and are therefore very concise. This puts high pressure on the students. The peers recommend to extend the duration of the block courses to give students more time for reflection and to reduce the work pressure. The peers noticed that there is no information flow between the fly-ins or drive-ins and the head of the study programme on what is taught and if and how this is in accordance with the module descriptions and learning outcomes. The peers strongly recommend to improve the integration of fly-in and drive-in professors in the teaching process of the programme. They should provide a teaching concept and a description of the content of their lectures.

### Teaching methods

The modules contain the following teaching forms: lecture, exercises, group work, computer lab, tutorials, presentations, field work. Field work is taught in excursions (3 excursions with 9 credits in total). As field work is an essential topic in geological education the share of field work should be extended.

All students have to do an internship to apply theoretical knowledge and to give them a first insight in the job market. With regard to didactical methods, the peer group sees a deficit in practical training on certain software tools in GIS. It is also obvious that workplaces for practical

training like laboratory work will be insufficient if admission numbers are increased as planned. In general, to the peers the form of teaching and learning are adequate for the defined learning outcomes.

#### Changes to the curriculum

There have been only minor changes in the curriculum since the last accreditation. The recommendations of the first accreditation to incorporate more lessons dealing with really applied geological content have not been implemented. Although this is understandable from the historical development of GUtech, other disciplines besides oil-related palaeontology and sedimentology such as mineral resource, hydrogeology and engineering geology should be strengthened within AGEO. In general the curriculum is appropriate, the defined objectives can be achieved with the curriculum and the qualification of graduates is comparable to German standards in Applied Geology programmes.

### **5.3. Implementation**

#### Resources

According to the information given in the self-report four full-time lecturers are presently involved in the study programme "Applied Geosciences". According to their academic and professional experiences, the pedagogical and teaching qualifications of the AGEO staff are in line with their tasks and meet the requirements of the programme.

Since the last accreditation a large number of former permanent staff have left the university. This caused an increase of the workload (and thus: an overload) for the remaining two permanent staff members. With the recruitment of two more staff members in the field of mineral resources and hydrogeology the number of permanent staff increased to four professors.

Also senior scientists retired from their positions in Germany have joined the AGEO programme. In addition fly-in or drive-in professors hold lectures on special topics. Due to the increased staff number more persons are involved in teaching and – as a consequence – the peers highly recommend to establish regular staff meetings (jour fix) to discuss all issues of teaching, labs, field courses and research.

Technicians responsible for the labs are still missing. A lab technician should be trained and employed. Optionally, this could be an own B.Sc. graduate sent for training abroad and employed subsequently in AGEO.

For supporting students in finding internship placements sub-contractors to Petroleum Development Oman, such as Schlumberger, could be contacted and targeted for internships and as potential future employers. Moreover, an industry liaison person should be identified within the AGEO staff to actively contact all relevant oil and mineral exploration companies to establish an internship and employment relationship. This could be done, e.g., by including invitations for “open-house” events and “industry-meets-students” events.

To increase financial resources, geological field trips for tourists could be organized. Consulting work would also provide further financial resources and would strengthen links to industry and future employers for the graduates.

The infrastructural resources should be enhanced, lecture rooms, particularly for laboratory and hands-on classes are already insufficient and can certainly not cope with expected 80 new first year students. At the moment the Geological Department and the Department of Mathematics and Chemistry use the same laboratory space. In the chemistry lab which is shared with the Faculty of Chemistry there are only 16 places available, in case of increasing student numbers lab places have to be increased accordingly. New laboratories are planned which shall be used together with the Department of Mechanical Engineering. If the promised cross-faculty laboratory facilities are implemented (based on the new chair Material Process Engineering), it should be made sure and checked that the AGEO laboratory requirements are incorporated and taken care of. The number of 8 optical microscopes (for thin sections) should be slowly increased to at least 12. Ideally, a small set of teaching ore microscopes with reflected light set up (4 to 6) should be purchased.

The teaching collection should also be extended in the number of sets of standard rocks and minerals (international purchase) but particularly with respect to Omani rocks and minerals. The latter can be done by the Geo-staff by collecting rock, ore and mineral specimen in Oman during field trips. Thin and polished sections can be made by sending cuttings abroad. It would be desirable to have 20 to 24 identical sets for the groups to work on (10 to 12 as minimum if groups of two students use the material in classes).

There is sufficient literature available on the basic fields of geology (petrology, structural geology, tectonics, and sedimentology). The students have access to a large amount of course books on petroleum geology, but literature on hydrogeology, engineering geology or GIS is currently missing. The library should be updated in this field. Databases available at the RWTH Aachen can be accessed at GUtech.

### Examination system

The number of exams is acceptable. Usually exams consist of homework assignments, field reports, in some cases a mid-term exam and a final exam at the end of the term (mostly written exams). All necessary information on the examination requirements are made available for the

students at the beginning of a term. In general, the examination system is suitable and the chosen methods of examination are in accordance with the defined learning outcomes.

## **6. Urban Planning and Architectural Design**

### **6.1. Objectives of the study programme**

In the study programme “Urban Planning and Architectural Design” (UPAD) students should be able to acquire competencies for positions in the area of urban planning and architecture, including a sound knowledge of urban design, architecture and building construction. They should be able to apply them in practise thus integrating future demands of the society. Structural changes in economics, environment, society and culture result in comprehensive challenges for future generations. Therefore graduates should be able to cope with regional major challenges that are a result of economic growth and population growth and to design an environment which is “social, spatial, ecological and economically sound” (self-report p. 18). Students should be able to handle complex problems, to find and implement sustainable and creative solutions, to take on responsibility in their future professional life as an architect or as an urban planner, to anticipate new tasks and to develop strategies for the local environment and its sustainable development. It is therefore consistent that the Faculty UPAD offers a comprehensive coaching that aims to enable students to take over a high responsibility in their following profession as architect or urban planner in the private as well as the public sector. Students should be also qualified to continue with a Master programme.

The objectives of the programme are divided into the three categories design, knowledge and communication. This is the educational framework within which the required competences, skills and knowledge are to be achieved to prepare for a successful future professional life. These are, e.g., responsibility, critical, creative and integral thinking, individual and team work, scientific-theoretical working, interdisciplinary working, life-long-learning.

The study programme’s objectives are formulated according to international standards which meet local requirements and are evaluated positively by the peers. In the view of the expert team the learning outcomes are well defined, and the study programme has a distinct profile. Modules are designed adequately and have a clear progression. Since the last accreditation the objectives have not changed significantly and are still valid. Graduates work in government bodies (e.g. Ministry of Housing), large construction and consulting companies in local design and architectural firms. The UPAD Department has kept a close relationship to its alumni students. This relationship enables an informal way of feedback on the programme as well as on requirements of the labour

market. For the further development of the programme the faculty should establish co-operations with other GUtech faculties e.g. with the Faculty of Engineering.

The programme has a capacity of 35 places, 32 to 40 students begin their studies each year. The study programme is very attractive to Omani students because of its potential career paths and because of the reputation of the profession within the Sultanate of Oman. Additionally the UPAD Department is involved in public projects, consultations and research which promotes the attractiveness of the Bachelor programme as well. There are plans to double the number of students, if this is to happen, staff and facility capacities must be adapted. As of winter semester 2014, 99 female students and 28 male students are enrolled in the UPAD programme.

## **6.2. Concept of the study programme**

### Structure, ECTS and modularization

The four-year Bachelor programme “Urban Planning and Architectural Design” is well structured and has significantly been further developed. It consists of two major disciplines: Urban Planning and Architecture. Both address similar challenges, but operate on different levels. Initially the programme was focused on Urban Planning, with Architecture just as a sub-discipline. As these two disciplines depend heavily on each other, the department saw the need to incorporate additional architecture-based courses into the programme. In the Bachelor programme both disciplines are now taught together with an integrative view.

The three categories design, knowledge and communication are categorised into the following modules and well integrated in the curriculum:

- Design: Design Studios, Thesis
- Knowledge: Architectural and Urban Knowledge, Historical Knowledge, Societal Knowledge, Technical Knowledge
- Communication: Visual Communication, Verbal Communication

The major part of the study programme consists of obligatory modules to provide students with essential skills and knowledge. But students are also offered some electives to expand their knowledge according to their individual interests. In their Bachelor thesis, the students have to specialise either on Architecture or Urban Planning.

The programme offers a balanced mixture of applied sciences and theoretical studies and the programme is clear structured. The design studios focus on the training of a design based approach to problem-solving in urban and architectural fields. The knowledge-oriented subjects support work in the studios by providing essential facts and methods in various fields: historical, tech-

nical, societal, and specifically, architectural and urban issues. The curriculum of the study programme reflects its objectives: to qualify students for the local and regional work environment and its challenges.

In the first year, courses are focused on basic knowledge in Urban Planning and Architecture, and give an introduction to project design. In the second year, students receive courses in building technology at a higher level. Urban design courses run parallel to building technology courses and provide the basis for integrated projects. The third year focuses on the application of specific knowledge. Great emphasis is given to the design work of the integrated projects. In the fourth year, students specialize either in Urban Planning or Architecture. An internship, which has to be completed before the Bachelor thesis, provides the students insights into the practical work as a planner, designer or architect. In the last semester, students write their Bachelor thesis, which is complemented by weekly consultations.

The workload in general is feasible, but it should nevertheless be spread more evenly over the semesters. In semesters 3 and 4, the workload of with 32 and 34 credits respectively is above the usual average workload of 30 credits per semester, whereas in semesters 7 and 8 the workload with 29 and 25 credits respectively is lower. But this seems to be no major concern for the students. In the discussions the students stated that the workload is appropriate. The drop-out rate is very low, until now only six students have left the programme. Most students graduate within eight semesters.

According to the experience of the teaching staff, students need support in self-study. Therefore UPAD encourages and partially supervises self-study in the studios. The peers explicitly appreciate these efforts.

In the initial years of the programme, all UPAD students were sent once to RWTH Aachen as part of the mandatory course 'Excursion'. In 2012, the university stopped these trips because of funding problems; in the future, only selected students will be sent to Germany for short study trips. There is an exchange programme between RWTH Aachen and GUtech that allows up to three students per semester to participate in an exchange programme. The peers recommend to renew this cooperation and to put it on a more solid basis.

#### Admission criteria

For admission to the Bachelor programme the Foundation Programme must have been successfully completed with a GPA of 2.0 or above and with a minimum grade in mathematics of B and in creative design of C. There are currently discussions within GUtech to restructure the Foundation Programme. Considering the educational background of the students it is essential that in the future "Creative Design" courses are also integrated in the Foundation Programme so that the students are provided with the relevant basic skills to ensure a successful admission to the UPAD programme.

### Teaching methods

There are various types of teaching methods and techniques: lectures, exercises, studios, field trips, tutorials, integrated projects, design projects. Design projects and integrated projects are linked to knowledge-based courses, so that theoretical knowledge has to be directly applied to a practical situation in the design studios. Besides lectures and projects, self-studies and portfolios are important didactical elements in the study programmes. With the portfolio students should collect and reflect upon their experiences and accomplishments across their years at university. The peers strongly support all activities in this field.

The architectonical project in the framework of the design process is the backbone of the educational programme. Due to the educational background of the students at the beginning of the programme, students have to be coached thoroughly to be familiarised with common study methods, working independently, self-reflection and critical thinking. The discussions with the smart, self-confident and self-critical students showed that this concept furnishes positive results. Students are able to reflect their situation at the UPAD but also in the educational landscape of the Sultanate of Oman and in an international context.

### Changes to the curriculum

On the basis of an evaluation of the existing curriculum in 2012 the UPAD department made some well documented changes to the study programme which led to a substantial improvement of the curriculum. Since the first accreditation, the curriculum has been shifted more towards architecture (which was a recommendation in the first accreditation) and modules have been renamed and restructured. Small course have been combined into bigger course units and more emphasis has been given to courses in building technology. The courses in "Creative Design" have been upgraded with more contact hours in the Foundation Programme, which resulted in an increase of awareness and interest for the subject. Overall, the programme "Urban Planning and Architectural Design" is designed very well. A positive effect of the reduction of fly-ins has been that more permanent staff has been hired. For the further development of the programme, the peers recommend, beside the offered topics, also to strengthen the competences in the areas of civil engineering, building technology, CAD, traffic, transportation, sociology, ecology, environment, building economy and management.

Within the cultural context of the Sultanate of Oman and the cooperation with RWTH Aachen, the peers came across a very interesting model for a cross cultural education. The peers have been impressed by the openness and the commitment of students and staff.

The deficits in the design of outdoor spaces in the actual urban planning practice worldwide show the importance and the relevance of this study programme at GUtech at the interface of architec-

ture and urban planning. This is both a big challenge as well as a chance for the further development of the university. The feedback of the representatives of national and international companies of Oman has been in general very positive.

### **6.3. Implementation**

#### Resources

At the moment, the UPAD has seven permanent staff members: five associate professors and two lecturers. In addition, four interns, two of which are from Germany and two from GUtech, support the department in organisational tasks and in the consultation of students during integrated projects. Fly-in staff teaches a number of specialised courses, which are organised as two week block courses.

So far there are no technical assistants in the programme to supervise, e.g., the wood workshop or other technical tasks, which would be highly desirable. A large portion of the administrative work is handled by a few members of the resident staff. It has become in general more difficult to attract qualified staff. Lecturers have replaced assistant professors and all staff is mainly occupied with teaching and burdened with an above-average administrative workload. This is a continuing challenge, especially with a growing number of students in the programme. Consultation and supervision during self-study time as well as the supervision of the Bachelor theses are not counted as contact hours. This should be corrected. Supervision task should be factored in the calculation of the teaching load.

In the new, very representative and impressive main building of GUtech on the new Halban campus the corridors and the wonderful courtyard could be used more intensively for the teaching in the UPAD programme. The bigger rooms are not only used for lectures but also for workshops and studios. The facilities are used in an innovative way. Class rooms can be transformed into real studios (including workshop tools, printers, facilities to hang up plans, etc.). The library on the top floor offers an excellent working environment and is well equipped. Concerning the use of IT-tools, the interest of the users should be respected as much as possible. For the study programme special graphic programmes are essential, therefore GUtech should also provide IT-support for these special programmes. It seems that there are some unmet demands at this point. Also some investments should be made in workshop equipment like a work bench and other tools in the studios.

In the future, UPAD plans to start two Master programmes that will require additional staff. Resources for the conception and implementation of the Master programmes should therefore be provided. In this context, the efforts to build up research activities have to be considered as well.

The UPAD department could be more visible in the public, thus the activities of UPAD could be published and disseminated much wider in the internet, in magazines and books.

The peers found a young and very motivated team, that works very efficiently and informally. Concerning the organisation of the study programme, the department has delegated special duties to some staff. There is an academic advisor and internship coordinator, a website coordinator, an academic regulations committee and a board of examiners. The staff of the department meets weekly to discuss important issues and current news. At present, the students are not represented in the committees on the department level. Instead, the head of department and the professors of the department meet irregularly with student groups. The informal tools of participation seem to work very well in the cooperation with the students. All members of the student delegation had an active part in the discussions with the peers. The staff of the UPAD Department is also in contact with external institutions; the professors participate in events as critics or guest lecturers, additionally, the department invites external critics and professionals for lectures and presentations. The peers welcome this exchange and the integration into the curriculum because this gives the students the possibility to get in contact with labour market representatives, thus creating contacts for internships.

In the framework of international cooperation the UPAD Department has an agreement with RWTH Aachen for a bilateral student exchange. In addition, the UPAD department has been active in research and teaching projects on the national and international level. A membership of European Association for Architectural Education (EAAE/AEEA) should be discussed.

The broadening of the scope of the Bachelor programme, the planning and the implementation of two new Master programmes, the increase of research activities and the plans for growing student numbers are demanding additional financial resources, which are only partly available. This implies that the distribution of the financial resources within GUtech has to become more transparent as well. Alternative models to reward the performance of the academic staff should be taken into consideration.

The staff of UPAD is well aware of the challenging steps of the future development of the department/faculty, its opportunities and threats. With limited resources the development plans ask for more commitment and efforts of the employees. After having now completed the initial phase of the programme the next decisive steps have to be planned very carefully. A staff development plan, career plans, perspectives for professors (lengths of contracts) and long-term perspectives of the fly-in-professors should be worked out together with the management of GUtech.

### Examination System

The examination system is well organised and the peers assess the examination system as appropriate. The assessment scheme is transparently described and uses multiple assessment methods to check different competencies of the students. The types of assessment as well as the weighting

and the requirements for passing a course are clearly stated in the respective module descriptions. To meet the different learning outcomes assessment types differ among the modules. UPAD assessment types include: project work and presentation (at the end of the respective module), exercise based exams (during the module), and oral and written examinations (at the end of a module). The exams are spread out evenly over the semester. The exams are module-related and competence-based. Small assessments throughout the semesters give the student a continuous feedback about their performance.

## **7. Computer Science (B.Sc.)**

### **7.1. Objectives of the study programme**

The Bachelor programme “Computer Science” (CS) is a four-year programme with a major in Computer Science and a minor in Information Systems. The stated objectives of the study program are to enable students to “identify, assess and shape information technology ideas into real business opportunities and to support such ventures through entrepreneurial private, government and civil society initiatives. The graduates of the programme will be ready to enrol in postgraduate studies in the field of computer science in any local and international university.”

In 2009, the Computer Science programme was accredited by ACQUIN under the name “Applied Information Technology”. In 2012, GUtech changed the name to “Computer Science”. This name change has led to the current objectives and curriculum as well as its implementation. The peers strongly support this transition, which concludes a discussion begun during the first accreditation. By and large, the programme now has a very coherent structure. The peers are pleased to see that the number of students is growing. Currently there are 32 students enrolled in the Bachelor programme and 45 students in the respective stream in the Foundation Programme.

The programme has a profile typical for computer science teaching, slightly adapted to local needs in the Gulf region. The overall objectives are well documented. GUtech distinguishes between generic skills of graduates in general and subject-related competencies. The description of generic skills is well balanced and suitably summarized. It includes competencies for involvement in society and personality development. A unique characteristic of the university is the emphasis on English and German language and culture. The collection of subject-related competencies focusses on the typical skills expected of a computer scientist.

Employability for the graduates is another general goal. The faculty keeps in close contact with local businesses and with earlier graduates of the programme (by personal communication with the few students who have graduated by now). The graduates started either with a Master programme or work in the industry of Oman and the region.

The target group of the programme consists of high school graduates from Oman and abroad. Students will either have Oman citizenship or come from expatriate families. High school students holding an Omani General Education Diploma typically start by entering the Foundation Programme.

## **7.2. Concept of the study programme**

### Structure, ECTS and modularization

The Bachelor programme “Computer Science” includes the following key areas: Mathematical Foundations (28 credits), Computer Science (149 credits), Business courses (26 credits), German Language and Culture (24 credits), an Internship (9 credits) and a General Elective (4 credits).

Whereas semesters 1 to 4 consist exclusively of obligatory modules, the later semesters allow a moderate choice from elective modules (in total 42 credits). However, because of the tight personnel resources, no parallel electives can be offered, yet the students can be involved in choosing which module will be offered as an elective. The number of electives currently offered in Computer Science should be increased, which would probably require more staff. The mathematical foundations that are taught in the courses are appropriate. In the modules “Mathematics for Computer Science I” and “Mathematics for Computer Science II” Calculus and Linear Algebra is taught, whereas the module “Logic and Discrete Structures” teaches basic mathematical skills such as logical arguments and proofs, with “Probability and Statistics” following in the fourth semester.

The above-mentioned modules are given nondescript titles such as “Mathematics for Computer Science I” and “Mathematics for Computer Science II”, but both their content and as well as their choice of textbooks clearly shows that the subject matter is generally and internationally known by the names “Calculus” and “Linear Algebra”. Moreover, the numeration “I” and “II” suggests a continual succession, which is not only misleading, but will also lead to questions, should the students ever have to submit their transcript, for example to apply to another university’s Master programme. These two modules should therefore be renamed.

Regarding computer science, the first five semesters mainly teach material typical for a CS Bachelor: “Computing Fundamentals”, followed by “Data Structures”, a module each on “Computer Architecture”, “Operating Systems”, “Databases”, “Networks” and “Software Engineering”, complemented by a lab course and a basic course on “Theory of Computing”. This is supplemented by a practical course on “Web Design and Development” and some more challenging courses on “Efficient Algorithms” and “Numerical Computation”. In the last semesters, the curriculum requires the choice of electives, a pro-seminar, a seminar and an internship.

In the business track, aside from an introductory course (3 credits), the required subjects are "Accounting and Controlling" (5 credits) as well as "Decision Theory" (5 credits) and some electives (in total 10 credits) in the later semesters.

The contents of the courses correspond to the expected level of qualification. Though theory oriented courses could focus more on the module objectives in some cases.

The credits allocated to the modules are adequate. According to the plan of study they are evenly distributed between the semesters. The workload is appropriate, most students graduate within the prescribed period of study and so far there have been no drop-outs in the programme.

The course descriptions are informative and complete, with just a few exceptions:

- "Mobile Applications": The course description is generic, essentially it mentions lab work but no particular subjects, and nothing pertaining to the course name, no literature either.
- "Interactive Systems and Computer Graphics": It is unclear, whether this is a theoretical or a practical course. Neither a programming language nor a graphics library nor anything else technical is mentioned. The textbook references suggest that this is not a hands-on course. As presented, the contents do not really map the title part "Computer Graphics"
- Internship: The description of this module contains phrases, not tying well with this kind of course. Among the requirements for obtaining credits, for instance, "adequate participation" (this should be self-understood when working in a company), and "submit assignments on time" (are there periodic assignments during the internship?) are mentioned. Moreover it is unclear what "score at least 50% over the entire semester" relates to.

These module descriptions should be revised.

#### Admission criteria

The prerequisite for entering the Bachelor programme "Computer Science" is the successful completion of the Foundation Programme. In the case of Computer Science, this means that students are familiarized with basic mathematics and programming skills. Required courses in the Foundation Programme are "Academic English", "Mathematics" (advanced), "Creative Design", "Information Technology" and "Economics". The Foundation Programme gives students also the possibility to switch to another Bachelor programme, and indeed, in the case of Computer Science it is reported that up to 50% change their mind and choose a different subject by the end of the foundation phase.

#### Teaching methods

All students in this programme experience a variety of teaching and examination methods. The main teaching forms are lectures, but there are also hands-on courses and labs, seminars, and an internship. These teaching methods are appropriate for the defined learning outcomes.

However, in practice there are also several courses which are typically taught by external professors, the so called "fly-ins", who spend a week or two in Oman in order to teach a course in a week-long "block". It is clear that a week-long course cannot fully replace a course extending over a semester since the teaching/learning load becomes compressed. Moreover, the arrival of a fly-in and the start of the block-course puts all other courses temporary on hold, to be taken up again when the fly-in leaves. This situation is less than satisfactory and it is strongly recommended to minimize the number of fly-ins, especially those teaching core courses, and to schedule the remaining ones for dates when they will not interfere with the regular teaching schedule.

### Changes to the curriculum

Since the last accreditation a number of reasonable changes in the study programme have been made. These are well documented in the self-report. A major change was the renaming of the study programme from "Applied Information Technology" to "Computer Science". Learning outcomes have been adjusted, electives are now more flexible. Also the order of modules was switched, e.g. the module "Probability and Statistics" is now taught in the third semester and "Numerical Computation" in the fourth semester and modules were renamed (e.g. "Technical Computer Science" to "Computer Architecture", "Programming Concepts" to "Programming Fundamentals"). The peers received a very positive impression of the study programme. The subjects and modules are spread evenly and they cover the relevant content and competencies to meet the programme objectives; they prepare the graduates well for their professional tasks

## **7.3. Implementation**

### Resources

The CS department has four professors (one full professor, two associate professors and one assistant professor). The teaching staff is well qualified, covering specific areas of computer science. A few fly-in professors giving block courses assist the faculty. These guest lectureships are mainly relevant for the minor in Information Systems. In the future, the Faculty of Economics should assist in teaching this subject.

There is no additional academic or technical staff. The highly motivated professors install and maintain the software systems necessary for the classes themselves. The self-report contains a detailed planning of the teaching load in the coming years. It shows convincingly that the department will be in need of two additional professors as soon as the full numbers of student cohorts are enrolled.

The financial resources are sufficient to provide the adequate teaching equipment. Unfortunately, there is only a very small budget available for conference visits and expenses which are indispensable for further qualification and promotion of research activities.

Facilities, offices, labs, lecture halls, seminar rooms and the library have been newly built and are adequate for the intended use.

On account of the small number of students and professors in Computer Science, most of the communication happens in an informal way. Official boards and committees exist, but regular meetings are not considered necessary.

#### Examination System

Methods of assessment are written exams, presentations, project work and written reports. The different examination forms are well suited for testing the competences of students. Students' performance is monitored throughout the semester, e.g., in terms of participation, quizzes and assignments so that students obtain a continuous feedback. The examination system is well elaborated and the examination load as well as the examination organisation of the study programme is appropriate.

## **8. Quality Management**

GUtech is developing a holistic quality management system which follows the guidelines of RWTH Aachen and is divided into the following four work packages (WP):

- WP1: Development and implementation of a quality management system, all documents and processes will be available on the Q-Wiki platform
- WP2: Evaluation of teaching and study programmes
- 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 student evaluation was formerly undertaken through the EvaSys program of RWTH Aachen, but has been replaced by GUtech's own system. This system offers a wider range of questionnaires for different course types. Within the separate departments of GUtech the results of the student evaluation are accessible to the heads of the departments. So far, students do not receive an official feedback of the evaluation results, but students are aware that this process will benefit future students. GUtech has implemented several procedures for getting feedback from students. There are also formalized complaints and grievance procedures.

Originally a mentoring system existed in which a personal mentor was appointed for each student. Over time and with growing student numbers this programme has been proved impractical and thus has been replaced by the position of academic advisors. Each department has appointed an academic advisor who is the first person the students contact in case of requests. This position is usually held by one member of the teaching staff, resulting in additional workload for this person.

Students do not hesitate to approach the departmental staff in case of requests. Students are aware that not only the academic advisor but all teaching staff members within the departments can be contacted, and they feel that their needs are heard and taken seriously. The still small number of students at the GUtech enables close ties between the teaching staff and the students, assuring a good flow of information in both directions. With growing student numbers, the position of academic advisors may become even more important and thus more time-consuming. This should be kept in mind in the calculation of the workload.

Due to the relatively small amount of graduates, feedback from graduates is only obtained informally. An alumni network is currently being developed. The qualification of the teaching staff is assured within the recruitment process. It is also planned to introduce staff key performance indicators.

The processes for programme reviews and the implementation of proposed changes are clearly described. At least once every two years the departmental board appoints a curriculum committee

which monitors and reviews the study programmes. The committee's report, including recommendations for changes in the curriculum, is presented to the departmental board for approval. In case of major changes the approval of the academic board and the MoHe is required in addition. Results of the internal quality management procedures have been used for the further development of the study programmes. External Advisory Committees advise the departments in all matters concerning industry and government needs for graduates from the study programmes.

All members of GUtech show a high commitment to the university and its aims, quality is seen as a shared value and a collective responsibility for all members of the institution. In summary, the peer review group concludes that the already established quality assurance measures are adequate. The quality management system is well designed and the internal processes assure the further development of the study programmes.

## **9. Summary**

The Bachelor programmes „Applied Geosciences“ (B.Sc.), “Computer Science” (B.Sc.) and “Urban Planning and Architectural Design” (B.Sc.) at GUtech are consistent and well structured. They offer both a solid foundation for a direct entry into the labour market and the adequate preparation for future Master programmes.

Overall, the peer review group received a very good impression of all study programmes. The objectives of the study programmes are valid and conclusive; the curricula are appropriately designed for the achievement of the given objectives. The organizational and personnel resources are adequately geared toward the targeted goals of the programmes. However, the infrastructural facilities should be improved in the future, e.g., in terms of bigger lecture halls and laboratory facilities. The study programmes meet the relevant German requirements and are in accordance with the German and Omani qualification frameworks.

The peer review group would like to take this opportunity to thank all participants at the GUtech for their open and constructive discussions and the excellent preparation of the on-site visits. The review group had the opportunity to take a comprehensive look at the university and the study programmes, and would like to point out the very strong commitment of the individuals involved in the programmes, which significantly contributes to the success of the study programmes.

## **10. Evaluation according to the „Criteria for the Accreditation of Study Programmes“ (resolution of the Accreditation Council of 08.12.2008, last amended on 20.02.2013)**

### **Criterion 1: Qualification Objectives of the Study Programme Concept:**

- Bachelor programme “Applied Geosciences” (B.Sc.): criterion fulfilled

- Bachelor programme “Computer Science” (B.Sc.): criterion fulfilled
- Bachelor programme “Urban Planning and Architectural Design: criterion fulfilled
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#### **Criterion 2: Conceptual Integration of the Study Programme in the System of Studies**

- Bachelor programme “Applied Geosciences” (B.Sc.): criterion fulfilled
- Bachelor programme “Computer Science” (B.Sc.): criterion fulfilled
- Bachelor programme “Urban Planning and Architectural Design: criterion fulfilled

#### **Criterion 3: Study Programme Concept**

- Bachelor programme “Applied Geosciences” (B.Sc.): criterion fulfilled
- Bachelor programme “Computer Science” (B.Sc.): criterion fulfilled
- Bachelor programme “Urban Planning and Architectural Design: criterion fulfilled

#### **Criterion 4: Academic Feasibility**

- Bachelor programme “Applied Geosciences” (B.Sc.): criterion fulfilled
- Bachelor programme “Computer Science” (B.Sc.): criterion fulfilled
- Bachelor programme “Urban Planning and Architectural Design: criterion fulfilled

#### **Criterion 5: Examination System**

- Bachelor programme “Applied Geosciences” (B.Sc.): criterion fulfilled
- Bachelor programme “Computer Science” (B.Sc.): criterion fulfilled
- Bachelor programme “Urban Planning and Architectural Design: criterion fulfilled

#### **Criterion 6: Programme related Co-operations**

- Bachelor programme “Applied Geosciences” (B.Sc.): criterion fulfilled
- Bachelor programme “Computer Science” (B.Sc.): criterion fulfilled
- Bachelor programme “Urban Planning and Architectural Design: criterion fulfilled

**Criterion 7: Facilities**

- Bachelor programme “Applied Geosciences” (B.Sc.): criterion fulfilled
- Bachelor programme “Computer Science” (B.Sc.): criterion fulfilled
- Bachelor programme “Urban Planning and Architectural Design: criterion fulfilled

**Criterion 8: Transparency and Documentation**

- Bachelor programme “Applied Geosciences” (B.Sc.): criterion fulfilled
- Bachelor programme “Computer Science” (B.Sc.): criterion fulfilled
- Bachelor programme “Urban Planning and Architectural Design: criterion fulfilled

**Criterion 9: Quality Assurance and Further Development**

- Bachelor programme “Applied Geosciences” (B.Sc.): criterion fulfilled
- Bachelor programme “Computer Science” (B.Sc.): criterion fulfilled
- Bachelor programme “Urban Planning and Architectural Design: criterion fulfilled

**Criterion 10: Study Programmes with a Special Profile Demand**

- Not applicable

**Criterion 11: Gender Justice and Equal Opportunities**

- Bachelor programme “Applied Geosciences” (B.Sc.): criterion fulfilled
- Bachelor programme “Computer Science” (B.Sc.): criterion fulfilled
- Bachelor programme “Urban Planning and Architectural Design: criterion fulfilled

**11. Accreditation Recommendation of the Peer Group to the Accreditation Commission of ACQUIN**

The peer group recommend the accreditation of the Bachelor programmes “Applied Geosciences” (B.Sc.), “Urban Planning and Architectural Design” and “Computer Science” (B.Sc.) **without conditions.**

## **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 committees the accreditation commission took on September 29<sup>th</sup>, 2015 the following decisions:

### **Bachelor programme “Applied Geosciences” (B.Sc.)**

**The Bachelor programme “Applied Geosciences” (B.Sc.) is accredited without conditions.**

**The accreditation is valid until September 30<sup>th</sup>, 2021.**

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

- Laboratories should be sufficiently equipped regarding the size, student number capacity and analytical and computer equipment.
- With respect to the changing labour market and the planned admission of 80 students the additional sectors hydrogeology and mineral resource geology should be strengthened in the curriculum (staff and equipment).
- Electives should be integrated into the curriculum, especially new modules in the area of petroleum engineering.
- Fly-in and drive-in professors should be better integrated in the teaching process of the programme and should provide a teaching concept and the content of their lectures.
- The duration of the block courses should be compatible with the students' learning abilities. The workload of the block courses should be evaluated regularly.

### **Bachelor programme “Computer Science” (B.Sc.)**

**The Bachelor programme “Computer Science” (B.Sc.) is accredited without conditions.**

**The accreditation is valid until September 30<sup>th</sup>, 2021.**

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

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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

- Two additional professors should strengthen the staff capacity of the Department of Computer Science.
- The number of permanent staff should be increased so that the number of fly-in professors teaching block courses can be kept as small as possible.

#### **Bachelor programme “Urban Planning and Architectural Desin” (B.Sc.)**

**The Bachelor programme “Urban Planning and Architectural Design” (B.Sc.) is accredited without conditions.**

**The accreditation is valid until September 30th, 2021.**

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

- Competences in the areas of civil engineering, building technology, CAD, traffic transportation, sociology, ecology, environment, building economy and management should be strengthened in the programme.
- Resources for the design and implementation of the Master programme should be provided.
- IT-support for the graphical software programmes should be provided.

The following overall recommendations are given for the GUtech and its study programmes:

- The communication between the central and decentral level should be strengthened such that the study programmes can be carried out properly.
- A plan for human resource development including transparent criteria for the promotion of staff should be developed.
- In view of the increasing number of students sufficiently large lecture halls and lab facilities and equipment should be provided.
- Research activities should be given support by the university as much as possible.
- 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.