USM Vision
Transforming Higher Education for a Sustainable Tomorrow

USM Mission
USM is a pioneering, transdisciplinary research intensive university that empowers future talents and enables the bottom billions to transform their socio-economic well-being
**STUDENT'S PERSONAL INFORMATION**

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# ACADEMIC CALENDAR - ACADEMIC SESSION 2016/2017

**FOR ALL SCHOOLS (EXCEPT THE SCHOOL OF MEDICAL SCIENCES AND SCHOOL OF DENTAL SCIENCES)**

*Registration for New Students (28 August 2016) / Orientation Week 29 August - 4 September 2016*

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1. INTRODUCTION

This Engineering handbook is specially prepared for the undergraduate engineering students of Universiti Sains Malaysia who will commence their first year studies in the academic year of 2016/2017. This handbook contains concise information that will prove useful in helping students to understand the university’s system of study as well as to adapt oneself to university life.

Information in this handbook covers various aspects such as the programme structure of the Bachelor of Engineering degree, the academic system, types of courses, synopsis of the courses, student status, examination and evaluation system, information about the engineering schools, reference materials and academic staff list. This information would give a clear picture to the students for them to plan their academic studies, understand the field of studies that they are following and adapt themselves to the teaching and learning environment of the university.

Universiti Sains Malaysia offers Bachelor of Engineering (with Honours) programmes through its six schools of engineering:

- School of Aerospace Engineering
- School of Chemical Engineering
- School of Civil Engineering
- School of Electrical and Electronic Engineering
- School of Materials and Mineral Resources Engineering
- School of Mechanical Engineering

1.1 History and Development

In 1972, Universiti Sains Malaysia established the School of Applied Science at the Main Campus in Penang and offered basic fields of engineering studies. The fields of studies offered at the time were Electronic Technology, Polymer Technology, Food Technology, Materials Technology and Mineral Resources Technology.

In 1984, the School of Applied Science was restructured and given a new name, the School of Engineering Science and Industrial Technology. This restructuring, which corresponded to the development of Malaysia’s Industrial Masterplan that is in turn related to the country’s human utilization needs, gave birth to three new schools. They were the School of Industrial Technology which focused on offering studies in fields such as polymer and food technologies, the School of Electrical and Electronics Engineering and the School of Materials and Mineral Resources Engineering.

The expansion that took place required an increase in the physical space of the campus. Since the physical area of USM in Penang at the time was rather limited, a new area in the state of Perak was identified as the site for the development of a branch campus.

A decision was reached whereby all fields of engineering studies were transferred to Perak while the School of Industrial Technology remained in Penang. In 1986, the School of Electrical and Electronics Engineering and the School of Materials and Mineral Resources
Engineering moved to a temporary campus at the old Ipoh Town Council building while waiting for the construction of the USM branch campus in Bandar Baru Seri Iskandar, Perak Tengah District, Perak to be completed. The temporary campus was named USM Perak Branch Campus (USMKCP – USM Kampus Cawangan Perak).

In 1987, construction began at the site of USM Perak Branch Campus in Bandar Baru Seri Iskandar. On 1st January 1989, the scope of engineering studies was expanded further with the establishment of two new schools of engineering: the School of Civil Engineering and the School of Mechanical Engineering.

By the end of November 1989, all four USM engineering schools began moving to USM Perak Branch Campus in Seri Iskandar in stages and the moving process finally ended in April 1990. The Ipoh Town Council building which housed USM’s temporary campus was handed back to the Town Council in a glorious ceremony that was graced by the DYMM Seri Paduka Baginda Yang Dipertuan Agong, Sultan Azlan Shah.

In 1992, USM established its fifth engineering school, the School of Chemical Engineering. Two years later, efforts to offer studies in the field of Aerospace Engineering went underway. On 17th of May 1998, the USM Aerospace Engineering Unit was established and on the 1st of March 1999 the unit was upgraded to the School of Aerospace Engineering.

In 1997, the government decided to relocate USMKCP back to Penang. The new campus site was located in Seri Ampangan, Nibong Tebal, Seberang Perai Selatan, Penang while USMKCP’s campus site in Seri Iskandar was taken over by the Universiti Teknologi Petronas (UTP).


In 2007, USM was selected as one of the four research universities by the Ministry of Higher Education [MoHE] through a rigorous evaluation process thus elevating its status to the top among more than 100 public and private universities and colleges in Malaysia. In the same year, USM was rated as the only “excellent” (or 5-Star) university in the Academic Reputation Survey conducted by the Malaysian Qualification Agency (MQA).

On 4th of September 2008, USM was granted with an APEX (the Accelerated Programme for Excellence) status by the Malaysian’s government. USM's transformation plan, entitled “Transforming Higher Education for a Sustainable Tomorrow” will embark on numerous transformational journeys, including revamping most of its activities pertaining to nurturing and learning, research and innovation, services, students and alumni and the management of the university as a whole.

The University takes steps to improve the three core pillars of its strengths, [i] concentration of talent, [ii] resources and [iii] acculturation of supportive governance.
1.2 Philosophy and Objective

The philosophy and objective of the Bachelor of Engineering programme at the Universiti Sains Malaysia is to produce qualified engineering graduates in various fields who are able to find solutions to diverse problems through innovative thinking.

The engineering programme at USM aims to produce professional engineers who are responsible towards research and development, project management, production planning and control and accreditation of equipments in various fields in the country.

Thus all courses that are being offered in the engineering programme blend together the theoretical and practical aspects of learning according to the relevant needs of the industrial and public sectors. The fields of engineering studies in USM are up to date and challenging so as to fulfil the nation’s industrial development needs. Students will also be equipped with fundamentals of business practice such as finance, marketing and management as well as co-curricular activities so that the students could adapt themselves well to the current state of affairs.

1.3 Outcome Based Education

All Bachelor of Engineering Programmes at the Universiti Sains Malaysia have adopted the Outcome Based Education (OBE) since the academic year of 2006/2007. The OBE emphasizes that the professional attributes of the graduates satisfy the current and future needs of the country and global market in general. For this, the programme educational objectives of each programme offered at the Engineering Schools are developed through interviews and surveys from the stakeholders including industries, government, parents, students, alumni and the university lecturers. This signifies that the programmes offered in USM are relevance to the current need of industries and society and for the preparation of high quality future talents.

With the agreed programme educational objectives, the curricular structure of each programme is planned accordingly to ensure that our graduates possess the latest quality attributes as suggested by the Engineering Accreditation Council (EAC) and Board of Engineers Malaysia (BEM) are achieved. The attributes are:

(1) **Engineering Knowledge** - Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to the solution of complex engineering problems;

(2) **Problem Analysis** - Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences;

(3) **Design/Development of Solutions** - Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations;

(4) **Investigation** - Conduct investigation into complex problems using research based knowledge and research methods including design of experiments,
analysis and interpretation of data, and synthesis of information to provide valid conclusions;

(5) **Modern Tool Usage** - Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex engineering activities, with an understanding of the limitations;

(6) **The Engineer and Society** - Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice;

(7) **Environment and Sustainability** - Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development;

(8) **Ethics** - Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice;

(9) **Communication** - Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;

(10) **Individual and Team Work** - Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings;

(11) **Life Long Learning** - Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

(12) **Project Management and Finance** - Demonstrate knowledge and understanding of engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

1.4 Continuous Quality Improvement System

To realize the Outcome Based Education, a few mechanisms have been identified to be incorporated into the continuous quality improvement system for the Bachelor of Engineering programmes. Feedbacks are obtained from industries through the Industrial Advisory Panels which consist of at least five engineers or managers from industrial sectors.

Feedbacks from the students are obtained from the Lecturer-Student Committee and Interview Session with each student before their convocation. Feedbacks from the alumni are obtained from the USM Alumni Relations Unit and the School’s alumni communities through several means such as email, webpage and Facebook. All these feedbacks are incorporated for deliberations and approval by the Curriculum Review Committee which convenes regularly to identify any particular course or programme that need to be revamped or to undergo minor/major changes.
1.5 **External Examiner**

Universiti Sains Malaysia appoints external examiners to serve several or all of the followings:

- Advise the School/Centre concerned regarding matters pertaining to the structure and contents of its undergraduate programmes, research and administration related to examinations. Attention is also focused towards post-graduate programmes where applicable.

- Scrutinise and evaluate all draft question papers prepared by Internal Examiners.

- Visit the university during the period of the examinations in order to be familiar with the work of the School/Centre, the available physical facilities and also to participate in activities related directly to the conduct of the examinations.

- Scrutinise and evaluate answer scripts as may be required by the Dean/Director of the School/Centre concerned and to ensure that the standards set by Internal Examiners (of the discipline to which he/she is appointed) are the same as those at other Universities of International standing.

- Ensure uniformity in the evaluation of answer scripts by the Internal Examiners between candidates of the same standard.

- Examine the oral component or viva-voce where required.

- Hold seminars/meetings with the academic staffs/students if required.

1.6 **Industrial Advisory Board**

The engineering schools offered have set up an Industrial Advisory Board for all offered engineering programmes and various meetings are conducted from time to time. Each school has appointed prominent members from the industry and relevant institutions to be in the Advisory Board. The Industrial Advisory Board members will discuss and give their input on the Industrial Training, Outcome Based Education (OBE) implementation, curriculum development, the requirement of soft skills and other relevant issues to the School to improve the quality of programmes and graduates.

1.7 **Division of Industry and Community Network**

To foster closer, effective, meaningful and sustainable linkages and partnership with the industry and the community, i.e. the world outside Universiti Sains Malaysia, a new division, the Division of Industry & Community Network was established within the Chancellery in September 2007. This new division is headed by a Deputy Vice Chancellor (Industry and Community Network). The function of this division is to match between the knowledge/expertise, facilities and resources of the university to the needs, aspirations and expectations of the industry and the community to result in a win-win situation. This aspiration is also translated to the activities at school levels.
1.8 Stakeholder

In line with the Engineering Accreditation Council (EAC) requirements for involvement of stakeholders in establishing the programme educational objectives, their inputs have been continuously gathered from surveys and direct communications. The University has identified the stakeholders as follows:

- Academic Staff (University)
- Employers (industry and government)
- Alumni
- Student
- Parents of students

1.9 Teaching Delivery Method

Other contributing components to the curriculum such as a variety of teaching and learning (delivery) modes, assessment and evaluation methods are designed, planned and incorporated within the curriculum to enable students to effectively develop the range of intellectual and practical skills, as well as positive attitudes. The assessments to evaluate the degree of the achievement of the Programme Outcomes by the students are done both at the programme as well as at course levels. The teaching and learning methods designed shall enable students to take full responsibility for their own learning and prepare themselves for lifelong learning and knowledge acquisition.
1.10 Course Code

Each course offered by the respective School is denoted by the following code of ABC 123/4. The alphabets and numbers represent:

- A = Aerospace Engineering/General Civil Eng. and Laboratory
- B = Materials Engineering
- C = Chemical Engineering
- D = Designs
- E = Electronics
- G = Geotechnical Engineering (Civil)
- P = Environmental/Mechanical Engineering (Manufacturing)
- H = Hydraulics and Hydrological Engineering
- K = Geomatics Engineering
- M, H = Mechanical Engineering
- L = Highway and Traffic Engineering/Laboratory
- M = Mechatronic Engineering/Mathematics
- P = Polymer Engineering/Water Supply and Environmental Engineering
- S = Mineral Resources Engineering/Structural Engineering (Civil)
- T = Power Electric
- U = General
- X = Independent Studies

School
- A = School of Civil Engineering
- B = School of Material & Minerals Resources Engineering
- E = School of Electrical & Electronics Engineering
- K = School of Chemical Engineering
- M = School of Mechanical Engineering (Mechanical Programme)
- P = School of Mechanical Engineering (Manufacturing Programme)

E=Engineering
### 1.11 Programme Structure

The Structure of the Engineering Degree Programme is as follows:

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<th>Units</th>
<th>Remarks</th>
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<td>(ii) ELECTIVE</td>
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<td>Students may select these courses from the list as determined by the respective school.</td>
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<td>(iii) UNIVERSITY REQUIREMENTS</td>
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<td>(b) English Language</td>
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<td>(c) Islamic and Asian Civilisations</td>
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<td>(d) Ethnic Relations</td>
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<td>(e) Entrepreneurship</td>
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<td>Optional Course (3 Units)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Co-curriculum/Optional/</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Skills</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

```
TOTAL: 135
```

Note:

For graduation, students are required to complete at least 135 units, with ‘pass’ grade for all the courses.
1.12 Courses Offering

Students are required to register for the undergraduate courses in two semesters for each academic session that is Semester 1 and Semester 2. Courses are offered and examined in the same semester. Courses offered are categorized into four levels, via levels 100, 200, 300 and 400, suitable to the requirements of a four-year study programme.

Core Courses

Core course is a compulsory course package which aims at giving a deeper understanding of an area of specialization/major. Students need to accumulate 108 units of the core courses which have been identified by each school.

Elective Courses

Students need to accumulate no less than 12 units from the list of courses suggested and acknowledged by the school.

Optional Courses

Optional courses are courses chosen by the students from among those that are outside of their programmes of study.

The main objective of an optional course is as a substitute course for students who do not take Co-curriculum courses or Skill/Analysis courses.

Audit Courses

In principle, the university allows students to register for any courses on an audit basis for the purpose of enhancing the students’ knowledge in specific fields during the duration of their study. However, the units of any such audit courses will not be taken into consideration for graduation purposes.

The registration procedures for courses on an audit basis are as follows:-

(a) Students can register for courses on an audit basis for the purpose of augmenting his/her knowledge in specific fields. Registration for the said course must be within the course registration week.

(b) Only students of active status are allowed to register for courses on an audit basis.

(c) Courses registered for on an audit basis are designated as code ‘Y’ courses. This designation will be indicated on the relevant academic transcript. A space at the bottom of the academic transcript will be reserved for listing the courses registered for on an audit basis.

(d) Courses registered for on an audit basis will not be taken into consideration in determining the minimum and maximum units of courses that have been registered.
Students must fulfil all course requirements. Students who register for courses on an audit basis, are not obligated to sit for any examinations pertaining to that course. A grade ‘R’ will be awarded irrespective as to whether the student had or had not sat for the examination.

**Laboratory Work/Practical, Engineering Practice and Industrial Training**

Programmes in the School of Engineering place a great emphasis on laboratory work/practical. Laboratory work/practical is an important and essential aspect in most courses. There are also courses that the assessment is based on 100% laboratory /practical marks. It aims to provide students with a better understanding of the subject matter delivered through lectures.

Students are required to submit laboratory/practical reports which are part of the course work assessment for courses delivered through lectures and the laboratory/practical component only. Attendance is compulsory for all levels of study and students may be barred from taking the written examination if their attendance is unsatisfactory.

Apart from attending classes (lectures and laboratory/practical), students must also undergo the Engineering Practice Course and Industrial Training.

The Engineering Practice Course is a course on civil engineering practices. The course includes introduction to civil engineering practices, understanding civil engineering and constructions drawings, contract documents, health and safety in civil engineering and project management. Site visits to construction sites are organized. A team building and leadership camp is also conducted to instil team works and leadership skills.

Industrial Training is conducted over 10 weeks during the long break after Semester II at level 300. Students are exposed to the actual operations of industries, locally and abroad. It is hoped that students will be able to learn and experience useful knowledge and skills. It is hoped that the training will provide students with a good foundation in engineering. This is a 5-unit course and students will be awarded a Pass/Fail grade upon completion.

**1.13 Graduation Requirements**

Students must fulfil the following requirements to graduate;

(a) Fulfil the minimum residential requirements during the course of studies.
(b) Fulfil all the credit requirements of the course and required units for each component (Core, Elective, Option and University Courses)
(c) Obtain a CGPA of 2.00 and above for Core components.
(d) Obtain a CGPA of 2.00 and above for the programmes.
(e) Achieve a minimum grade C or a grade point of 2.00 for Bahasa Malaysia, English Language, Islamic and Asian Civilisations and Ethnic Relations courses.
(f) Obtain a minimum grade C or a grade point of 2.00 for all engineering courses.
2.0 ACADEMIC SYSTEM AND GENERAL INFORMATION

2.1 Course Registration

Registration of courses is an important activity during the period of study at the university. It is the first step for the students to sit for the examination at the end of each semester. Signing up for the right courses each semester will help to facilitate the graduation of each student from the first semester till the final semester.

2.1.1 Course Registration Secretariat for the Bachelor Degree and University’s Diploma Students

Student Data and Records Section (SDRP)  
Academic Management Division  
Registry  
(Level 1, Chancellory Building)

Tel. No. : 04-653 2925/3169/4194  
Fax No. : 04-657 4641  
E-Mail : sdrp@usm.my  
Website : http://registry.usm.my/updr

The SDRP office is the Secretariat/Manager/Coordinator of course registration for the Bachelor Degree and Diploma Programme of the University.

Further inquiries regarding course registration activities for the first degree and diploma can be made at any time at the office of the SDRP. Please refer to the contact number above.

2.1.2 Course Registration Platform

(i) *E-Daftar* (E-Registration)

*E-Daftar* is a platform for on-line course registration. The registration is done directly through the Campus Online portal ([https://campusonline.usm.my](https://campusonline.usm.my)). Only students whose academic status is active are allowed to register for courses in the *E-Daftar*.

Registration under *E-Daftar* for Semester 1 usually starts 1-2 days after the release of 'Official' examination results of Semester 2 of the previous academic year. The system closes a day before Semester 1 begins (in September). *E-Daftar* registration for Semester 2 usually starts 1-2 days after the Semester 1 ‘Provisional’ examination results are released until a day before Semester 2 begins (in February). The actual timing of registration under *E-Daftar* will be announced by the Student Data and Records Section usually during the Revision Week of every semester and
will be displayed on the respective Schools/ Centres/ Hostels’ bulletin boards and in the USM’s official website.

Under *E-Daftar*, students can register for any courses offered by USM, except co-curriculum courses. Registration of co-curriculum courses is still placed under the administration of the Director of the Centre for Co-Curriculum Programme at the Main Campus or the Coordinator of the Co-Curriculum Programme at the Engineering Campus and the Coordinator of the Co-Curriculum Programme at the Health Campus.

Co-Curriculum courses will be included in the students’ course registration account prior to the *E-Daftar* activity, if their pre-registration application is successful.

**(ii) Access to *E-Daftar* System**

a. *E-Daftar* System can be accessed through the Campus Online portal (https://campusonline.usm.my).

b. Students need to register in this portal to be a member. Each member will be given an ID and password.

c. Students need to use the ID and password to access their profile page, which includes the *E-Daftar* menu.

d. Students need to click on the *E-Daftar* menu to access and register for the relevant courses.

e. Students are advised to print the course registration confirmation slip upon completion of the registration process or after updating the course registration list (add/ drop) within the *E-Daftar* period.

f. The *E-Daftar* system can only be accessed for a certain period of time.

g. Guidelines to register/gain access to the *E-Daftar* portal are available at the Campus Online portal’s main page.

**(iii) Online Course Registration (OCR) in Schools/Centres**

OCR activities are conducted in the Schools/Centres and are applicable to students who are academically active and under Probation (P1/P2) status. Students who face difficulties registering their courses during the *E-Daftar* period can register their courses during the official period of OCR alternatively. Each school is responsible for scheduling this activity. Students must refer to the schedule at the notice board of their respective Schools.

The official period for OCR normally starts on the first day of the semester (without the penalty charge of RM50.00). After this official date, the registration will be considered late (a penalty of
RM50.00 will be imposed if no reasonable excuse is given). During the non-penalty period, OCR will be conducted at each School. After Week Six, all registration, including adding and dropping of courses will be administered by the Examination and Graduation Section Office (Academic Management Division, Registry).

2.1.3 The Frequency of Course Registration in One Academic Session

(i) **Normal Study Semester**
   - 2 times per year (beginning of Semester 1 & Semester 2)

(ii) **Long semester break** (about one month after the final examination of Semester 2)
   - Once per year
   - Applicable for relevant students only.

2.1.4 General Guidelines before Students Register for Courses

(i) Matters/Information/Documents required to be noted/considered/referred to by students before course registration:
   - Refer to the respective School’s website to get updated information for courses offered or course registration.
   - Decide on courses to be registered according to the semester as stipulated in the Study Programme Guide Book.
   - List courses to be registered and number of units (unit value) for each course.
   - Provide Cumulative Statement of Grades (Cangred).
   - Construct Teaching and Learning Timetable for the registered courses (to avoid overlapping in timetable).
   - Read and comprehend the reminders regarding policies/general requirements for the course registration.

(ii) The number of maximum and minimum units that can be registered in every semester is stated below:

<table>
<thead>
<tr>
<th>Academic Status</th>
<th>Minimum Units</th>
<th>Maximum Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>9</td>
<td>21</td>
</tr>
<tr>
<td>P1</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>P2</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

Determination of academic status in a semester is based on the students’ academic performance in the previous semester (Grade Point Average, GPA):

* GPA 2.00 & above = Active Academic Status
* GPA 1.99 & below = Probation Academic Status (P1/P2)
- Students who meet the minimum period of residency (6 semesters for a 3 year programme, 7 semesters for a 3.5 year programme or 8 semesters for a 4 year programme) are allowed to register courses with a total of less than 9 units. The semester in which the student is on leave is not considered for the residency period.

(iii) Type of course codes during registration:

- **T** = Core courses
- **E** = Elective courses
- **M** = Minor courses
- **U** = University courses

Grade and number of units obtained from these courses are considered for graduation.

Two (2) other course codes are:
- **Y** = audit courses
- **Z** = prerequisite courses

Grade and number of units obtained from these courses are not considered for graduation.

(iv) Advice and approval of the Academic Advisor

- Approval from the Academic Advisor is required for students under Probation status before they are allowed to register during the OCR period. **Probation students cannot access E-Daftar for registration.**
- Approval from the Academic Advisor is not required for students under Active Status to register courses through E-Daftar.

(v) Students are not allowed to register and repeat any course for which they have achieved a grade 'C' and above.

2.1.5 Information/Document Given To All Students through Campus Online Portal (https://campusonline.usm.my)

(i) The information of Academic Advisor.

(ii) Academic information such as academic status, GPA value, CGPA value and year of study.

(iii) Cangred and Course Registration Form.

(iv) List of courses offered by all Schools/Centres.

(v) Teaching and Learning Timetable for all Schools/Centres/Units from the three campuses.

(vi) List of pre-registered courses which have been added into the students’ course registration record (if any).

(vii) Reminders about the University course registration policies/general requisites.
2.1.6 Registration of Language and Co-Curriculum Courses

(a) Registration of Language courses through *E-Daftar* is allowed.

- However, if any problem arises, registration for language courses can still be carried out/updated during the official period of OCR at the office of the School of Languages, Literacies and Translation.

- All approval/registration/dropping/adding of language courses is under the responsibility and administration of the School of Languages, Literacies and Translation.

- Any problems related to the registration of language courses can be referred to the School of Languages, Literacies and Translation. The contact details are as follows:

<table>
<thead>
<tr>
<th>General Office</th>
<th>Malay Language Programme Chairperson</th>
<th>English Language Programme Chairperson</th>
<th>Foreign Language Programme Chairperson</th>
</tr>
</thead>
<tbody>
<tr>
<td>: 04-653 5242/ 5243/ 5248</td>
<td>: 04-6533974</td>
<td>: 04-6533406</td>
<td>: 04-6533396</td>
</tr>
</tbody>
</table>

(b) Registration for **co-curricular courses through E-Daftar** is not allowed.

- Registration for co-curricular courses is either done through pre-registration before the semester begins or during the first/second week of the semester. Co-curricular courses will be included in the students’ course registration account prior to the *E-Daftar* activity, if their pre-registration application is successful.

- All approval/registration/dropping/adding of co-curricular courses is under the responsibility and administration of:

  Director of the Centre for Co-Curricular Programme, Main Campus (04-653 5242/5243/5248)

  Coordinator of the Centre for Co-Curricular Programme, Engineering Campus (04-599 5097/6385)

  Coordinator of the Centre for Co-Curricular Programme, Health Campus (09-767 7547)
(c) **Dropping of Language and Co-Curriculum courses, if necessary, must be made within the first week.** After the first week, a fine of RM50.00 will be imposed.

### 2.1.7 Registration of ‘Audit’ Courses (Y code)

Registration for the ‘Audit’ course (Y code) is **not allowed in the E-Daftar.** It can only be done during the official period of OCR in the School or Centre involved. Students who are interested must complete the course registration form which can be printed from the Campus Online Portal or obtained directly from the School. Approval from the lecturers of the courses to be audited and the Dean/Deputy Dean (Academic) (signed and stamped) in the course registration form is required.

Registration of ‘Audit’ courses (Y code) is **not included in the calculation of the total registered workload units.** Grades obtained from ‘Audit’ course are not considered in the calculation of CGPA and total units for graduation.

### 2.1.8 Registration of Prerequisite Courses (Z code)

Registration of Prerequisite courses (Z code) is **included in the total registered workload (units).** Grades obtained from the Prerequisite courses are not considered in the calculation of CGPA and units for graduation.

### 2.1.9 Late Course Registration/Late Course Addition

Late course registration or addition is not allowed after the official period of the OCR ends unless with valid reasons. General information on this matter is as follows:

i) **Late course registration and addition are only allowed in the first to the third week** with the approval of the Dean. Students will be fined RM50.00 if the reasons given are not acceptable.

ii) Application to add a course **after the third week** will not be considered, except for special cases approved by the University.

### 2.1.10 Dropping of Courses

Dropping of courses is allowed until the **end of the sixth week.**

For this purpose, students must meet the requirements set by the University as follows:

i) **Dropping Course Form** must be completed by the student and signed by the lecturer of the course involved and the Dean/Deputy Dean of their respective Schools and submitted to the general office
of the School/Centre which is responsible for offering the courses involved.

(ii) Students who wish to drop a language course must obtain the signature and stamp of the Dean of the School of Languages, Literacies and Translation, as well as the signature and stamp of the Dean of their respective schools.

(iii) Students who wish to drop the Co-Curriculum courses must obtain the approval of the Centre for Co-Curriculum Programme and the signature and stamp of the Dean of their respective schools.

(iv) The option for dropping courses cannot be misused. Lecturers have the right not to certify the course that the student wishes to drop if the student is not serious, such as poor attendance record at lectures, tutorials and practical, as well as poor performance in coursework. The student will be barred from sitting for the examination and will be given grade 'X' and is not allowed to repeat the course during the Courses during the Long Vacation (KSCP) period.

2.1.11 Course Registration Confirmation Slip

The course registration confirmation slip that has been printed/obtained after registering the course should be checked carefully to ensure there are no errors, especially the code type of the registered courses. Any data errors for course registration must be corrected immediately whether during the period of E-Daftar (for students with active status only) or during the period of OCR at the Schools.

2.1.12 Revising and Updating Data/Information/Students’ Personal and Academic Records

Personal and academic information for each student can be checked through the Campus Online portal (https://campusonline.usm.my). Students are advised to always check all the information displayed on this website.

- The office of the Student Data and Records Section must be notified of any application/notification for correction/updating of personal data such as the spelling of names (names must be spelled as shown on the Identification Card), Identification Card number and address (permanent address and correspondence address).

- The office of the Student Data and Records Section must be notified of any application/notification for correction of academic data such as information on Major, Minor, MUET result and the course code.
- The office of the Examination and Graduation Section must be notified of any application/notification for correction of the examination/results data.

2.1.13 Academic Advisor

Each School will appoint an Academic Advisor for each student. Academic Advisors comprise academic staff (lecturers) of the school. Normally, the appointment of Academic Advisors will be made known to every student during the first semester in the first year of their studies.

Academic Advisors will advise their students under their responsibility on academic-related matters. **Important advice for the students includes the registration planning for certain courses in each semester during the study period.** Before registering the course, students are advised to consult and discuss with their Academic Advisors to determine the courses to be registered in a semester.

**Final year students are advised to consult their Academic Advisors before registering via E-Daftar to ensure they fulfil the graduation requirements.**

Students under Probation status (P1/P2) should obtain approval from the Academic Advisors before they register for courses in a semester through OCR at the School and they are not allowed to register through E-Daftar.

2.2 Interpretation of Unit/Credit/Course

2.2.1 Unit

Each course is given a value, which is called a **UNIT**. The unit is determined by the scope of its syllabus and the workload for the students. In general, a unit is defined as follows:

<table>
<thead>
<tr>
<th>Type of Course</th>
<th>Definition of Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory</td>
<td>1 unit is equivalent to 1 contact hour per week for 13 – 14 weeks in one semester</td>
</tr>
<tr>
<td>Practical/Laboratory/Language Proficiency</td>
<td>1 unit is equivalent to 1.5 contact hours per week for 13 – 14 hours in one semester</td>
</tr>
<tr>
<td>Industrial Training/Teaching Practice</td>
<td>1 unit is equivalent to 2 weeks of training</td>
</tr>
</tbody>
</table>
Based on the requirements of Malaysian Qualifications Framework (MQF):

One unit is equivalent to 40 hours of student learning time

\[1 \text{ unit} = 40 \text{ hours of Student Learning Time (SLT)}\]

2.2.2 Accumulated Credit Unit

Units registered and passed are known as credits. To graduate, students must accumulate the total number of credits stipulated for the programme concerned.

2.3 Examination System

Examinations are held at the end of every semester. Students have to sit for the examination of the courses they have registered for. Students are required to settle all due fees and fulfil the standing requirements for lectures/tutorials/practical and other requirements before being allowed to sit for the examination of the courses they have registered for. Course evaluation will be based on the two components of coursework and final examinations. Coursework evaluation includes tests, essays, projects, assignments and participation in tutorials.

2.3.1 Duration of Examination

<table>
<thead>
<tr>
<th>Evaluated Courses</th>
<th>Examination Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 units</td>
<td>1 hour for coursework of more than 40%</td>
</tr>
<tr>
<td>2 units</td>
<td>2 hours for coursework of 40% and below</td>
</tr>
<tr>
<td>3 units or more</td>
<td>2 hours for coursework of more than 40%</td>
</tr>
<tr>
<td>3 units or more</td>
<td>3 hours for coursework of 40% and below</td>
</tr>
</tbody>
</table>

2.3.2 Barring from Examination

Students will be barred from sitting for the final examination if they do not fulfil the course requirements, such as absence from lectures and tutorials of at least 70%, and have not completed/fulfilled the required components of coursework. Students will also be barred from sitting for the final examination if they have not settled the academic fees. A grade 'X' would be awarded for a course for which a student is barred. Students will not be allowed to repeat the course during the Courses during the Long Vacation (KSCP) period.
2.3.3 Grade Point Average System

Students’ academic achievement for registered courses will be graded as follows:

<table>
<thead>
<tr>
<th>Alphabetic Grade</th>
<th>A</th>
<th>A-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
<th>C</th>
<th>C-</th>
<th>D+</th>
<th>D</th>
<th>D-</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade Points</td>
<td>4.00</td>
<td>3.67</td>
<td>3.33</td>
<td>3.00</td>
<td>2.67</td>
<td>2.33</td>
<td>2.00</td>
<td>1.67</td>
<td>1.33</td>
<td>1.00</td>
<td>0.67</td>
<td>0</td>
</tr>
</tbody>
</table>

Students awarded with a grade 'C-' and below for a particular course would be given a chance to improve their grades by repeating the course during the KSCP (see below) or normal semester. Students awarded with a grade 'C' and above for a particular course will not be allowed to repeat the course whether during KSCP or normal semester.

The achievement of students in any semester is based on Grade Point Average (GPA) achieved from all the registered courses in a particular semester. GPA is the indicator to determine the academic performance of students in any semester.

CGPA is the Cumulative Grade Point Average accumulated by a student from one semester to another during the years of study.

The formula to compute GPA and CGPA is as follows:

\[
\text{Grade Point Average} = \frac{\sum_{i=1}^{n} U_i M_i}{\sum_{i=1}^{n} U_i}
\]

where:

- \(n\) = Number of courses taken
- \(U_i\) = Course units for course \(i\)
- \(M_i\) = Grade point for course \(i\)
Example of calculation for GPA and CGPA:

<table>
<thead>
<tr>
<th>Course</th>
<th>Unit</th>
<th>Grade Point (GP)</th>
<th>Grade (G)</th>
<th>Total GP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABC XX1</td>
<td>4</td>
<td>3.00</td>
<td>B</td>
<td>12.00</td>
</tr>
<tr>
<td>ABC XX2</td>
<td>4</td>
<td>2.33</td>
<td>C+</td>
<td>9.32</td>
</tr>
<tr>
<td>BCD XX3</td>
<td>3</td>
<td>1.67</td>
<td>C-</td>
<td>5.01</td>
</tr>
<tr>
<td>CDE XX4</td>
<td>4</td>
<td>2.00</td>
<td>C</td>
<td>8.00</td>
</tr>
<tr>
<td>EFG XX5</td>
<td>3</td>
<td>1.33</td>
<td>D+</td>
<td>3.99</td>
</tr>
<tr>
<td>EFG XX6</td>
<td>2</td>
<td>2.67</td>
<td>B-</td>
<td>5.34</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>43.66</td>
</tr>
</tbody>
</table>

GPA = \frac{43.66}{20} = 2.18

<table>
<thead>
<tr>
<th>Course</th>
<th>Unit</th>
<th>Grade Point (GP)</th>
<th>Grade (G)</th>
<th>Total GP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABC XX7</td>
<td>3</td>
<td>1.00</td>
<td>D</td>
<td>3.00</td>
</tr>
<tr>
<td>ABB XX8</td>
<td>4</td>
<td>2.33</td>
<td>C+</td>
<td>9.32</td>
</tr>
<tr>
<td>BBC XX9</td>
<td>4</td>
<td>2.00</td>
<td>C</td>
<td>8.00</td>
</tr>
<tr>
<td>BCB X10</td>
<td>4</td>
<td>2.67</td>
<td>B-</td>
<td>10.68</td>
</tr>
<tr>
<td>XYZ XX1</td>
<td>3</td>
<td>3.33</td>
<td>B+</td>
<td>9.99</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40.99</td>
</tr>
</tbody>
</table>

GPA = \frac{40.99}{18} = 2.28

CGPA = \frac{\text{Total Accumulated GP}}{\text{Total Accumulated Unit}} = \frac{43.66 + 40.99}{20 + 18} = \frac{84.65}{38} = 2.23

From the above examples, the CGPA is calculated as the total grade point accumulated for all the registered courses and divided by the total number of the registered units.

2.3.4 Courses During the Long Vacation (Kursus Semasa Cuti Panjang) (KSCP)

KSCP is offered to students who have taken a course earlier and obtained a grade of 'C-', 'D+', 'D', 'D-', 'F' and 'DK' only. Students who have obtained a grade 'X' or 'F*' are not allowed to take the course during KSCP.

The purpose of KSCP is to:

(i) Give an opportunity to students who are facing time constraints for graduation.
(ii) Assist students who need to accumulate a few more credits for graduation.
(iii) Assist "probationary" students to enhance their academic status.
(iv) Assist students who need to repeat a prerequisite course, which is not offered in the following semester.

However, this opportunity is only given to students who are taking courses that they have attempted before and achieved a grade as stipulated above, provided that the course is being offered. Priority is given to final year students. Usually, formal lectures are not held, and teaching is via tutorials.

The duration of KSCP is 3 weeks, i.e. 2 weeks of tutorial and 1 week of examination, all held during the long vacation. The KSCP schedule is available in the University's Academic Calendar.

The Implementation of KSCP

(i) Students are allowed to register for a maximum of 3 courses and the total number of units registered must not exceed 10.

(ii) Marks/grades for coursework are taken from the highest marks/the best grades obtained in a particular course in the normal semester before KSCP. The final overall grade is determined as follows:

\[
\text{Final Grade} = \text{The best coursework marks or grade} + \text{Marks or grade for KSCP examination}
\]

(iii) GPA calculation involves the LATEST grades (obtained in KSCP) and also involves courses taken in the second semester and those repeated in KSCP. If the GPA during KSCP as calculated above is 2.00 or better, the academic status will be active, even though the academic status for the second semester was probation status. However, if the GPA for KSCP (as calculated above) is 1.99 or below, the academic status will remain as probation status for the second semester.

(iv) Graduating students (those who have fulfilled the graduation requirements) in the second semester are not allowed to register for KSCP.

2.3.5 Academic Status

**Active Status**: Any student who achieves a GPA of 2.00 and above for any examination in a semester will be recognised as ACTIVE and be allowed to pursue his/her studies for the following semester.

**Probation Status**: A probation status is given to any student who achieves a GPA of 1.99 and below. A student who is under probation status for three consecutive semesters (P1, P2, FO) will not be allowed to pursue his/her studies at the university. On the other hand, if the CGPA is 2.00
and above, the student concerned will be allowed to pursue his/her studies and will remain at P2 status.

2.3.6 Termination of Candidature

Without any prejudice to the above regulations, the University Examination Council has the absolute right to terminate any student’s studies if his/her academic achievement does not satisfy and fulfil the accumulated minimum credits.

The University Examination Council has the right to terminate any student’s studies due to certain reasons (a student who has not registered for the courses, has not attended the examination without valid reasons), as well as medical reasons can be disqualified from pursuing his/her studies.

2.3.7 Examination Results

A provisional result (pass/fail) through the Campus Online portal (campusonline.usm.my) and short message service (SMS) will usually be released and announced after the School Examination Council meeting and approximately one month after the final examination.

Enquiries regarding full results (grade) can be made through the Campus Online portal and short message service (SMS). The results will be released and announced after the University Examination Council meeting and is usually two weeks after the provisional results are released.

Students can print their official semester results document namely ‘SEMGRED’ through the portal “Campus Online” (campusonline.usm.my) during the second week of the following semester.

2.4 Unit Exemption

2.4.1 Unit Exemption

Unit exemption is defined as the total number of units given to students who are pursuing their studies in USM that are exempted from the graduation requirements. Students only need to accumulate the remaining units for graduation purposes. Only passes or course grades accumulated or acquired in USM will be included in the calculation of the Cumulative Grade Point Average (CGPA) for graduation purposes.
2.4.2 Regulations and Implementation of Unit Exemption

**Diploma holders from recognised Public and Private Institutions of Higher Learning:**

(i) Unit exemption can only be given to courses taken at diploma level.

(ii) Courses for unit exemption may be combined (in two or more combinations) in order to obtain exemption of one course at degree level. However if the School would like to approve only one course at the diploma level for unit exemption of one course at degree level, the course at diploma level must be equivalent to the degree course and have the same number of or more units.

(iii) Courses taken during employment (in service) for diploma holders cannot be considered for unit exemption.

(iv) The minimum achievement at diploma level that can be considered for unit exemption is a minimum grade 'C' or 2.0 or equivalent.

(v) The total number of semesters exempted should not exceed two semesters.

(vi) **In order to obtain unit exemption for industrial training**, a student must have continuous work experience for at least two years in the area. If a student has undergone industrial training during the period of diploma level study, the student must have work experience for at least one year. The students are also required to produce a report on the level and type of work performed. Industrial training unit exemption cannot be considered for semester exemption as the industrial training is carried out during the long vacation in USM.

(vii) Unit exemption for university and option courses can only be given for courses such as Bahasa Malaysia (LKM400), English Language, Islamic and Asian Civilisations and as well as co-curriculum.

**IPTS (Private Institution of Higher Learning) USM Supervised/ External Diploma Graduates:**

- Students who are IPTS USM supervised/external diploma graduates are given unit exemption as stipulated by the specific programme of study. **Normally, unit exemption in this category is given as a block according to the agreement** between USM (through the School that offers the programme) with the IPTS.
Students from recognised local or foreign IPTA (Public Institutions of Higher Learning)/IPTS who are studying at the Bachelor’s Degree level may apply to study in this university and if successful, may be considered for unit exemption, subject to the following conditions:

(i) Courses taken in the previous IPT are equivalent (at least 50% of the course must be the same) to the courses offered in USM.

(ii) Students taking courses at Advanced Diploma level in IPT that are recognised to be equivalent to the Bachelor’s Degree course in USM may be considered for unit exemption as in Section 2.5.

(iii) The total maximum unit exemption allowed should not exceed one third of the total unit requirement for graduation.

2.4.3 Total Number of Exempted Semesters

Semester exemption is based on the total units exempted as below:

<table>
<thead>
<tr>
<th>Total Units Exempted</th>
<th>Total Semesters Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 and below</td>
<td>None</td>
</tr>
<tr>
<td>9 – 32</td>
<td>1</td>
</tr>
<tr>
<td>33 to 1/3 of the total units for graduation</td>
<td>2</td>
</tr>
</tbody>
</table>

2.4.4 Application Procedure for Unit Exemption

Any student who would like to apply for unit exemption is required to complete the Unit Exemption Form which can be obtained from the Examination and Graduation Section or the respective Schools.

The form must be approved by the Dean of the School prior to submission to the Examination and Graduation Section for consideration and approval.

2.5 Credit Transfer

Credit transfer is defined as the recognition of the total number of credits obtained by USM students taking courses in other IPTAs (Public Institution of Higher Learning) within the period of study at USM, and is combined with credits obtained at USM to fulfil the unit requirements for his/her programme of study. The transferred examination results or grades obtained in courses taken at other IPTAs will be taken into consideration in the Cumulative Grade Point Average (CGPA) calculation.
(a) **Category of Students Who Can Be Considered for Credit Transfer**

USM full-time Bachelor Degree level students who would like to attend specific Bachelor Degree level courses at other IPTAs.

USM full-time diploma level students who would like to attend specific diploma level courses at other IPTAs.

(b) **Specific Conditions**

(i) **Basic and Core Courses**

Credit transfer can only be considered for credits obtained from other courses in other IPTAs that are equivalent (at least 50% of the content is the same) with the courses offered by the programme.

Courses that can be transferred are only courses that have the same number of units or more. For equivalent courses but with less number of units, credit transfers can be approved by combining a few courses. Credits transferred are the same as the course units offered in USM. Average grade of the combined courses will be taken into account in the CGPA calculation.

(ii) **Elective or Option Courses**

Students may take any appropriate courses in other IPTAs subject to permission from the School as well as the approval of the IPTAs.

The transferred credits are credits obtained from courses at other IPTAs. No course equivalence condition is required.

(iii) **Minor Courses**

For credit transfer of minor courses, the School should adhere to either conditions (i) or (ii), and take into account the programme requirement.

(c) **General Conditions**

1) The total maximum units transferred should not exceed one third of the total number of units for the programme.

2) Credit exemption from other IPTAs can be considered only once for each IPTA.

3) The examination results obtained by a student who has taken courses at other IPTAs will be taken into account for graduation purposes. Grades obtained for each course will be combined with the grades obtained at USM for CGPA calculation.
4) Students who have applied and are approved for credit transfer are not allowed to cancel the approval after the examination result is obtained.

5) Students are required to register for courses at other IPTAs with not less than the total minimum units as well as not exceeding the maximum units as stipulated in their programme of study. However, for specific cases (e.g., students on an extended semester and only require a few units for graduation), the Dean may allow such students to register less than the minimum units and the semester will not be considered for the residential requirement. In this case, the CGPA calculation will be similar to that requirement of the KSCP.

6) USM students attending courses at other IPTAs who have failed in any courses will be allowed to re-sit the examinations of the courses if there is such a provision in that IPTA.

7) If the method of calculation of examination marks in the other IPTAs is not the same as in USM, grade conversions will be carried out according to the existing scales.

8) USM students who have registered for courses at other IPTAs but have decided to return to study in USM must adhere to the existing course registration conditions of USM.

2.5.1 Application Procedure for Attending Courses/Credit Transfer

USM students who would like to apply to attend courses/credit transfer at other IPTAs should apply using the Unit Exemption Form.

The application form should be submitted for the Dean's approval for the programme of study at least three months before the application is submitted to other IPTAs for consideration.

2.6 Academic Integrity

"Integrity without knowledge is weak and useless. Knowledge without integrity is dangerous and dreadful." - Samuel Johnson

Honesty in academic is important because it is the main pillar in ensuring that manners and ethics with regards to high academic integrity are preserved.

Universiti Sains Malaysia encourages its students to be respectful of and to ensure that any matter relating to academic integrity will be well-preserved. Universiti Sains Malaysia always encourages its students to ensure that manners and integrity would be essential in academics while focusing on their studies in Universiti Sains Malaysia.
These are practices or acts that are considered as conducts which lack integrity in academics:

(a) **Cheating**

Cheating in the context of academics include copying in examinations, unauthorised use of information or other aids in any academic exercise without authorization or in a non-sincere manner. There are numerous ways and methods of cheating which include:

- Copying answers from others during a test or an exam.
- Any suspicious action that can be described as cheating or an attempt to cheat in an exam.
- Using unauthorised materials or devices without authorization (calculator, PDA, mobile phone, pager, or any smart device, and other unauthorized devices) during a test or an exam.
- Asking or allowing another student to take a test or an exam on behalf and vice-versa.
- Sharing answers or programmes for assignments or projects.
- Purposely tampering with marked/graded work after it has been returned, and then resubmitting it for remarking/regrading.
- Give command, to force, persuade, deceive or blackmail others to conduct research, do writing, programming or any task for personal gains.
- Submitting any identical or similar work in more than one course without consulting or prior permission from the lecturers concerned.

(b) **Plagiarism**

The reputation of an academic institution depends on the ability to achieve and sustain academic excellence through the exercise of academic integrity. Academic integrity is based on honesty, trust, fairness, respect, and responsibility, which form the basis of academic work.

One aspect of the loss of academic integrity is due to plagiarism, which is the act of presenting published and unpublished ideas, writings, works or inventions of others in written or other medium, as one’s own original intellectual endeavours without any clear acknowledgement of or reference to the author of the source.

A substantial portion of academic work and research are in the written form and the university is committed in the deterrence of plagiarism.

**POLICY ON PLAGIARISM OF UNIVERSITI SAANS MALAYSIA**

The University Policy on Plagiarism describes USM’s strong commitment to uphold academic integrity in relation to plagiarism. It will come into effect when there is an infringement of academic conduct relating to plagiarism.
This policy acts as a guideline that both educates and prevents and can be used as the basis if anyone that is part of the university violates any rules and laws of the University.

The policy applies to all students, former students, staff and former staff which include fellows, post-doctorates, visiting scholars, as well as academic, non-academic, research, contract and temporary staff who study, serving or having served, or have graduated from the University.

Plagiarism is defined as the act of presenting, quoting, copying, paraphrasing or passing off ideas, images, processes, works, data, personal words or those of other people or sources without any proper acknowledgement, reference to or quotation of the original source(s). The acts of plagiarism include, but are not limited to, the following:

- Quoting verbatim (word-for-word replication of) works of other people.
- Paraphrasing another person’s work by changing some of the words, or the order of the words, without due acknowledgement of the source(s).
- Submitting another person’s work in whole or in part as one’s own.
- Auto-plagiarising or self-plagiarism (one’s own work or previous work) that has already been submitted previously for assessment, or for any other academic award and admitting it as newly-produced without citing the original content.
- Insufficient or misleading referencing of the source(s) that would enable the reader to check whether any particular work has indeed been cited accurately and/or fairly and this identify the original writer’s particular contribution in the work submitted.

The university will take action of every report and offences relating to plagiarism and if the student is found guilty, the student can be charged by the University according to the Students Disciplinary Rules.

(c) Fabrication

Fabrication refers to a process of invention, adaptation or copying with the intention of cheating. This is an act of deceiving other people. Fabrication is somewhat related to matters which have been ‘created’ or altered.

Invention or task outcome or academic work without acknowledgement, alteration, falsification or misleading use of data, information or citation in any academic work constitutes fabrication. Fabricated information neither represent the student's own effort nor the truth concerning a particular investigation or study, and thus violates the principle of truth in knowledge. Some examples are:

- Creating or exchanging data or results, or using someone else’s results, in an experiment, assignment or research
- Citing sources that are not actually used or referred to.
• Listing with intent, incorrect or fictitious references.
• Forging signatures of authorisation in any academic record or other USM documents.
• Forging signatures of authorisation in any academic record or other university documents.

(d) Collusion

Collusion refers to the cooperation in committing or to commit or to do work with negative intentions. Some examples of collusion include:

• Paying, bribing or allowing someone to do an assignment, test/exam, a project or research for you.
• Doing or assisting others in an assignment, test/exam, a project or research for something in return.
• Permitting your work to be submitted as the work of others.
• Providing material, information, or sources to others knowing that such aids could be used in any dishonest act.

(e) Other violations relating to academic integrity

• Arriving late to lecture, tutorial, class or other forms of teaching relating to their courses.
• Sending or submitting any overdue assignment relating to their courses.
• Any other violations that USM considers as violating academic integrity.

2.6.1 Consequences of Violating Academic Integrity

Students are responsible in protecting and upholding academic integrity in USM.

If in any specific event a student or students would encounter any incident that denotes academic dishonesty, the student(s) need to submit a report to the relevant lecturer. The lecturer is then responsible to investigate and substantiate the violation and report the matter to the Dean of the School.

(i) If any violation of academic integrity is considered as not of a serious nature, the Dean of the School can take administrative action on the students.

(ii) However, if the violation is deemed serious by the School, this matter will be brought to the attention of the University Disciplinary Committee for appropriate measures to be taken.

(iii) If a student is caught copying or cheating in an examination, the Investigation Committee on Copying/Cheating in Examinations will pursue the matter according to the university’s procedures. If
the investigation found that there is a case, the student(s) will be brought to the USM University Disciplinary Committee (Academic Matters). Regarding this matter, the University Disciplinary Action will be enforced.

(iv) Measure 48 Measure (Universiti Sains Malaysia) Students Rule of Conduct provides that a student who had committed an inappropriate conduct and is found guilty could be sentenced with either or a combination of or other suitable penalty as listed:

(a) a warning;
(b) a fine not exceeding two hundred ringgit;
(c) exclusion from any specific part or parts of the University for a specified period;
(d) suspension from being a student of the University for a specified period;
(e) expulsion from the University.

Any student(s) found guilty and to be suspended from their studies within a given duration by the University Disciplinary Committee (Academic Matters) or the University Disciplinary Committee (General Matters), the maximum suspension period will not be accounted for them in the completion their studies and while waiting for the verdict to be read.

2.7 USM Mentor Programme

The Mentor Programme acts as a support-aid that involves staff undergoing special training as consultants and guides to the USM community who would like to share their feelings and any psychosocial issues that could affect their social activities. This programme helps individuals to manage psychosocial issues in a more effective manner, which will eventually improve their well-being in order to achieve a better quality of life.

Objectives

(a) To serve as a co-operation and mutual assistance mechanism for dealing with stress, psychosocial problems and many more in order to ensure the well-being of the USM community.

(b) To inculcate the spirit of unity and the concept of helping one another by appointing a well-trained mentor as a social agent who promotes a caring society for USM.

(c) To produce more volunteers to assist those who need help.

(d) To prevent damage in any psychosocial aspect before they reach a critical stage.
2.8 Student Exchange Programme

2.8.1 Study Abroad Scheme

The student exchange programme is an opportunity for USM students to study for one or two semesters abroad at any USM partner institutions. Ideally, students are encouraged to participate in the exchange programme within their third to fifth semester (3 year degree programme) and within the third to seventh semester (4 year degree programme).

USM students who wish to follow the SLBN programme must discuss their academic plans with the Dean or Deputy Dean of their respective Schools and also with the Academic and International Affairs Division of the International Office (to ensure that credits obtained from the external higher education institution can be transferred as part of the credit accumulation for graduation).

Any student that follows the SBLN programme and violates any disciplinary act in the external higher education institution, can be penalised in accordance with the University (Discipline of Students) Rules if the matter is referred to USM.

For further information, please visit http://bhea.usm.my/index.php/international or contact the International Mobility and Career Centre (IMCC) at +604 – 653 2777/ 2774.

2.8.2 Student Exchange Programme in Local Higher Education Institutions (RPPIPT)

This is a programme that allows students of Higher Learning Institutions to do an exchange programme for a semester among the higher institutions themselves. Students can choose any relevant courses and apply for credit transfers.

USM students who want to participate in RPPIPT have to discuss their academic plans with the Dean or Deputy Dean of their respective Schools as well with the Academic Collaboration Unit, Division of Academic and International Affairs (to ensure that credits obtained from the higher education institution in Malaysia can be transferred as part of the credit accumulation for graduation).

Any student who participates in RPPIPT and violates any of the institution’s disciplinary rules can be penalised according to the University (Discipline of Students) Rules if the matter is referred to USM.
2.9 Ownership of Students’ Dissertation/Research Project/Theses and University’s Intellectual Property

2.9.1 Ownership of Students’ Dissertation/Research Project/Theses and University’s Intellectual Property

The copyright of a dissertation/research project/thesis belongs to the student. However, as a condition for the conferment of a degree, the student gives this right unconditionally, directly but not exclusively, and free of royalties to the university to use the contents of the work/thesis for teaching, research and promotion purposes. In addition, the student gives non-exclusive rights to the University to keep, use, reproduce, display and distribute copies of the original thesis with the rights to publish for future research and the archives.
3.0 UNIVERSITY REQUIREMENTS

3.1 Summary of University Requirements

Students are required to take 15 - 22 units of the following University/Option courses for University requirements:

<table>
<thead>
<tr>
<th>University Requirements</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bahasa Malaysia</td>
<td>2</td>
</tr>
<tr>
<td>2 English Language</td>
<td>4</td>
</tr>
<tr>
<td>3 <strong>Local Students</strong></td>
<td>6</td>
</tr>
<tr>
<td>• Islamic and Asian Civilisations (TITAS) (2 Units)</td>
<td></td>
</tr>
<tr>
<td>• Ethnic Relations (2 Units)</td>
<td></td>
</tr>
<tr>
<td>• Core Entrepreneurship* (2 Units)</td>
<td></td>
</tr>
<tr>
<td><strong>International Students</strong></td>
<td></td>
</tr>
<tr>
<td>• Malaysian Studies (4 Units)</td>
<td></td>
</tr>
<tr>
<td>• Option/ Bahasa Malaysia/ English Language (2 Units)</td>
<td></td>
</tr>
<tr>
<td>4 Co-curricular /Skills Courses/Foreign Language Courses/Options</td>
<td>3 – 12</td>
</tr>
<tr>
<td>Students have to choose one of the following:</td>
<td></td>
</tr>
<tr>
<td>• Co-curricular** (1-10 units)</td>
<td></td>
</tr>
<tr>
<td>• Skills Courses/ Foreign Language Courses/Options</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15 – 22</strong></td>
</tr>
</tbody>
</table>

* Students from Schools which have a similar course as this are exempted from taking this course. The units should be replaced with an option course.

** Students from the School of Education Studies are required to choose a uniformed body co-curricular package. Registration for co-curricular courses is compulsory for students from the School of Dental Sciences (SDS). The number of co-curricular units that need to be collected is three (3) units. The breakdown is as follows: (i) 2nd year students must register for one (1) unit of the co-curricular course in semester 1. (ii) 3rd year students must register for (1) unit of co-curricular course in semester 1 AND one (1) unit in semester 2 (further information can be obtained from the SDS Academic Office). Registration for co-curricular courses is compulsory for 1st year students from the School of Medical Sciences (SMS). The number of units that need to be collected for co-curricular courses is two (2) units. The breakdown is as follows: 1st year students must register for one (1) unit of a co-curricular course in semester 1 AND one (1) unit in semester 2 (further information can be obtained from the SMS Academic Office).

Details of the University requirements are given in the following sections.
3.2 Bahasa Malaysia

(a) Local Students

The requirements are as follows:

- LKM400/2 - Bahasa Malaysia IV

All Malaysian students must take LKM400 and pass with the minimum of Grade C in order to graduate.

Entry requirements for Bahasa Malaysia are as follows:

<table>
<thead>
<tr>
<th>No</th>
<th>Qualification</th>
<th>Grade</th>
<th>Level of Entry</th>
<th>Type</th>
<th>Units</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(a) SPM/ MCE/ SC (or equivalent qualification)</td>
<td>1 - 6</td>
<td>LKM400</td>
<td>U</td>
<td>2</td>
<td>Graduation requirement</td>
</tr>
<tr>
<td></td>
<td>(b) STPM/ HSC (or equivalent qualification)</td>
<td>P/S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** To obtain credit units for Bahasa Malaysia courses, a minimum grade of C is required. Students may obtain advice from the School of Languages, Literacies and Translation if they have different Bahasa Malaysia qualifications from the above.

(b) International Students

- International students pursuing Bachelor’s degrees in Science, Accounting, Arts (ELLS), Education (TESL), Housing, Building and Planning and English for Professionals.

All international students in this category are required to take the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LKM100</td>
<td>U</td>
<td>2</td>
</tr>
</tbody>
</table>

- International students (non-Indonesian) pursuing Bachelor’s degrees in Arts.

All international students in this category are required to take the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LKM 100</td>
<td>Z</td>
<td>2</td>
</tr>
<tr>
<td>LKM 200</td>
<td>U</td>
<td>2</td>
</tr>
<tr>
<td>LKM 300</td>
<td>U</td>
<td>2</td>
</tr>
</tbody>
</table>
• International students (Indonesian) pursuing Bachelor degrees in Arts.

The Bahasa Malaysia graduation requirement for this category of students is as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LKM200</td>
<td>U</td>
<td>2</td>
</tr>
<tr>
<td>LKM300</td>
<td>U</td>
<td>2</td>
</tr>
</tbody>
</table>

**Note:** Students must pass with a minimum grade C for type U courses.

### 3.3 English Language

All Bachelor degree students must take 4 units of English Language courses to fulfil the University requirement for graduation.

(a) **Entry Requirements for English Language Courses**

<table>
<thead>
<tr>
<th>No.</th>
<th>English Language Qualification</th>
<th>Grade</th>
<th>Level of Entry</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>*MUET LSP401/402/403/404 † Discretion of Dean</td>
<td>Band 6 A - C</td>
<td>LHP 451/452/453/454/455/456/457/458/459</td>
<td>Compulsory/ Option/Type U (2 Units)</td>
</tr>
<tr>
<td>2</td>
<td>*MUET LSP300 † Discretion of Dean</td>
<td>Band 5 A - C</td>
<td>LSP 401/402/403/404</td>
<td>Compulsory/ Type U (2 Units)</td>
</tr>
<tr>
<td>3</td>
<td>*MUET LMT100 † Discretion of Dean</td>
<td>Band 4 A - C</td>
<td>LSP300</td>
<td>Compulsory/ Type U (2 Units)</td>
</tr>
<tr>
<td>4</td>
<td>*MUET † Discretion of Dean</td>
<td>Band 3/2/1 (Score 0 - 179)</td>
<td>LMT100/ Re-sit MUET</td>
<td>Prerequisite/ Type Z (2 Units)</td>
</tr>
</tbody>
</table>

* MUET: Malaysian University English Test.
† Students may obtain advice from the School of Languages, Literacies and Translation if they have different English Language qualifications from the above.

**Note:**

- Students are required to accumulate four (4) units of English for graduation.
- In order to obtain units in English Language courses, students have to pass with a minimum grade ‘C’.
- Students with a Score of 260 – 300 (Band 6) in MUET must accumulate the 4 units of English from the courses in the post-advanced level (LHP451/452/453/454/455/456/457/458/459*). They can also take foreign language courses to replace their English language units but they must first obtain written consent from the Dean of the School of Languages, Literacies and Translation. (Please use the form that can be obtained from the School of Languages, Literacies and Translation.)
[The number of units for LHP457 is 4 and for LHP451, 452, 453, 454, 455, 456, 458 and 459 is 2.]

- Students with a score of 179 and below in MUET are required to re-sit MUET to improve their score to Band 4 or take LMT100 and pass with a minimum grade ‘C’.

(b) English Language Courses (Compulsory English Language Units)

The English Language courses offered as University courses are as follows:

<table>
<thead>
<tr>
<th>No</th>
<th>Code/Unit</th>
<th>Course Title</th>
<th>School (If Applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LMT100/2</td>
<td>Preparatory English</td>
<td>Students from all Schools</td>
</tr>
<tr>
<td>2</td>
<td>LSP300/2</td>
<td>Academic English</td>
<td>Students from all Schools</td>
</tr>
<tr>
<td>3</td>
<td>LSP401/2</td>
<td>General English</td>
<td>Students from:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>School of Education Studies (Arts)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>School of Fine Arts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>School of Humanities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>School of Social Sciences</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>School of Languages, Literacies and Translation</td>
</tr>
<tr>
<td>4</td>
<td>LSP402/2</td>
<td>Scientific and Medical English</td>
<td>Students from:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>School of Biological Sciences</td>
</tr>
<tr>
<td></td>
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<td>School of Physics</td>
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<td>School of Chemical Sciences</td>
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<td>School of Mathematical Sciences</td>
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<td>School of Industrial Technology</td>
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<td>School of Education Studies (Science)</td>
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<td>School of Medical Sciences</td>
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<td>School of Health and Dental Sciences</td>
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<td></td>
<td>School of Pharmaceutical Sciences</td>
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<tr>
<td>5</td>
<td>LSP403/2</td>
<td>Business and Communication English</td>
<td>Students from:</td>
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<td></td>
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<td>School of Management</td>
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<td>School of Communication</td>
</tr>
<tr>
<td>6</td>
<td>LSP404/2</td>
<td>Technical and Engineering English</td>
<td>Students from:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>School of Computer Sciences</td>
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<td></td>
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<td></td>
<td>School of Housing, Building and Planning</td>
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<tr>
<td></td>
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<td></td>
<td>School of Engineering</td>
</tr>
<tr>
<td>7</td>
<td>LDN 101/2</td>
<td>English For Nursing I</td>
<td>Students from the School of Health Sciences</td>
</tr>
<tr>
<td>8</td>
<td>LDN 201/2</td>
<td>English For Nursing II</td>
<td>Students from the School of Health Sciences</td>
</tr>
</tbody>
</table>
3.4 Local Students - Islamic and Asian Civilisations/Ethnic Relations/Core Entrepreneurship

(a) **Islamic and Asian Civilisations** *(The course is conducted in Bahasa Malaysia)*

It is compulsory to pass the following course (with a minimum grade ‘C’):

HTU 223 – Islamic and Asian Civilisations (TITAS) (2 units)

This course aims to increase students’ knowledge on history, principles, values, main aspects of Malay civilization, Islamic civilization and its culture. With academic exposure to cultural issues and civilization in Malaysia, it is hoped that students will be more aware of issues that can contribute to the cultivation of the culture of respect and harmony among the plural society of Malaysia. Among the topics in this course are Interaction among Various Civilizations, Islamic Civilization, Malay Civilization, Contemporary Challenges faced by the Islamic and Asian Civilizations and Islamic Hadhari Principles.

(b) **Ethnic Relations** *(The course is conducted in Bahasa Malaysia)*

It is compulsory to pass the following course (with a minimum grade ‘C’):

SHE 101 – Ethnic Relations (2 units)

This course is an introduction to ethnic relations in Malaysia. This course is designed with 3 main objectives: (1) to introduce students to the basic concepts and the practices of social accord in Malaysia, (2) to reinforce basic understanding of challenges and problems in a multi-ethnic society, and (3) to provide an understanding and awareness in managing the complexity of ethnic relations in Malaysia. At the end of this course, it is hoped that students will be able to identify and apply the skills to issues associated with ethnic relations in Malaysia.

(c) **Core Entrepreneurship** *(The course is conducted in Bahasa Malaysia)*

It is compulsory to pass the following course (with a minimum grade ‘C’):

WUS 101 – Core Entrepreneurship (2 units)

This course aims to provide basic exposure to students in the field of entrepreneurship and business, with emphasis on the implementation of the learning aspects while experiencing the process of executing business projects in campus. The mode of teaching is through interactive lectures, practical, business plan proposals, execution of entrepreneurial projects and report presentations. Practical experiences through hands-on participation of students in business project management will generate interest and provide a clearer picture of the world of entrepreneurship. The
main learning outcome is the assimilation of culture and entrepreneurship work ethics in their everyday life. This initiative is made to open the minds and arouse the spirit of entrepreneurship among target groups that possess the potential to become successful entrepreneurs. By exposing all students to entrepreneurial knowledge, it is hoped that it will accelerate the effort to increase the number of middle-class entrepreneurs in the country.

For more information, please refer to the Co-curriculum Programme Reference Book.

3.5 International Students - Malaysian Studies/Option

(a) Malaysian Studies

It is compulsory for all international students to pass the following course (with a minimum grade ‘C’):

SEA205E - Malaysian Studies (4 Units)

This course investigates the structure of the Malaysian system of government and the major contemporary trends in Malaysia. Emphasis will be given to the current issues in Malaysian politics and the historical and economic developments and trends of the country. The discussion begins with a review of the independence process. This is followed by an analysis of the formation and workings of the major institutions of government – parliament, judiciary, bureaucracy, and the electoral and party systems. The scope and extent of Malaysian democracy will be considered, especially in the light of the current changes and developments in Malaysian politics. The second part of the course focuses on specific issues: ethnic relations, national unity and the national ideology; development and political change; federal-state relations; the role of religion in Malaysian politics; politics and business; Malaysia in the modern world system; civil society; law, justice and order; and directions for the future.

(b) Option/Bahasa Malaysia/English Language (2 Units)

International students need to fulfil another 2 units of an option course or an additional Bahasa Malaysia/English Language course.

3.6 Co-Curriculum/Skills Courses/Foreign Language Courses/Options

Students have to choose one of the following (A/B):

(A) Uniformed/Seni Silat Cekak/Jazz Band Co-curricular Package (6 – 10 Units)
Students who choose to take packaged co-curricular courses are required to complete all levels of the package. It is compulsory for students from the School of Education Studies to choose a uniformed body co-curricular package from the list below (excluding Seni Silat Cekak). The co-curricular packages offered are as follows:

- Palapes (Reserve Officers’ Training Corps) Co-curricular Package (10 Units) (3 years)

<table>
<thead>
<tr>
<th>ROTC Army</th>
<th>ROTC Navy</th>
<th>ROTC Air Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>WTD103/3</td>
<td>WTL103/3</td>
<td>WTU103/3</td>
</tr>
<tr>
<td>WTD203/3</td>
<td>WTL203/3</td>
<td>WTU203/3</td>
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<tr>
<td>WTD304/4</td>
<td>WTL304/4</td>
<td>WTU304/4</td>
</tr>
</tbody>
</table>

- Co-curricular Package (6 Units) (3 years)

<table>
<thead>
<tr>
<th>Suksis (Students’ Police Volunteers)</th>
<th>The Art of Silat Cekak Malaysia</th>
<th>Jazz Band</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPD101/2</td>
<td>WCC123/2</td>
<td>WCC108/2</td>
</tr>
<tr>
<td>WPD201/2</td>
<td>WCC223/2</td>
<td>WCC208/2</td>
</tr>
<tr>
<td>WPD301/2</td>
<td>WCC323/2</td>
<td>WCC308/2</td>
</tr>
</tbody>
</table>

- Co-curricular/Skills Courses/Options (1 – 6 Units)

<table>
<thead>
<tr>
<th>Kelanasiswa (Rovers)</th>
<th>Bulan Sabit Merah (Red Crescent)</th>
<th>Ambulans St. John (St. John Ambulance)</th>
<th>SISPA (Civil Defence)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WLK102/2</td>
<td>WBM102/2</td>
<td>WJA102/2</td>
<td>WPA103/2</td>
</tr>
<tr>
<td>WLK202/2</td>
<td>WBM202/2</td>
<td>WJA202/2</td>
<td>WPA203/2</td>
</tr>
<tr>
<td>WLK302/2</td>
<td>WBM302/2</td>
<td>WJA302/2</td>
<td>WPA303/2</td>
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</tbody>
</table>

All students are encouraged to follow the co-curricular courses and are given a maximum of 6 units for Community Service, Culture, Sports, Innovation and Initiatives and Leadership (Students from the School of Medical Sciences and School of Dentistry are required to register for a specific number of co-curriculum units and at specific times during their academic year (Please refer to subject 3.1 Summary of University Requirements). Students from the School of Education Studies must take the uniformed co-curricular package [excluding Seni Silat Cekak]. Students who do not enrol for any co-curricular courses or who enrol for only a portion of the 3 units need to replace these units with skills/option courses. The co-curricular, skills and option courses offered are as follows:
<table>
<thead>
<tr>
<th>Community Service (2 Years)</th>
<th>Jazz Band (3 Years)</th>
<th>Karate (3 Semesters)</th>
<th>Taekwondo (3 Semesters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WKM101/2</td>
<td>WCC108/2</td>
<td>WSC108/1</td>
<td>WSC115/1</td>
</tr>
<tr>
<td>WKM201/2</td>
<td>WCC208/2</td>
<td>WSC208/1</td>
<td>WSC215/1</td>
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<tr>
<td></td>
<td>WCC308/2</td>
<td>WSC308/1</td>
<td>WSC315/1</td>
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</tbody>
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<tr>
<th>Non-Packaged (1 Semester)</th>
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<tbody>
<tr>
<td>Culture</td>
<td>Sports</td>
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<tr>
<td>WCC105/1 - Gamelan</td>
<td>WSC105/1 - Bola Tampar (Volley Ball)</td>
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<tr>
<td>WCC107/1 - Guitar</td>
<td>WSC106/1 - Golf</td>
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<tr>
<td>WCC109/1 - Koir (Choir)</td>
<td>WSC110/1 - Memanah (Archery)</td>
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<tr>
<td>WCC110/1 - Kraftangan</td>
<td>WSC111/1 - Ping Pong (Table Tennis)</td>
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<tr>
<td>WCC115/1 - Tarian Moden</td>
<td>WSC112/1 - Renang (Swimming)</td>
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<tr>
<td>WCC116/1 - Tarian Tradisional (Traditional Dance)</td>
<td>WSC113/1 - Aerobik (Aerobics)</td>
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<tr>
<td>WCC117/1 - Teater Moden</td>
<td>WSC114/1 - Skuasy (Squash)</td>
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<tr>
<td>WCC118/1 - Wayang Kulit Melayu (Malay Shadow Play)</td>
<td>WSC116/1 - Tenis (Tennis)</td>
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<tr>
<td>WCC119/1 - Senaman Qigong Asas (Basic Qigong Exercise)</td>
<td>WSC119/1 - Badminton</td>
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<tr>
<td>WCC219/1 - Senaman Qigong Pertengahan (Intermediate Qigong Exercise)</td>
<td>WCC124/1 - Sepak Takraw</td>
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<tr>
<td>WCC124/1 - Kom pang Berlagu</td>
<td>WSC 125/1 - Futsal</td>
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<tr>
<td>WCC127/1 - Kesenan Muzik Nasyid (Nasyid Musical Arts)</td>
<td>WSC 126/1 - Bola Jaring (Netball)</td>
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<tr>
<td>WCC 129 – Latin Dance (Cha Cha)</td>
<td>WSC 128/1 – Petanque</td>
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<td></td>
<td>WSC 129/1 - Boling Padang (Lawn Bowl)</td>
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<td></td>
<td>WSC 130/1 - Orienteering</td>
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<thead>
<tr>
<th>Innovation &amp; Initiative</th>
<th>Leadership (Kepimpinan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCC103/1 - Catan (Painting)</td>
<td>WSC 127/1 - Pengurusan Acara 1 (Event Management 1)</td>
</tr>
<tr>
<td>WCC110/1 - Kraftangan</td>
<td>WSC 227/1 - Pengurusan Acara 2 (Event Management 2)</td>
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<tr>
<td>Course Code</td>
<td>Course Title</td>
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<tr>
<td>WCC120/1</td>
<td>Canting Batik (Batik Painting)</td>
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<tr>
<td>WCC121/1</td>
<td>Seni Khat (Calligraphic Art)</td>
</tr>
<tr>
<td>WCC122/1</td>
<td>Seni Memasak (Culinary Arts)</td>
</tr>
<tr>
<td>WCC125/1</td>
<td>Seni Wau Tradisional (Traditional Kite Art)</td>
</tr>
<tr>
<td>WCC127/1</td>
<td>Kesemian Muzik Nasyid (Art of Nasheed Music)</td>
</tr>
<tr>
<td>WCC128/1</td>
<td>Seni Sulaman &amp; Manik Labucu (Embroidery &amp; Beads Sequins Art)</td>
</tr>
<tr>
<td>WCC 130/1</td>
<td>Seni Fotografi SLR Digital (Digital SLR Photography Art)</td>
</tr>
<tr>
<td>WCC/131/1</td>
<td>Seni Suntingan Fotografi (Editing Photography Art)</td>
</tr>
<tr>
<td>WCC132/1</td>
<td>Seni Seramik (The Art of Ceramics)</td>
</tr>
</tbody>
</table>

(i) **WSU 101/2 - Sustainability: Issues, Challenges & Prospect (2 units)**

**Course Synopsis**

This course introduces and exposes students to the concepts of sustainable development. The course is aimed at ensuring that the ability of the next generation to fulfill their needs in the future will not be jeopardized, especially in an era of globalization that is filled with challenges and rapid advances in information technology. Sustainable development by definition, involves efforts to maintain the balance among the three important aspects, i.e. competitive economy, balanced ecosystem and social integration. For the economic aspect, it touches on the issues of development, economic growth, economic challenges of population, agriculture and industrial sector contributions, finance sector, and also information and technology. Environmental sustainability, on the other hand, focuses on forest and environmental management, marine resource management, eco-tourism, environmental degradation, natural phenomena, global warming, and also ethics in natural resource management. The social integration aspect emphasizes the role of the communities in practising sustainable development in daily life with health management, security (climate change, epidemics, crime and terrorism) and socio-economic network. Sustainable development models and case studies will be discussed too.

For further information, please refer to Co-curricular Guidelines Book.
(ii) HTV201/2 - Teknik Berfikir (Thinking Techniques)

(iii) Other options/ skills courses as recommended or required by the respective Schools (if any)

(iv) English Language Courses

The following courses may be taken as university courses to fulfil the compulsory English Language requirements (for Band 5 and Band 6 in MUET) or as skills/option courses:

<table>
<thead>
<tr>
<th>No</th>
<th>Code/Unit</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>LHP451/2</td>
<td>Effective Reading</td>
</tr>
<tr>
<td>2.</td>
<td>LHP452/2</td>
<td>Business Writing</td>
</tr>
<tr>
<td>3.</td>
<td>LHP453/2</td>
<td>Creative Writing</td>
</tr>
<tr>
<td>4.</td>
<td>LHP454/2</td>
<td>Academic Writing</td>
</tr>
<tr>
<td>5.</td>
<td>LHP455/2</td>
<td>English Pronunciation Skills</td>
</tr>
<tr>
<td>6.</td>
<td>LHP456/2</td>
<td>Spoken English</td>
</tr>
<tr>
<td>7.</td>
<td>LHP457/4</td>
<td>Speech Writing and Public Speaking</td>
</tr>
<tr>
<td>8.</td>
<td>LHP458/2</td>
<td>English for Translation</td>
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<td><em>(Offered only in Semester II)</em></td>
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<tr>
<td>9.</td>
<td>LHP459/2</td>
<td>English for Interpretation</td>
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<tr>
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<td><em>(Offered only in Semester I)</em></td>
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</tbody>
</table>

(v) Foreign Language Courses

The foreign language courses offered by the School of Languages, Literacies and Translation can be taken by students as an option or compulsory courses to fulfil the number of units required for graduation. Students are not allowed to register for more than one foreign language course per semester. They must complete at least two levels of a foreign language course before they are allowed to register for another foreign language course. However, students are not required to complete all four levels of one particular foreign language course. The foreign language courses offered are as follows:

<table>
<thead>
<tr>
<th>Arabic</th>
<th>Chinese</th>
<th>Japanese</th>
<th>German</th>
<th>Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAA100/2</td>
<td>LAC100/2</td>
<td>LAJ100/2</td>
<td>LAG100/2</td>
<td>LAE100/2</td>
</tr>
<tr>
<td>LAA200/2</td>
<td>LAC200/2</td>
<td>LAJ200/2</td>
<td>LAG200/2</td>
<td>LAE200/2</td>
</tr>
<tr>
<td>LAA300/2</td>
<td>LAC300/2</td>
<td>LAJ300/2</td>
<td>LAG300/2</td>
<td>LAE300/2</td>
</tr>
<tr>
<td>LAA400/2</td>
<td>LAC400/2</td>
<td>LAJ400/2</td>
<td>LAG400/2</td>
<td>LAE400/2</td>
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<tr>
<td>French</td>
<td>Thai</td>
<td>Tamil</td>
<td>Korean</td>
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<tr>
<td>LAP100/2</td>
<td>LAS100/2</td>
<td>LAT100/2</td>
<td>LAK100/2</td>
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<tr>
<td>LAP200/2</td>
<td>LAS200/2</td>
<td>LAT200/2</td>
<td>LAK200/2</td>
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<tr>
<td>LAP300/2</td>
<td>LAS300/2</td>
<td>LAT300/2</td>
<td>LAK300/2</td>
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<tr>
<td>LAP400/2</td>
<td>LAS400/2</td>
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</table>
4.0 SCHOOL OF CIVIL ENGINEERING
(http://www.civil.usm.my)

4.1 INTRODUCTION

The School of Civil Engineering was established in 1989. It is now a modern and dynamic school and has an excellent record in providing undergraduate and postgraduate education in a very wide range of topics across the spectrum of civil engineering activities. It has been widely recognised for the high quality of its academic programmes. The School produces competent, creative and highly dedicated graduates in civil engineering who contribute to the human capital development both in government agencies and private sectors. The School has formally adopted the Outcome Based Education system (OBE) since the 2006/2007 academic session to fulfill the Engineering Accreditation Council (EAC) requirements for undergraduate engineering programmes in Malaysia. The Bachelor of Engineering (Honours) (Civil Engineering) programme has been awarded 5 years full accreditation from 2014 to 2018.

The School of Civil Engineering is active in both basic and applied research as well as in consultancy works funded by both government agencies and industries. The School also receives many international students in its postgraduate programmes (PhD and MSc. by research). The MSc. programmes by mixed-mode in Structural Engineering and Environmental Engineering offered by the School are popular, attracting both local and international students.

The School is supported by experienced faculty members (most of them with PhD) and highly trained technical and administrative personnel. It is also equipped with state-of-the-art laboratory facilities backed by fully networked computers. The School is being actively engaged by the industry in the areas of testing for structures and materials, field and laboratory water quality monitoring, air and noise pollution measurement, environmental impact assessment, traffic planning, traffic impact assessment and geotechnical evaluation.

4.2 PHILOSOPHY AND OBJECTIVES

The School of Civil Engineering aims to be a leader at providing the highest quality of undergraduate education available in the country. The task is to provide all students with the opportunity for a broad-based educational experience and to enable students to address complex and comprehensive civil engineering problems. In addition, the school seeks to provide students with the necessary fundamentals for them to advance in the profession in response to the changing technology as well as societal needs and expectations. Last but not least, the school intends to offer the preparation and fostering of intellectual interest needed for graduate studies and research. These objectives are being reflected in the mission statement of the School of Civil Engineering as stated:-

“To nurture and sustain excellence in delivering comprehensive education, imparting knowledge, exploring frontiers of technology, and providing services to the industry and community, at the local and international levels, by applying the
most advanced knowledge and leading expertise, creating innovative ventures, being truthful and by upholding USM’s motto “We Lead”.

The School of Civil Engineering has formally introduced the Outcome Based Education (OBE) process that is focused on achieving certain specified outcomes in terms of individual student learning. The Educational structures and curriculum in the Bachelor of Engineering (Honours) (Civil Engineering) programme USM are designed to achieve those capabilities or qualities highlighted earlier and they are regarded as means not ends. If the outcomes are not achieved they are rethought as to ensure there is a Continual Quality Improvement (CQI) within the education system. OBE is the essential requirement for Malaysia to become a full signatory member of a multinational agreement for the mutual recognition of engineering degrees, i.e. The Washington Accord (WA) in producing engineers ready for industry practice in the international scene.

The Bachelor of Engineering (Civil Engineering) programme has in place the following accreditation requirements:

1. Published Program Educational Objectives (PEO) that is consistent with the mission of the institution;
2. A set of Programme Outcomes (PO) and an assessment process in place to demonstrate that the outcomes are being measured;
3. A curriculum and processes that ensure the achievement of these objectives and outcomes; and
4. A system of ongoing evaluation that demonstrates achievement of these objectives and outcomes by using the results for Continual Quality Improvement (CQI).

Program Educational Objectives [PEO] are statements that describe the expected accomplishments of graduates during the first several years following graduation. The program educational objectives are consistent with the vision and mission of the Universiti Sains Malaysia as shown:

PEO 1 To produce competent, creative and innovative graduates who are able to solve civil engineering problems within the global, societal and sustainable development contexts
PEO 2 To produce graduates with good leadership qualities and communication skills who are able to engage in engineering task both independently and via interdisciplinary team
PEO 3 To produce graduates with professional and ethical attributes
PEO 4 To produce graduates who are engaged in continuous pursuit of knowledge through research, continuing education and/or professional development activities

Program Outcomes [PO] are the abilities that are measurable at the successful end of a student’s academic program in Bachelor of Engineering (Civil Engineering) programme at the Universiti Sains Malaysia. Performance Skills and Abilities are
emphasized throughout the 4-year undergraduate study in order to prepare students to be successful engineers by fulfilling the following outcomes:

PO 1  Able to apply knowledge of mathematics, science and engineering fundamentals to the solution of complex civil engineering problems. “engineering knowledge”

PO2  Able to identify, formulate and solve complex civil engineering problems using first principles of mathematics, natural sciences and engineering sciences. “problem solver”

PO 3  Able to design solutions for complex civil engineering problems to meet specified needs considering public health and safety, cultural, societal, and environmental requirements. “solution designer”

PO 4  Able to conduct investigation into complex problems using research based knowledge and appropriate research methods. “investigative and observant”

PO 5  Able to create, select and apply appropriate modern engineering tools necessary for complex civil engineering activities, with comprehension of the limitations. “comfortable with tools and aids”

PO 6  Able to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional civil engineering practice. “societal sensitive (universal)”

PO 7  Able to appraise the impact of professional civil engineering solutions in societal, environmental contexts and sustainability development. “environment and sustainability-concern”

PO 8  Able to apply ethical principles and commit to professional ethics and responsibilities and norms of civil engineering practice. “ethical”

PO 9  Able to communicate effectively on complex civil engineering activities with the engineering community and with society at large. “communication”

PO 10 Able to function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings. “individually and team player versatility”

PO 11 Able to recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. “life-long learning”

PO 12 Able to demonstrate knowledge and understanding of engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multi disciplinary environments. “take charge and be accountable”

Course Outcomes (CO) are statements of what students know and can do as a result of their respective courses of study. All courses offered in the civil engineering programme are designed with CO’s to quantify teaching and learning assessment, as well as quality assurance.
4.3 MAIN ADMINISTRATIVE STAFF

Prof. Dr. Ahmad Farhan Mohd Sadullah
DEAN

Prof. Dr Taksiah A. Majid
Deputy Dean (Academic, Student and Alumni)

Assoc. Prof. Dr. Choong Kok Keong
Deputy Dean (Research, Postgraduate and Networking)

Dr. Mastura Azmi
Manager (Academic)

Dr. Fadzli Mohamed Nazri
Manager (Quality and Performance)

Dr. Mustafasanie M. Yussof
Manager (Corporate)

Mrs. Norasyidah Mohd Yusoff
Assistant Registrar
## LIST OF ACADEMIC STAFFS

<table>
<thead>
<tr>
<th><strong>Professor</strong></th>
<th><strong>Ext.</strong></th>
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<td>Ahmad Farhan Mohd Sadullah, Dr.</td>
<td>6200</td>
<td><a href="mailto:cefrhn@usm.my">cefrhn@usm.my</a></td>
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- Nor Azazi Zakaria, Dr. 5460 redac01@usm.my

**Lecturer**
- Puay How Tion, Dr. 5494 redac_puay@usm.my

### 4.5 INDUSTRIAL ADVISORY PANEL (IAP)

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
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<tr>
<td>Y. Bhg. Prof. Dato’ Ir. Abang Abdullah Abang Ali</td>
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<td>Ir. Dr. Goh Teik Cheong</td>
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<td>Ir. Muhammad Azman Jamrus Director</td>
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<td>Ir. Chuan Yeong Ming Vice President</td>
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<tr>
<td>Ir. Tan Peng Leak Director</td>
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4.6 LABORATORY FACILITIES

The School of Civil Engineering provides complete laboratory facilities to produce civil engineers that are highly knowledgeable and innovative. Besides academic staffs who are experts in their respective fields of specialization, this school has fully equipped engineering laboratories. These include:

- Environmental Laboratory 1
- Environmental Laboratory 2
- Geotechnical Laboratory
- Highway Laboratory
- Hydraulics Laboratory
- Drawing Room
- Heavy Structures Laboratory
- Light Structures Laboratory
- Geomatics Instrument Portal
- Concrete Laboratory
- Computer Laboratory
- Traffic Laboratory
- Fabrication Workshop

4.7 JOB OPPORTUNITIES

Civil Engineering graduates have a wide job prospect in both government agencies and private sectors. Job prospect include as:

- Consultants
- Contractors
- Developer
- Entrepreneur
- Manager
- Educator

The career specialization may be in one or a few of the following:

- Disaster Management
- Innovative Materials and Sustainable Infrastructure
- Waste Management (solid, water and material)
- Sustainability of Environment and Resources (water, land, clean air)
- Sustainability of Roads and Mobility

4.8 POST GRADUATE STUDIES AND RESEARCH PROGRAMME

The School of Civil Engineering provides the opportunities to those who are interested to further their studies to the higher degree’s level. Higher degree’s programme offers the opportunities to graduates who are qualified to enhance their knowledge in any areas of their interest. Students will be exposed to research techniques and methodologies, which will indirectly contribute towards knowledge expansion and development. Higher degree’s courses which award Masters of Science (MSc.) and Doctor of Philosophy (PhD) degrees can be undertaken through either full time or part time modes. At present, master degree’s programme is
offered by both mixed-mode and research modes. The School of Civil Engineering offers two modes of graduate programme as follows:

**Master of Science and Doctor of Philosophy by Research**

Graduate students in the research mode may choose any topic in their specific area of study. They will be under the supervision of a main supervisor and/or a co-supervisor. In some cases, field supervisors are appointed by the university to assist the graduate. At the end of their study, the students have to submit a thesis to be examined. The graduate may be required to pursue prerequisite courses (if necessary) while or before undertaking the research activities. Applications and registration for research-based programmes are open throughout the year.

**Master of Science by Mixed-mode**

The mixed-mode programmed (coursework and research) is a structured programme whereby students are required to attend lectures, sit for examinations, write a dissertation and be orally examined. The programme is based on a semester system and is offered only in full-time basis. Minimum duration is 1 year. However, the actual duration for graduation is very much dependent on the initiative and performance of individual candidates but subject to a maximum of two academic years. The title of the research project will be mutually agreed upon between the candidate and his/her supervisor. For the award of the Master degree, a candidate has to accumulate 40 units (including dissertation).

**Degree Offered**

The school offers the MSc. Degree Programmes by Mixed-Mode (full time) in the following:

Master of Science in Structural Engineering
Master of Science in Environmental Engineering

Applicants for courses leading to the award of a Master’s degree should possess a Bachelor degree in Civil Engineering or related areas (equivalent to a CGPA 2.75) from a recognized university. A candidate with lower CGPA could be considered for admission based on relevant research and job experiences.

Applicants for admission to PhD programme should possess a MSc. degree from a recognized university or equivalent qualifications acceptable to the Senate of Universiti Sains Malaysia. In exceptional cases, the Senate may admit those in possession of a good Bachelor’s degree.

**Research areas**

The school may supervise research in the following areas:

**Environmental Engineering**

Landfill Technology, Composting, Water and Wastewater Treatment, Industrial Wastewater Treatment, Solid Waste Management, Environment Impact Assessment (EIA), Air Quality and Water Quality Studies, Sludge Management, Noise Pollution Control and Water Quality Modeling.
Geotechnical Engineering

Water Resources Engineering

Transportation & Highway Engineering

Structural Engineering
Concrete Technology, Masonry Engineering, Concrete Repair Materials and Techniques, Structural Health Monitoring and Assessment, Wind Engineering, Earthquake Engineering, Timber Engineering, Tensioned Structures, Shell & Spatial Structures, Computational Mechanics and Advanced Structural Analysis.

Geomatic and Management
### 4.9 Curriculum Structure – Bachelor of Engineering (Honours) (Civil Engineering) Programme

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### 4.9.1 CURRICULUM BY SEMESTER

#### LEVEL 100

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<tr>
<td>EAA273 Civil Engineering Practice</td>
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<td>EAA211 Engineering Mathematics for Civil Engineers</td>
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<tr>
<td>EAG245 Soil Mechanics</td>
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<tr>
<td>EAH221 Fluid Mechanics for Civil Engineers</td>
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<td>EAS253 Theory of Structures</td>
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<tr>
<td>EAP216 Introduction to Environmental Engineering</td>
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<td>EAP315 Wastewater Engineering</td>
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<td>EAH325 Engineering Hydrology</td>
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<td>EAS356 Reinforced Concrete Structural Design II</td>
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<td>EAP316 Air Pollution in Civil Engineering</td>
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<td>EAH316 Hydraulic Structure</td>
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<td>EAP318 Noise Pollution Control</td>
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<td>EAL338 Sustainable Transport</td>
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<td>EAK382 Geographic Information System</td>
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### LEVEL 400

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<td>EAA495 Integrated Design Project</td>
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<td>EAA483 Construction Management</td>
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<td>EAA371 Industrial Training</td>
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<td>EAS457 Structural Steel Design</td>
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<td>EAH417 Urban Water Management</td>
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<td>EAS453 Sustainable Concrete Materials and Practises</td>
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<td>EAG443 Rock Engineering and Tunneling Technology</td>
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<td>EAS458</td>
<td>Pre-Stressed Concrete Design</td>
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<td>EAA484</td>
<td>Building and Construction Technology</td>
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<td>River Conservation and Rehabilitation</td>
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<td>EAS456</td>
<td>Advanced Structural Analysis</td>
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<td>EAG444</td>
<td>Soil Stabilization and Ground Improvement</td>
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<td>EAL434</td>
<td>Transport Planning Process and TIA</td>
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<td>EAA486</td>
<td>Project Management</td>
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* Industrial Training conducted/undertaken at end of Year 3, Semester 2 for 10 weeks
4.10 COURSES DESCRIPTION

EAA110/2 Civil Engineering Drawing
Course Objectives
To give basic knowledge on technical drawing concepts and computer aided drawing (CAD) so that students are able to understand and gain engineering information through engineering drawings and they can prepare engineering drawings for civil engineering applications.

Course Outcomes
Students should be able to
i. Produce engineering drawings manually using appropriate technical drawing technique.
ii. Produce engineering drawings using Computer Aided Drawing (CAD) software.

Course Synopsis
This course is designed to expose the students to the basic understanding of technical in engineering drawings. Students will learn to understand and interpret the element of drawings. During this session, students will be asked to draw and submit individual and group projects that are given to them. After completing this course, students should be able to produce civil engineering drawings using computer aiding drawing (CAD).

References

EAA111/2 Programming for Civil Engineering
Course Objectives
To impart knowledge about the importance of application of Matlab and to develop student's ability in solving civil engineering problems using Matlab.

Course Outcomes
Students should be able to
i. Explain the basic concepts of computer programming.
ii. Write computer programs for civil engineering application.
iii. Present the results of computer programming in civil engineering application.
This is an introductory course in Matlab. It comprised the basic techniques in Matlab programming such as data analysis, graphical techniques, modelling and programming so that Matlab can be applied to solve civil engineering problems.

References

EUM113/3 Engineering Calculus
This course reviews the concept of one and multivariable calculus and covers the concept of ordinary differential equation. This course will provide students with a variety of engineering examples and applications based on the above topics.

Course Objectives
Students should be able to
i. Define the concept of one and multivariable calculus.
ii. Recognize different methods for solving ode.
iii. Use the analytical and numerical methods for solving ode.
iv. Apply the above concepts for solving engineering problems.

Course Synopsi
EAG141/2 Geology for Civil Engineers

Course Objectives
The objectives of Geology for Civil Engineers course are to introduce to the student the principles of physical geology and engineering geology and its application in civil engineering aspects.

Course Outcomes
Students should be able to
i. Apply the principles of physical geology and geological engineering as basis for qualitative engineering judgement.
ii. Analyze geological problems related to civil engineering applications.
iii. Utilize and expand geological engineering principles in civil engineering project planning.

Course Synopsis
Introduction to principles of physical geology and engineering geology and applications in civil engineering covering: Internal and external earth structure, rock forming minerals, igneous rock and magma, sedimentary rock, metamorphic rock, geologic time, geological structure, hydrogeology, geological map, geological environment and hazard, methodology and application of engineering geology in engineering planning, case study involving geological factors in the planning of civil engineering project component.

References

**EAS 151/3**  
**Course Objectives**  
Statics and Dynamics  
To build up the ability to solve problem of rigid body statics and particle dynamics by using the basic principle in engineering mechanics

**Course Outcomes**  
Students should be able to

i. Identify effect of forces on particles and rigid bodies statics problem in engineering
ii. Analyze rigid body statics problem using basic principle and appropriate method
iii. Identify effect of forces on particles dynamics problem in engineering
iv. Analyze particle dynamics problem using method based on Newton’s Law of Motion and energy method

**Course Synopsis**  
Topics covered are:
- Statics: Vectors; Statics of Particles; Systems of Forces and Moments; Rigid Bodies and Structures in Equilibrium; Centroids, Centers of Mass and Moments of Inertia; Friction
- Dynamics: Kinematics and Kinetics of Particles; Method based on Newton’s Law of Motion and Energy Methods in the Solution of Kinetics of Particle Problems

**References**  
EAS 153/3  
**Civil Engineering Materials**  
To provide basic knowledge on important civil engineering materials used in the construction industry which include concrete, steel, timber, brickwork and other construction materials.

**Course Outcomes**  
Students should be able to

i. Apply knowledge on civil engineering materials for solving related civil engineering problems  
ii. Appraise the performance of civil engineering materials when used in construction.  
iii. Carry out concrete mixture proportioning to satisfy specific concrete construction requirements.

**Course Synopsis**  
To provide basic knowledge on important civil engineering materials used in the construction industry which include concrete, steel, timber, brickwork and other construction materials.

**References**  

EUM114/3  
**Advanced Engineering Calculus**  
This course covers the concepts of linear algebra, Fourier series, partial differential equation and vector calculus. This course will provide students with a variety of engineering examples and applications based on the above topics.

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Course Outcomes

Students should be able to

i. Define the concept of linear algebra, Fourier series, partial differential equation and vector calculus.
ii. Explain and use the concept of linear algebra, Fourier series, partial differential equation and vector calculus.
iii. Use numerical methods for solving linear systems.
iv. Apply the above concept for solving engineering problem.

Course Synopsis

Linear algebra: Determinants, inverse matrix, Cramer’s rule, Gauss elimination, LU (Doolittle and Crout), eigen value and vector eigen, system of linear equation, numerical method for solving linear equation: Gause Seidel and Jacobian. Fourier series: Dirichlet condition, Fourier series expansion, function defined over a finite interval, half- range cosine and sine series. Vector Calculus: Introduction to vectors, vector differentiation, vector integration: line, surface and volume, Green’s, Stoke’s and Gauss Div theorems. Partial differential equation: Method for solving the first and second order PDE, linear and nonlinear PDE, wave, heat and Laplace equations.

References


EAK163/4 Geomatics Engineering

Course Objectives

To introduce the concepts and applications of geomatics engineering and an understanding on the use of geomatic equipments, measurement techniques, data analysis and display of survey data.

Course Outcomes

Students should be able to

i. Apply basic knowledge of geomatic engineering in civil engineering application.
ii. Apply the concept of vertical control, horizontal control, detailing and preparation of survey plan.
iii. Solve problems in geomatic engineering and usage of survey instruments
iv. Function effectively among group members towards achieving common goals.
v. Demonstrate ethical principles and professional responsibilities in solving geomatic engineering problems.

**Course Synopsis**

This course includes the topics on the introduction to geomatics engineering, vertical control, horizontal control, detailing, data processing and earthworks.

Field work is divided into 2 components:

Component 1: Practical work encompassing levelling survey, traversing survey, tacheometric surveying, plotting and reporting on all survey works carried out.

Component 2: One week of Annual Intensive Geomatics Practical (AIGP) encompassing intensive practical work at a selected site which includes data processing, display and presentation of work outcomes.

**References**


**EAS 152/3**  
**Course Objectives**  
**Strength of Materials**  
To impart advanced knowledge on numerical methods, probability and statistics that are related to civil engineering and the applications of advanced mathematical knowledge for solving problems in civil engineering

**Course Outcomes**  
**Students should be able to**  
i Apply the basic principles of numerical methods, probability and statistics for solving problems.  
ii Analyse related civil engineering problems using the basic principle of numerical methods, probability and statistics.

**Course Synopsis**  
This course covers the topics of errors in numerical calculation, numerical solution of system of linear and nonlinear equations, numerical method for differentiation and integration, numerical solution of ordinary and partial differential equations and probability and statistics

**References**  

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**EAA211/2**  
**Course Objectives**  
**Engineering Mathematics for Civil Engineers**  
To impart advanced knowledge on numerical methods, probability and statistics that are related to civil engineering and the applications of advanced mathematical knowledge for solving problems in civil engineering

**Course Outcomes**  
**Students should be able to**  
i Apply the basic principles of numerical methods, probability and statistics for solving problems.
ii Analyse related civil engineering problems using the basic principle of numerical methods, probability and statistics.

Course Synopsis
This course covers the topics of errors in numerical calculation, numerical solution of system of linear and nonlinear equations, numerical method for differentiation and integration, numerical solution of ordinary and partial differential equations and probability and statistics.

References

EAH 221/3 Fluid Mechanics for Civil Engineers
Course Objectives
To introduce fundamental theories of fluid mechanics and its applications in the field of civil engineering.

Course Outcomes
Students should be able to
i. Explain fluid mechanics theories and their application
ii. Explain fluid mechanics fundamental characteristics in hydrostatic and kinematic flow
iii. Analyse and solve civil engineering problems using fluid mechanics principles.

Course Synopsis
This course explains the fundamental concepts and theories of fluid mechanics which cover fluid characteristics, hydrostatics and kinematics.

References

EAG245/3 Soil Mechanics
Course Objectives
The objectives of Soil Mechanics course are to introduce to the student the principles that govern the use and application of soil as an engineering material in civil engineering projects and for the student to gain proficiency in the soil classification and quantitative evaluation of soil engineering properties such as stresses, permeability, and for the selection of soil mechanics parameters for the geotechnical application such as compaction, consolidation and settlement.
Course Outcomes

Students should be able to

i. Explain fundamental theories and principles of soil mechanics applied in geotechnical engineering analyses.

ii. Analyze geotechnical engineering problems using fundamental theories and principles of soil mechanics.

Course Synopsis


References

EAA 204/2 Course

Objectives

Structures and Strength of Materials Laboratory

Introducing and provide understanding to students on laboratory test procedures and techniques for strength of materials and concrete technology.

Course

Outcomes

Students should be able to

i Able to relate theory and laboratory works related to strength of materials and concrete technology.

ii Perform laboratory work effectively.

iii Function effectively in a group during laboratory work

Course

Synopsis

This course covers laboratory work for strength of materials and concrete technology.

References

Course Objectives

To provide understanding on preliminary works, drawing and safety at construction site as well as exposure towards basic construction works through practical training.

Course Outcomes

Students should be able to

i. Distinguish the fundamental theories and principles for different civil engineering application

ii. Demonstrate the basic principles and theories in civil engineering practices through practical training.

iii. Work effectively in a group during the civil engineering practical works

Course Synopsis

This course provides knowledge to students on the basic concepts of the civil engineering practice that covers interpretation of various engineering drawings, project implementation, site safety and health, site visit, practical work in the construction of small scale structural elements, scaffolding assembly and basic welding. This course also instils the soft skills through the leadership, teamwork and communication skills.

References

**EAP 215/3 Water Supply and Treatment Engineering**

**Course Objectives**
Delivering knowledge on the principle and practice of water supply and treatment engineering.

**Course Outcomes**
Students should be able to

i. Identify and select water sources, water characteristics, quality and quantity.
ii. Analyse the water demand, population and future development projection.
iii. Design water treatment process and analyse every component of water treatment and distribution system.

**Course Synopsis**
Sources and water use, water source assessment; methods to estimate water consumption; water characteristics, quality, testing and standards; physical, chemical and biological process in water treatment; design of water treatment units; problems and solutions of water quality; water reticulation system.

**References**

**EAP216/3 Introduction to Environmental Engineering**

**Course Objectives**
Explain the basis in environmental engineering and its related components together with the basic method to manage the environment.

**Course Outcomes**
Students should be able to

i. Relate ethics and laws related to environmental engineering
ii. Explain the principles in environmental engineering and its applications.
iii. Identify the impacts of development towards environmental parameters and its protection plan

**Course Synopsis**
This course covers the introduction to environmental engineering fundamentals; introduction to water pollution, noise management,
solid waste, hazardous waste and air quality; and environment management plan and environment impact assessment.

References


EAL235/2 Highway and Traffic Engineering

Objectives

Introducing basic concept of highway engineering that covers route location and unbound bases for pavement and traffic engineering that covers traffic characteristics, road capacity, level of service and design of intersections.

Outcomes

Students should be able to

i. Explain the fundamental principles and important components in highway and traffic engineering.
ii. Analyse problems related to highway and traffic engineering.
iii. Apply knowledge in highway and traffic engineering to solve problems related to traffic congestion in transportation and highway system.

Synopsis

This course covers the introduction to environmental engineering fundamentals; introduction to water pollution, noise management, solid waste, hazardous waste and air quality; and environment management plan and environment impact assessment.

References


EAS 254/3 Structural Analysis

Course Objectives
To equip students with knowledge about two basic methods, i.e. force and displacement methods for the analysis of statically indeterminate structures

Course Outcomes
Students should be able to
i. Analyze statically indeterminate structures using force and displacement methods
ii. Analyze structures using virtual work and plastic methods
iii. Evaluate the effect of loads on structures by means of axial force, shear force, bending moment and deflection.

Course Synopsis
The course covers topics related to analysis of structures using energy, force and displacement methods for statically indeterminate structures (such as trusses, beams and frames) and plastic analysis.

References

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EAH225/3 
Course 
Objectives 

Hydraulics
To introduce the fundamentals of hydraulics and the applications of 
hydraulics in the field of civil engineering.

Course 
Outcomes
Students should be able to
i. Explain various hydraulic theories and their application in 
solving civil engineering problems.
ii. Apply fundamental theories and principles of hydraulics in 
solving hydraulics engineering problems.
iii. Analyse hydraulics problems using hydraulics theories and 
fundamentals for solving problems in civil engineering.

Course 
Synopsis
This course covers energy loss, flow in pipes, dimensional analysis, 
similarities law, hydraulic modeling, open channel flow and gradual 
varied flows.

References

EAA206/2 
Course 
Objectives 

Structures, and Fluid Mechanics Laboratory
Introducing and provide understanding to students on laboratory test 
procedures and techniques for structures, concrete technology and 
fluid mechanics.

Course 
Outcomes
Students should be able to
i. Relate theory and laboratory works related to strength of 
materials and concrete technology.
ii. Perform laboratory work effectively.
iii. Function effectively in a group during laboratory work.

Course 
Synopsis
This course covers laboratory work for structures, concrete 
technology and fluid mechanics

References

EAP 315/3 Wastewater Engineering
Course Objectives To gain knowledge on the principles and practices of wastewater engineering in Civil Engineering field.

Course Outcomes Students should be able to
i. Identify wastewater characteristics.
ii. Predict wastewater flow and loading
iii. Design various physical and biological units for wastewater treatment plant.

Course Synopsis This course covers laboratory work for structures, concrete technology and fluid mechanics

References
EAL 337/3 Pavement Engineering

Course Objectives To introduce the fundamentals of highway engineering that covers route location, drainage, choice of materials, mix design, pavement design, construction and highway maintenance

Course Outcomes Students should be able to
1. Explain the fundamental principles and components in pavement engineering
2. Analyse problems related to pavement engineering
3. Apply pavement engineering knowledge to solve problems related to choice of pavement materials, design and construction


References
EAG 345/3 Geotechnical Analysis

Course Objectives To impart knowledge on analysis of soil mechanics which covers soil shear strength, lateral forces in soil as well as geotechnical structures such as retaining wall, slopes and foundation.

Course Outcomes Students should be able to

i. Explain fundamental theories and principles of geotechnical analysis applied in geotechnical engineering applications.

ii. Analyze geotechnical engineering problems using fundamental theories and principles of geotechnical analyses.

Course Synopsis This course covers topics related to shear strength, lateral forces, retaining wall, slope, shallow foundation, deep foundation and site investigation.

References

EAS353/3  
**Reinforced Concrete Structural Design I**  
Course Objectives  
To impart understanding and knowledge of the design of reinforced concrete for a building structure in accordance with current practices code.

Course Outcomes  
**Students should be able to**  
i. Design structural elements of a building using limit state design principles.  
ii. Design building elements according to current code of practice.  
iii. Organize and contribute in the design group to the successful completion of a comprehensive design project.  
iv. Present clearly and with confidence the design work using various affective communications tools.

Course Synopsis  
This course covers topics related to Reinforced concrete design: structural elements – beam, column, slab, foundation and stairs; checking of serviceability limit state.

References  

EAA305/2  
**Hydraulics, Geotechnical and Environmental Engineering Laboratory**  
Course Objectives  
To introduce and give understanding to the students of procedures and laboratory test techniques for hydraulics, geotechnical and environmental engineering.

Course Outcomes  
**Students should be able to**  
i. Relate theory and laboratory works related to hydraulics, geotechnical and environmental engineering.  
ii. Perform laboratory work effectively.  
iii. Function effectively in a group during laboratory work.
Course Synopsis
This course covers laboratory practices and experiments to ensure student familiarize with the use of various testing equipment and enable them to conduct laboratory tests via hands-on. This course covers laboratory work for hydraulic, geotechnical and environmental engineering.

References

EUP222/3 Engineers In Society
Course Objectives
This course aims to provide basic knowledge and understanding on key principle needed by engineers from an effective society involvement aspect. This course also requires direct involvement of future engineer towards solving a real project problem through critical thinking as well as creative and efficient team work.

Course Outcomes
Students should be able to
i. Explain role of a professional engineer in the society
ii. Suggest solution to complex engineering problems
iii. Apply management theory related to engineers in society collectively
iv. Carry out project management and financial management duties effectively

Course Synopsis
This course provides an introduction to the fundamental principles on project and financial management, ethics and laws related to environment and Occupational Safety and Health Act (OSHA), professional practice as well as effective project management. A comprehensive problem solving solution through success or failure of a particular project is assessed based on an actual case study.
References

5. Laws of Malaysia, Registration of Engineers Act 1967 (ACT 138)
7. Laws of Malaysia, Contracts Act 1950 (ACT 136)
8. Laws of Malaysia, Environmental Quality Act 1974 (ACT 127)
9. Laws of Malaysia, Occupational Safety and Health Act 1994 (ACT 514)
10. Laws of Malaysia, Street, Drainage and Building Act 1974 (ACT 133)
11. Laws of Malaysia, Factories and Machinery Act 1967 (ACT 139)
12. Laws of Malaysia, Uniform Building By Laws 1984

EAH325/3

Course Objectives

To introduce the students to the principles in hydrology in civil engineering.

Students should be able to

i. Interpret rainfall measurement, infiltration and water balance.
ii. Interpret evaporation process, groundwater process and streamflow measurement.
iii. Analyze baseflow, streamflow hydrograph and statistical hydrology

Course Synopsis

Engineering hydrology describes the components and hydrological processes of a river catchment. The course includes data acquisition
and analysis of rainfall, infiltration, evaporation, ground water, streamflow, characteristics of the data, effect of land use, topography and weather on hydrological process. Data analysis using statistical methods and Frequency Analysis, urban drainage and applications in civil engineering are also presented.

References


EAL 338/2 Transportation and Road Safety

Course Objectives

To impart knowledge on transportation engineering and road safety

Course Outcomes

Students should be able to

i. Explain the basic principles and important components in transportation system and its relation with road safety
ii. Analyze transportation engineering and road safety problems
iii. Apply knowledge in transportation engineering and road safety to solve problems related with transportation system.

Course Synopsis

This course covers basic aspect of transportation engineering and road safety that includes transportation organization, concept of sustainable transport and public transport, transportation planning and demand modelling, highway and traffic safety.

References


EAG346/2 Geotechnical Design

Course Objectives
Giving knowledge to student in aspects of geotechnical engineering design for slopes, retaining walls and foundations.

Course Outcomes
Students should be able to
i. Relate geotechnical engineering theories and principles to design solutions.
ii. Analyze components of geotechnical engineering design problems and carry out the necessary designs
iii. Able to produce and demonstrate design solutions in appropriate professional formats through comprehensive group design project

Course Synopsis
Analysis and design of geotechnical engineering covering site investigation works, slope stability (application of computer software for analysis and design), retaining wall and foundation (shallow and deep).

References

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<th>EAS356/2</th>
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<tr>
<td><strong>Course Objectives</strong></td>
<td>This course is the continuity to EAS 353 and with the intension to provide the knowledge pertaining to other reinforced concrete members as well as the introduction to the basic concepts of pre-stressing.</td>
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<th>Course Outcomes</th>
<th><strong>Students should be able to</strong></th>
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<tbody>
<tr>
<td>i</td>
<td>Analyse loading types and forces for design purposes.</td>
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<tr>
<td>ii</td>
<td>Design structural concrete members in accordance to the current code of practice.</td>
</tr>
<tr>
<td>iii</td>
<td>Produce structural drawings and detailing in accordance to the current code of practice.</td>
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| Course Synopsis | This course covers determination of structural capacity of piles; effect of lateral force and eccentricity to the pile capacity, design of pile cap, flat slab, retaining wall, basement wall and introduction to pre-stressed concrete |


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<th><strong>Geotechnical, Highway and Traffic Engineering Laboratory</strong></th>
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<tbody>
<tr>
<td><strong>Course Objectives</strong></td>
<td>Introducing and providing understanding to students on laboratory test procedures and techniques in geotechnical, highway and traffic engineering.</td>
</tr>
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</table>
Course Outcomes

Students should be able to

i. Relate theory and laboratory works related to geotechnical, highway and traffic engineering.
ii. Perform laboratory work effectively.
iii. Function effectively in a group during laboratory work.

Course Synopsis

This course covers laboratory practices and experiments to ensure students are familiar with the use of various test equipments and enables them to conduct laboratory tests via hands-on. Laboratory tests for this course covers direct shear test, unconfined compression strength test, consolidation test and triaxial test; aggregate tests; binder tests, determination of soil subgrade California Bearing Ratio, asphalt mix design, spot speed, determination of saturation flow at junction, use of software to determine traffic light performance and programming traffic light set up.

References

British Standards Institution, London


EAP316/2

Course

Air Pollution In Civil Engineering

Objectives

To give knowledge on assessment aspects, analysis and control of air pollution related to civil engineering.

Course

Students should be able to

Outcomes

i. Demonstrate understanding of basic legislations related to air pollution in civil engineering activities.

ii. Assess sources of air pollutants from civil engineering related activities and their effects on human, biota and built environment.

iii. Measure major parameters of air pollutant and identify equipment to control or reduce them.

Course

Synopsis

This course discuss topics related to national legislations related to air pollution; general and specific sources; effects; sampling and measurements; meteorological conditions and effects on dispersions; air pollution control equipments

References


EAH 316/2  
**Course**  
**Objectives**  
**Course Outcomes**

**Students should be able to**  

i Design for hydraulic outlet structures and diversion works in civil engineering  

ii Design for energy dissipation and dam outlet works in civil engineering  

iii Design pumps and pump station in civil engineering

**Course Synopsis**

This course describes aspects of hydraulic outlet structures, diversion works, energy dissipation and dam outlet works, and pumps and pump station.

**References**


EAS358/2  
**Course**  
**Objectives**  
**Course Outcomes**

**Students should be able to**  

i Explain the basic concepts, philosophies and requirements in structural design of timber and masonry.  

ii Relate the mechanical behavior and characteristics of timber as well as masonry with those of design requirements.  

iii Undertake structural design of timber and masonry based on appropriate current code of practice.

**Course Synopsis**

Introduction to fundamental concepts, design philosophy, properties and mechanical characteristics of timber and masonry structures. Timber design covers flexural, axially loaded members and combined bending and axial forces, diaphragms and shear walls,
design of connections and advanced topics in structural timber. In masonry design, it covers design of unreinforced and reinforced masonry walls under gravitational and lateral loading together with simplified design approach for masonry buildings.

References
6. MS 2421 Pt.1: Structural use of unreinforced masonry
7. MS 2421 Pt 2: Structural use of reinforced and prestressed masonry
8. MS 2421 Pt 3: Materials and components, design and workmanship
9. MS 544 Pt 1: Code of practice for structural use of timber
11. MS 544 Pt. 5: Code of practice for structural use of timber : Timber Joints

EAP318/2 Noise Pollution Control
Course Objectives
To provide knowledge about aspects of assessment and control of noise pollution

Course Outcomes
Students should be able to
i. Identify various sources and parameters of noise pollution that give impact to human health
ii. Evaluate main parameters of noise pollution based on related environmental regulation.
iii. Suggest alternative solutions for noise pollution control method

Course Synopsis
Introduction of noise pollution; important characteristics of sound, effect and regulation of noise pollution, measurement and analyses of noise, noise pollution control.

References
3. De Visscher, A. Air dispersion modeling : foundations and
EAL339/2
Course Objectives

Sustainable Transport

Sustainable transport;
to understand impact of transport towards sustainability; sustainable transport systems; contributors to sustainable transport and unsustainability; transit oriented development and planning issues, influencing governance and policies.

Sustainable asphalt
To provide knowledge about concept, requirements and types of materials, long life asphalt, warm mix asphalt, recycle asphalt pavement, porous asphalt, plant based binders, waste materials as modified binders.

Course Outcomes

Students should be able to

i. Explain the concept of transport sustainability and the important of its equilibrium in transport engineering

ii. Measure the performance of sustainable transport and sustainable asphalt based on performance indicators.

iii. Analyse suitable measurement method in solving the
problems related with sustainable transport. Demonstrate a good relationship and interaction between group members.

**Course Synopsis**

Introduction to sustainability, environment, social and economic impact, performance index, sustainable transport system, contributors to sustainability and unsustainability; sustainable asphalt, warm mix asphalt (WMA), recycle asphalt pavement (RAP), porous asphalt, plant based binder, use of waste material as binder modifiers.

**References**


**EAK382/2 Geographical Information Systems**

**Course Objectives**

Provide an understanding of the fundamental concepts of geographic information systems with an emphasis on mapping method, collection, processing, and analysis of spatial data that is common to civil engineering applications.

**Course Outcomes**

**Students should be able to**

i. Describe the basic spatial concepts and data models that form the foundation of GIS.

ii. Solve complex geo-spatial problems using GIS software.
iii. Relate solutions to complex spatial problem with the environment and sustainability.

Course Synopsis
This course covers the basic introduction to geographic information systems (GIS), functions and components of GIS, introduction to spatial database management, spatial analysis, surface modelling, pathway analysis, and site suitability analysis particularly its applications to civil engineering.

References

EAA371/5 Industrial Training
Course Objectives
This course gives the exposure towards the actual practice in civil engineering through wide and structured industrial training.

Course Outcomes
Students should be able to
i. Relate theory and practice in civil engineering throughout an industrial training period and reporting it.
ii. Communicate effectively in expressing various stages of the experience in the industry.
iii. Record the experience of solving civil engineering problems during industrial training.

Course Synopsis
The training provides industry exposure to students for 10 weeks long in order to develop the professional skills in civil engineering practice though involvement in real jobs.

References
1. Program Internship Pelajar USM, Kampus Kejuruteraan.

EAS457/2 Structural Steel Design
Course
To impart understanding and knowledge of the design of steel
Objectives
structures in accordance with the code of practice of the current design.

Course Outcomes

Students should be able to

i. Design structural elements of a building using limit state design principles.
ii. Design building elements according to current code of practice.
iii. Organize and contribute in the design group to the successful completion of a comprehensive design project.
iv. Present clearly and with confidence the design work using various affective communications tools.

Course Synopsis
This course covers the introduction of design for steel, design considerations, design of flexural member, compression member, tension member, connections, roof trusses, plate girder and portal frames. Current code of practice will be used as codes of practice in the design calculation of steel structures.

References

EAA483/2 Construction Management

Course Objectives
This course applies management aspects and analysis tabulation for construction management.

Course Outcomes

Students should be able to

i. Demonstrate effective construction management knowledge towards industry practice.
ii. Explain the value of construction management concepts in project practice.
iii. Analyse problems related to construction management activities.
Synopsis

the development of construction management covering the knowledge are based on the construction fields.

References


EAA492/6

Course Objectives

Final Year Project

To impart knowledge on civil engineering related problems by carrying out and providing solutions to research problem and presenting the output in written and oral forms.

Course Outcomes

Students should be able to

i  Identify the specific research problem statement through a literature review.
ii  Develop the appropriate methodology to achieve the research objectives.
iii  Present the research work in the form of a dissertation.
iv  Orally present the research findings.

Course Synopsis

This course provides learning experience to the students in various skills throughout the course including research initiative, technical expertise, written and oral reporting skills.

References

1. Final Year Project Manual, (2015), School of Civil Engineering, USM.
2. Final Year Project Friday Lecture Notes.
5. Civil Engineering Text Books.

EAA495/4

Course Objectives

Integrated Design Project

To carry out integrated design work covering various specialization in civil engineering area.

Course Outcomes

Students should be able to

i.  Gather technical information from various civil engineering sub-areas in implementing a project.
ii. Describe development works from beginning to the end.
iii. Extract materials from civil engineering manuals and guidelines, considering sustainability aspects.

iv. Design structures, foundation, transport, pavement, drainage, and other aspects of a development work.

v. Interact between members of a working group and work as a team - as a leader and as a member.

vi. Prepare and present integrated design report.

**Course Synopsis**

This course integrates various sub-areas of the civil engineering knowledge that covers (but not limited to) preliminary planning, earthwork, impact studies, building and infrastructure design, geotechnical design as well as project management. Based on a given project development, students communicate, interact and work as a team to produce comprehensive engineering proposals including site investigation, local authority/regulating body requirements, design, technical specification and engineering drawings.

**References**

1. Lecture Notes
2. Local and International Civil Engineering Journals
3. Web references and portals in Civil Engineering
4. Civil Engineering Text Books
5. Local and International Civil Engineering Manuals

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**EAP415/2 Solid Waste Management**

**Course Objectives**

Introduction to principles of solid waste management

**Course Outcomes**

Students should be able to

i. Explain the principles of waste management.

ii. Identify and analyse problems regarding solid waste management.

iii. Give ideas and prepare alternative solutions to problems and design regarding solid waste management.

**Course Synopsis**

This course covers topics related to definition of solid waste, laws and regulations regarding solid waste management, engineering principles in waste management, treatment of solid waste and ultimate disposal.

**References**


**EAH417/2**  
**Urban Water Management**  
To provide detailed knowledge on the management of urban drainage in civil engineering

**Course Objectives**

**Course Outcomes**
1. Identify the aspects of urban drainage scheme which applies the concept of environmental friendly drainage in civil engineering.
2. Analyse urban drainage design alternative solutions based on the practices of the relevant authorities.
3. Design urban drainage systems with regard to sustainable development.

**Course Synopsis**

This course explains on the aspects of urban drainage management, control at source, environmental friendly drainage system, hydrological analysis, Best Management Practices (BMPs), Quantity Control, Quality Control, detention pond, retention basin, swale and computer modelling which are based on environmentally friendly drainage concept.

**References**

**EAS455/2**  
**Sustainable Concrete Materials and Practices**  
To give exposure on the aspects of concrete technology with regards
Objectives

to the perspectives of durability and deterioration of concrete structures, admixtures, production, properties and application of special concretes besides normal concrete, non and semi-destructive testing techniques, as well as repair techniques.

Course Outcomes

Students should be able to

i. Explain the measures to produce concrete with superior properties and durability performance under certain exposure conditions via the use of suitable mixture proportions and admixtures.

ii. Evaluate defects and deterioration problems in concrete structures with the aid of semi and non-destructive testing techniques.

iii. Propose suitable repair materials and repair techniques to retrofit concrete structures with certain

Course Synopsis

The course covers the durability and deterioration of concrete structures, utilization of admixtures in concrete, special concretes, non and semi-destructive testing techniques, and concrete repair techniques.

References

### EAG 443/2
#### Course Objectives
**Rock Engineering and Tunnelling Technology**
Introduce to the students the fundamental principal of rock engineering and its applications in civil engineering together with the tunneling technology for underground excavation

#### Course Outcomes
**Students should be able to**

i. Explain fundamental principal of rock engineering and tunneling technology for underground excavation

ii. Analyze problems related to rock engineering and underground excavation

iii. Design solutions to problem related to rock engineering and underground excavation.

#### Course Synopsis
This course covers key aspects of rock engineering and underground excavation including the discontinues nature of rock mass, seepage in rock mass and groundwater control methods, laboratory and in-situ rock testing, shear strength of intact rock and rock mass, rock mass classification, joint orientation and how to plot it (stereographic projection), rock engineering application in underground excavation and rock slope and tunnelling technology in underground excavation.

#### References

### EAL 431/2
#### Course Objectives
**Highway Design**
To understand highway geometric design method that covers alignment, cross section, at-grade and grade-separated intersections taking into consideration road safety aspects.

#### Course Outcomes
**Students should be able to**

i. Explain basic elements in highway geometric design

ii. Design elements in highway geometry that covers horizontal alignment, vertical alignment, cross section and intersection
according to local standards

iii. Produce highway geometric design in the form of report and drawings

Course Synopsis

Introduction: Driver characteristics, design vehicle, road hierarchy, access control, topography, design speed, sight distance; Horizontal Alignment: the straight, simple circular curve, transition curve, superelevation, curve widening; Vertical Alignment: the straight, summit and valley curves; Cross Section: camber, right of way, traffic lanes, road shoulder, marginal strip, central reservation; At-grade intersection: types, distance between junction, sight distance, left turning lane, speed change lane, traffic island; Grade-Separated Intersection: justification for provision, types and distance between interchange; Geometric Design and Road Safety: five stages and elements in road safety audit.

References


EAS 485/4 Disaster Management

Course Objectives

To expose students to the disaster and natural disaster risk reduction methods.

Course Outcomes

Students should be able to

i. Explain the concepts and cycle of disaster management;

ii. Propose solutions for natural disaster risk reduction.
Course Synopsis
This course provides knowledge about disaster management including disaster management cycle, policy and mechanism of disaster management, types of disaster, risk, hazard and vulnerability, management and reduction of disaster risk and post-disaster rehabilitation.

EAA484/2
Building and Construction Technology
Course Objectives
To impart knowledge and understanding on basic construction work in civil engineering field.

Course Outcomes
Students should be able to
i Describe current building sustainability construction practice.
ii Able to differentiate construction technique in civil engineering.
iii Identify construction material and specification related in the construction process.
iv Evaluate with appropriate justification in solving pre construction and post construction problem

Course Synopsis
This course covers the basic principles of civil engineering construction of buildings and the preparation of construction specifications.

References

EAP414/2
Industrial Waste Management
Course Objectives
To impart knowledge on the theory and practice of Industrial waste management
Course Outcomes

Students should be able to

i  Categorize and differentiate various processes in industrial waste management.
ii  Explain various pollution sources and parameters and to find alternative solutions to the control.
iii  Propose alternative management and treatment system of industrial waste.

Course Synopsis

Industrial waste management – Terminology and legislation aspect; Identification And Classification, Waste handling; Waste reduction and cleaner production; Treatment and disposal of non-hazardous industrial waste; Treatment and disposal of hazardous industrial waste; Clinical waste management, Electronic and electrical waste management.

References


EAH416/2

Course Objectives

River Conservation and Rehabilitation

To introduce river conservation and rehabilitation of river through the perspective of sediment transportation and solving open channel flow with mathematical techniques.

Course Outcomes

Students should be able to

i  Analyse and solve river management issues.
ii  Solve relevant issues using mathematical techniques.

Course Synopsis

This course explains the basic characteristics of natural river, conservation and rehabilitation of rivers.
## References


## EAS456/2 Advanced Structural Analysis

### Course Objectives

Provides knowledge to students on advanced method of structural analysis and introduction to design of structures under wind load and earthquake load.

### Course Outcomes

Students should be able to

i. Apply advanced analysis method for structural analysis.
ii. Analyse structures considering dynamic effect.

### Course Synopsis

This course provides knowledge about: advanced method of structural analysis which covers matrix method and finite element method; structural dynamics; introduction to design of structures under wind load and earthquake load.

### References

12. Malaysian Standard on Wind Loading on Structures, MS1553, 2002, SIRIM

**EAG444/2**

**Course Objectives**

**Soil Stabilization and Ground Improvement**

The objectives of this Soil Stabilization and Ground Improvement course are to introduce to the students the advance geotechnical engineering aspect soil and slope remediation and stabilization, soil reinforcement and ground improvement.

**Course Outcomes**

**Students should be able to**

i Explain the principles of geotechnical engineering related to soil stabilization and ground improvement.

ii Analyse geotechnical problems related to soil stabilization and ground improvement.

iii Design solutions to geotechnical engineering problems related to soil stabilization and ground improvement.

**Course Synopsis**

This course covers key aspects of soil stabilization and ground improvement which are related:

i Soil stabilization and ground improvement including factors and categories of failures, method of investigation and forensic,
remediation and stabilization work.

ii Soil reinforcement including aspects and functions related to design.

iii Ground improvement technique for soft and weak soil

References


EAL 434/2 Transport Planning Process and Traffic Impact Assessment (TIA)

Course Objectives

To understand the complete transport planning process, with emphasis on advance travel demand modelling, provision of supply and procedure involved in traffic impact assessment.

Course Outcomes

Students should be able to

i. Explain the fundamental principles and current issues in transportation planning and traffic impact assessment.

ii. Analyse problems related to transportation planning and traffic impact assessment in a comprehensive manner.

iii. Apply transportation models to solve problems related to transportation planning and traffic impact assessment.

102
Course Synopsis
This course covers the transportation planning process related to transport demand modelling and the procedure involved in traffic impact assessment.

References

Course Objectives
This course is offered in order to provide knowledge and understanding on the basic principles of pre-stressed concrete design.

Course Outcomes
Students should be able to
i. Identify stress limit (at transfer and service) and estimating minimum cross section of pre-stressed beam.
ii. Analyse problems with justifications and design pre-stressed concrete beam in accordance to current code of practice.
iii. Present design output in the form of report, tendon profile drawing and detailing in accordance to current code of practice.

Course Synopsis
This course covers the basic principles in the analysis and design of pre-stressed concrete beam in accordance to the current code of practice.

References

EAA486 Course Objectives

Project Management
This course is to apply aspects of management and scheduling for project development.

Course Outcomes

Students should be able to
1. Attempting to explain the basic concepts of project management in engineering projects.
2. Attempting to demonstrate knowledge of project management that are appropriate for the effective development of the project.
3. Attempting to analyze aspects of sustainable project management efficiently

Course Synopsis
This course applies Project Management concepts and applications in the development of engineering project covering the knowledge are based on the PMBOK method.

References
Advanced Engineering Calculus (63)
Advanced Structural Analysis (100)
Air Pollution in Civil Engineering (85)
Building and Construction Technology (97)
Civil Engineering Drawing (59)
Civil Engineering Materials (63)
Civil Engineering Practice (69)
Concrete, Structures and Fluid Mechanics Laboratory (74)
Construction Management (91)
Disaster Management (97)
Engineering Calculus (60)
Engineering Hydrology (80)
Engineering Mathematics for Civil Engineers (66)
Engineers in Society (79)
Final Year Project (92)
Fluid Mechanics for Civil Engineers (67)
Geographical Information System (89)
Geology for Civil Engineers (61)
Geomatic Engineering (64)
Geotechnical Analysis (64)
Geotechnical Design (77)
Geotechnical, Highway and Traffic Engineering Laboratory (83)
Highway and Traffic Engineering (72)
Highway Design (96)
Hydraulic Structure (86)
Hydraulics (73)
Hydraulics, Geotechnical and Environmental Engineering Laboratory (78)
Industrial Training (90)
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Integrated Design Project (92)
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Reinforced Concrete Structural Design I (78)
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River Conservation and Rehabilitation (99)
Rock Engineering and Tunneling Technology (95)
Soil Mechanics (67)
Soil Stabilization and Ground Improvement (101)
Solid Waste Management (93)
Statics and Dynamics (62)
Structural Steel Design (90)
Strength of Materials (65)
Structural Analysis (72)
Structures and Strength of Materials Laboratory (68)
Sustainable Concrete Materials and Practices (94)
Sustainable Transport (88)
Theory of Structures (68)
Timber Engineering (86)
Transportation and Road Safety (81)
Transport Planning Process and TIA (102)
Urban Water Management (94)
Wastewater Engineering (75)
Water Supply and Water Treatment Engineering (70)
6.0 STUDENT’S FEEDBACK

The aim of this feedback form is to obtain students’ response regarding the contents of this Guidebook. The information obtained will be useful in improving it.

Please respond to items 1 – 5 below based on the following 4-point scale:

1 = Strongly disagree  2 = Disagree  3 = Agree  4 = Strongly agree

1. This Guidebook is very useful.

2. The information provided in this Guidebook is accurate.

If you choose 1 or 2 for Question no. 2, please state the page number that contains information that is inaccurate in the space below:

3. The information provided in this Guidebook is clear and easy to understand.

4. On the whole, the quality of this Guidebook is good.

5. I prefer to use CD compared to this Guidebook.

6. If you think other information should be included to make this Guidebook better, please write your suggestions in the space below:

Please submit this feedback form to your School’s General Office in the 4th week of Semester I, Academic Session 2016/2017.