

# **Geomatic Undergraduate Programme at the Universiti Teknologi Malaysia – Students and Alumni Perspectives**

**Farah Aishah ALIAS, Malaysia**

**Key words:** Geomatic Programme, Undergraduate, Outcome Based Education, and Best Practice

## **SUMMARY**

Geomatic education at undergraduate level in Malaysia started many decades ago. The pioneer institution in this land surveying and mapping or geomatic discipline is the Universiti Teknologi Malaysia (UTM), and then followed by other institutions at much later stage. UTM has produced many land surveyors since then and they are being employed in various sectors (both in government and private). This paper discusses some aspects of the UTM geomatic undergraduate academic programme's curriculum and syllabus and highlights some reflections of the programme by several alumni and existing students. This 4-year programme has been benchmarked by several institutions within or beyond Malaysian border. Revising and improving the programme to a much better level of acceptance by various stake holders including the industry are being continuously carried out by the institute. The outcome of the interview, survey and questionnaire on the programme provides vital feedback to the programme owner and thus to the university. Engaging or benchmarking the programme at the international arena is also important and could determine the sustainability of the programme both for local and international students and this aspect will form part of the discussion for an improvement to the programme. The remaining of this paper highlights the acceptance level among the existing students and alumni towards the programme. Outcome based education within the programme is also being evaluated and monitored by the programme owner with the aim to provide the best undergraduate geomatic programme in the country. The feedback from the students as well as from new graduates provides vital input to the success of the programme.

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## **1. INTRODUCTION**

In general, many land surveyors graduated from Universiti Teknologi Malaysia (UTM) since several decades ago and UTM still busy with the geomatic programme since then. The geomatic undergraduate programme is one of the academic courses being offered by the Department of Geoinformation. It has been synonymous that when it comes to surveying education in Malaysia, then UTM is the place to look to or to be. This paper attempts to discuss the popularity of the program among current and past students (alumni) of which the outcomes of the questionnaire could be utilized as feedback to the programme owner. The questionnaire has been designed in such way that several aspects related to the programme could be addressed immediately (if possible) or in the near future.

The remaining of the paper discusses the structure of the four-year programme in Section 2, the feedback of the programme in Section 3. Section 4 highlights the concluding remarks.

## **2. THE FOUR-YEAR PROGRAMME**

UTM runs this four-year geomatic engineering programme since more than a decade ago. It has been the backbone undergraduate programme for the Department of Geoinformation of UTM since then. Standard output figure for yearly graduate of this programme is approximately between 50 to 70, and most of these graduates work in various sectors such as government departments, private sectors and also as freelance surveyors. Academically, the programme is based on 133 credit hours with the following categories of courses (80 credits for core courses, 33 credits for elective courses, and 20 credits for university courses). The structure of the programme as illustrated below (Undergraduate Handbook 2013/2014, Faculty of Geoinformation and Real Estate, UTM):

### **Year 1**

#### **Semester I**

SGHU 1012 Introduction to Geomatic  
SGHU 1013 Fundamental of Survey and Mapping  
SGHU 1093 Computer Programming

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SGHU 1412 Computer Aided Design for Surveyors  
SSE 1523 Mathematic for Surveyors  
UICI 1012 Islamic and Asian Civilization  
UHAS 1151 Ethnic Relations

### **Year 1**

#### **Semester II**

SGHU 1043 Engineering Survey  
SGHU 1203 Field Astronomy  
SGHU 1452 Photogrammetry I  
SGHU 1502 Cartography  
SSE 1442 Statistics for Surveyors  
ULAB 1112 English for Academic Communication  
UHAS 2112 Critical and Creative Thinking  
UKQ\* 1\*\*1 Co-Curriculum I

### **Year 2**

#### **Semester I**

SGHU 2043 Engineering Survey Technology  
SGHU 2452 Photogrammetry II  
SGHU 2513 Hydrographic Surveying  
SGHU 2552 Introduction to GIS  
SGHU 2602 Geodesy I  
SGHU 2922 Technical Writing  
UICI 2022 Human, Technology and Science  
or  
UHA 1012 Malay Language Communication (for International students)

### **Year 2**

#### **Semester II**

SGHU 2252 Satellite Positioning  
SGHU 2313 Cadastral Survey  
SGHU 2412 Introduction to Adjustment Computation  
SGHU 2613 Geodesy II  
SGHU 2901 Survey Camp  
SGHU 2\*\*3 Elective I  
ULAB 2112 Advanced English for Academic Communication  
UKQ\* 1\*\*1 Co-Curriculum II

### **Year 3**

#### **Semester I**

SGHU 3\*\*3 Elective 2  
SGHU 3\*\*3 Elective 3

SGHU 3\*\*3 Elective 4  
SGHU 3\*\*4 Elective 5  
SGHU 2403 Introduction to Remote Sensing  
SGHU 4313 Land Law and Survey Regulation

### **Year 3**

#### **Semester II**

SGHU 3903 Industrial Training - Seminar  
SGHU 3909 Industrial Training – Field

### **Year 4**

#### **Semester I**

SGHU 3\*\*3 Elective 6  
SGHU 4\*\*3 Elective 7  
SGHU 4\*\*3 Elective 8  
SGHU 4\*\*3 Elective 9  
SGHU 4332 Land Administration  
SGHU 4942 Undergraduate Project I  
ULAB 3\*\*2 English (Elective)

### **Year 4**

#### **Semester II**

SGHU 4\*\*3 Elective 10  
SGHU 4\*\*3 Elective 11  
SGHU 4342 Professional Practice  
SGHU 4372 Project management for Surveyors  
SGHU 4944 Undergraduate Project II  
UHAS 3012 Entrepreneurship and Enterprise Development

### **Elective courses**

SGHU 2523 Hydrographic Surveying Technology  
SGHU 3253 Global Navigation Satellite System  
SGHU 3283 Least Square Estimation  
SGHU 3553 Land Information System  
SGHU 3723 Falaq Syarie  
SGHU 3743 Physical Oceanography  
SGHU 3763 LIS Database Management  
SGHU 4133 Topographic Mapping using Remoetly Sensed Data  
SGHU 4273 Utility Mapping  
SGHU 4313 Land Law and Survey Regulation  
SGHU 4323 Cadastre Survey Practice

SGHU 4663	Port and Coastal Engineering
SGHU 4823	Tidal Processing and Analysis
SGHU 4833	Digital Imaging Photogrammetry and Application
SGHU 4843	Environmental Studies
SGHU 4853	Development and Implementation of LIS
SGHU 4863	Industrial Survey
SGHU 4873	Law of the Sea
SGHU 4893	Map Projection

The evaluation of the programme is based on OBE (Outcome Based Education). However, in reality, not all courses were on OBE, it is mainly due to obvious reasons e.g. not all lecturers were OBE savvy, and it would take some time to materialize the 100% OBE. However, most of the academic members have been trained towards OBE.

### **3. THE FEEDBACK**

A survey has been conducted among existing students of year 3 and year 4 especially and their views show that the programme provides the right environment for learning the courses. Majority have indicated that they like the programme and only small number of correspondents provide negative views. One aspect of learning process such as the Industrial Training in year 3 (semester II) has been suggested to organize for longer period, e.g. 3 months rather than 2 weeks training currently.

Feedback from ex-students are quite interesting to note – majority of them agree that the programme provides excellent knowledge on the geomatic discipline. A number of alumni work either locally or within international companies, ranging from typical land surveying jobs to hydrographic companies and information system. However, some alumni have suggested for more knowledge on cartography, fundamental mapping courses, e.g. geodesy and photogrammetric mapping. Mathematics for geomatic also needs to be revised and addressed in the next version of the curriculum.

### **4. CONCLUSION**

This paper described the academic structure of the programme and highlighted several points that needs to be addressed as suggestions for improvement. Majority of the correspondents are happy with the programme, however, the groups also suggested several points for improvement.

## **REFERENCES**

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## **BIOGRAPHICAL NOTES**

Farah Aishah Alias, currently a student of Geomatic undergraduate programme at Universiti Teknologi Malaysia.

## **CONTACT**

Farah Aishah ALIAS,  
Department of Geoinformation,  
Faculty of Geoinformation and Real Estate,  
Universiti Teknologi Malaysia,  
81310 UTM Johor Bahru,  
Johor, MALAYSIA

Email: fara.aisha@gmail.com