

# **Student Hand Book**

## **Faculty of Engineering**

**South Asian Institute of Technology and Medicine (SAITM)**

**Malabe, Sri Lanka**

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# 1 Introduction

## 1.1 SAIMT Faculty of Engineering

South Asian Institute of Technology and Medicine (SAITM), founded by Dr. Neville Fernando (MBBS) in the year 2008, is the first non-state sector multi-faculty higher educational institute in Sri Lanka. Recognized by the University Grants Commission (UGC) of Sri Lanka as a degree awarding institute, the campus is located in a picturesque setting with all modern amenities and requirements at Malabe, in the District of Colombo.

Established on the 1st of July 2009, SAIMT Faculty of Engineering is offering study programs in Engineering leading to BSc. (Honors) degrees in affiliation with the Asian Institute of Technology (AIT), Thailand. Students who enroll in the program will be completing the first two years of the 4 year degree program at SAIMT in Sri Lanka before transferring to AIT for the final 2 years.

This student hand book will provide a complete guide with regard to the courses offered and other related details at SAIMT Faculty of Engineering.



Dr. Neville Fernando  
MBBS (Ceylon)

## 1.2 Message from the Dean, Faculty of Engineering

It is a well known fact that the world is in need of more and more engineers to sustain life on the planet. The massive amount of infrastructure development and services required in keeping with the rising world population and occurrence of unprecedented natural catastrophes, demand that engineers take the leadership in guiding the humankind into a stable and safer era in which all human beings can exist with basic amenities and freedom. It is also important that re-building and new developments are based on sustainable principles.

With the world economic power shifting to Asia it is inevitable that the global knowledge base in the future will be firmly established in that region with more and more intellectual and skilled personnel produced. In the light of these developments it is an important and timely step that South Asian Institute of Technology and Medicine (SAITM) setting up a fully fledged Faculty of Engineering, becoming the pioneering non-state sector higher education institute to produce quality Engineering graduates, who will be capable of meeting the local, regional and international standards.

Faculty of Engineering of SAIMT within the short period of time since its establishment has set up fully functional state of the art engineering laboratories and a team of top academics drawn from local and foreign universities in addition to all the necessary infrastructure facilities for a world class engineering education. With the backing of the Asian Institute of Technology (AIT), with whom SAIMT engineering programs are affiliated, our engineering undergraduates can obtain a top quality internationally recognized honors degree in Bachelor of Science which certainly can be considered a great boon for the youth of Sri Lanka and the South Asian region.

## 1.3 Faculty Mission

To become a Faculty which will continue to produce world class Engineers, highly employable with a solid background in advance Engineering knowledge, research and hands on skills training who will be employable anywhere in the world and ready to face future challenges with discipline and confidence.

## 2 Organization and Administration of Faculty of Engineering

### 2.1 Departments

Faculty of Engineering consists of two departments as follows,

- Department of Civil and Infrastructure Engineering
- Department of Mechatronics Engineering

### 2.2 Staff

#### 2.2.1 Academic Staff

##### **General Contact Information:**

Faculty of Engineering,  
South Asian Institute of Technology and Medicine (SAITM),  
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##### **Dean, Faculty of Engineering**



Dr. S. Sendanayake  
*B.Sc. Eng (Hons.), M.Sc. PhD (Moratuwa).*  
Ext: 207                      Room: 201  
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sisuru.saitm@gmail.com

##### **Head/ Department of Civil & Infrastructure Engineering**



Dr. R. S. Mallawaarachchi  
*B.Sc. Eng (Hons.), PhD (Moratuwa), AMIESL.*  
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rajeev.saitm@gmail.com

##### **Head/ Department of Mechatronics Engineering**



Eng. W. G. C. W. Kumara  
*B.Sc. Eng (Hons.) M.Eng. (AIT), AMIESL.*  
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chinthaka.saitm@gmail.com

### Head/ Civil Engineering Research



Dr. N. Miguntanna  
*B.Sc. Eng (Hons.) (Peradeniya) , PhD (QUT).*  
Ext: 212 Room: 220  
email: nandika.m@saitm.edu.lk,  
nandika.saitm@gmail.com

### Lecturer in IT



Mr. T. Gunarathne  
*B.Sc. M.Sc. (UK).*  
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tharanga.saitm@gmail.com

### Lecturer in Electronics and Telecommunications



Dr. Thilini Rajakaruna  
*B.Sc. Eng (Hons)(Peradeniya) , PhD (Surrey, UK)*  
Ext: 229 Room: 221  
email: thilini.r@saitm.edu.lk

### Lecturer in Civil & Infrastructure Engineering



Dr. Kushan Kalmith Wijesundara  
*B.Sc. (Hons), MSc (Pavia,Italy), PhD (Pavia,Italy)*  
Room: 204  
email: kushan.w@saitm.edu.lk

### Research Assistant Dept. of Mechatronics Engineering



Miss. P. Liyana Arachchi  
*B.Sc. Eng (Moratuwa)*  
Room: 204 email: priyanka.l@saitm.edu.lk

### Visiting Faculties

Name	Designation	Qualifications
Mr. K. J. C. Kumara	Visiting Consultant	B.Sc. Eng (Hons.) M.Sc. (Moratuwa) M.Sc. (Japan)
Dr. M. Gamage	Visiting Lecturer	B.Sc. Eng (Hons.) M.Eng.(UEC) PhD(UEC)
Eng. K. S. M. Silva	Visiting Lecturer	B.Sc. Eng (Hons.) M.Eng. Cent MIE(SL) DIPM(UK) MSSE(SL)
Mrs. C. P. N. Attygalle	Visiting Lecturer	B.Sc. M.Sc. (Applied Statistics)
Dr. K. Gamage	Visiting Lecturer	B.Sc. Eng (Hons.) M.Eng.(Monash) PhD(Monash)
Dr. R. Rodrigo	Visiting Lecturer	B.Sc. Eng (Hons.) M.Eng.(Canada) PhD(Canada)
Mr. T. I. Alles	Visiting Lecturer	Specialist English Trained
Mr. Susantha Hewa	Visiting Lecturer	B.A. (English Special), M.A.(Linguistics)

## 2.2.2 Non Academic Staff

### Registrar



Mrs. W. H. R. Hussain  
*BA (Special) in Economics (Sri J.),*  
*PG Dip. in Economic Development (Col.),*  
*MPA (Sri J.)*  
Ext: 104 email: info@saitm.edu.lk

### Bursar



Mr. A. P. Galhena  
*B.Sc (Sri J.), Chartered Finalist*  
Ext: 226 email: galhena.p@saitm.edu.lk

### Faculty Coordinator



Miss. N. Perera  
*B.Sc. CIMA passed finalist*  
Ext: 201 Room: 201  
email: nayomi.p@saitm.edu.lk

### Lab Technician



Mr. M. Wickramasinghe  
Room: G06

## 3 Degree Program and Administration

### 3.1 Entry Requirements:

Minimum 3 passes from local or London A/L's including Mathematics, Physics and Chemistry or IT.

### 3.2 Examination Rules

#### 3.2.1 Evaluation of Performance

The performance of each course will be evaluated by giving different weights to the following course requirements – Mid Semester examination, Assignments, Laboratory Work and Final Examination. All requirements except the Final Examination carries a combined weight of not less than 30% and not more than 60% of the total marks, except in internship, camps, research projects and other similar requirements.

The course requirement may be based on a specified combination including laboratory work, tutorials, quizzes, presentations, mid-semester examinations, term papers and assignments. The mid-semester examinations are usually held on the 8<sup>th</sup> week of the semester during lecture hours which are normally based on coursework, assignments and classroom tests. Marked mid-

semester examination answer scripts and assignments are returned to students and may be discussed with the Course Instructor. The weight of each of the above component used in the determination of the final grade for each course should be clearly conveyed in writing to the students by the Course Instructor during the first week of the commencement of each course along with the outline of the course.

The final examinations for all courses are held three to five days after classes end. All final examination arrangements are announced by Registry via e-mail and posted on the Registry website.

The Academic Senate will meet at the end of each semester to decide on the performance and the academic standing of each student registered for that year.

### 3.2.2 Grading System

Letter grades based on the grade point system and corresponding description, as illustrated in the table below, will be used to assess the performance of each student in each course.

Percentage	Grade	Value	Grade Definition	
90-100 80-89 75-79	A+ A A-	4.0 4.0 3.7	Excellent	Strong evidence of original thinking; good organization, capacity to analyze and synthesize; superior grasp of subject matter with sound critical evaluation; evidence of extensive knowledge base.
70-74 65-69 60-64	B+ B B-	3.5 3.3 3.0	Good	Grasp the subject matter, some evidence of critical capacity and analytical ability; reasonable understanding of relevant issues; evidence of familiarity with the literature.
55-59 50-54 45-49	C+ C C-	2.7 2.5 2.0	Adequate	Profiting from the academic experience; understanding the subject matter; ability to develop solutions to simple problems in the material.
35-44	D	1.0	Marginal	Some evidence of familiarity with the subject matter and some evidence that critical and analytical skills have been developed.
0-34	F	0.0	Inadequate	Little evidence of even superficial understanding of subject matter; weakness in critical analytical skills, with limited or irrelevant use of literature.
	I		Incomplete	Grade not earned.

Grade **D** or above is required to earn credit for a course.

- a) By repeating only the end-of-semester examination, the grades **D** or **C-** can be improved and considered for calculating the Semester Grade Point Average, An Incomplete '**T**' grade given in any course and reported to Academic Senate will be recorded on the transcript and the new grade given by the Course Instructor recorded on the transcript without deleting the '**T**' grade.

- b) Courses spanning two-semesters, when not completed at the end of two semesters will be given an incomplete 'I' grade. If at the end of the subsequent semester in which the course remains incomplete, the 'I' grade for these courses will be converted to fail 'F'. Since it may not be possible to report the evaluation of these courses to the Academic Senate Review of Students, the grades for the courses should be reported to the regular Academic Senate meetings.
- c) A student receiving an F grade must repeat the entire course.
- d) In the event a student is unable to sit for the end-of-semester examination due to illness or other compelling reason, the student must notify Registry within 48 hours of the cause. Further, the student should make an appeal with supporting documents to the Dean within one week from the date of the examination. The next examination will be considered then as the first attempt. The grade is not counted in the calculation of the Semester Grade Point Average.  
Only the grade achieved for each course will be entered on the student's transcript of records. The grade at the first attempt or the improved grade earned at a subsequent attempt, if any, will be recorded.

### 3.2.3 Grade Point Average (Semester)

The calculation of the Semester Grade Point Average (GPA) will be based on the summation of Grade Points earned for all courses registered for credit in a semester weighted according to number of credits (see the formula below). The Semester Grade Point Average is rounded to the nearest second decimal place. The Semester Grade Point Average is reported on the transcripts and is issued for each semester.

$$GPA = \frac{\sum n_i \times g_i}{\sum n_i}$$

Where  $n_i$  is the number of credits for the  $i^{th}$  course in a given semester and  $g_i$  is the grade points earned for that course.

### 3.2.4 Grade Point Average (Cumulative)

The Cumulative Grade Point Average (CGPA) describes a student's current standing in terms of all courses registered for credits up to given point of time weighted according to the grades assigned to each course and the academic year of the course. The weight for each year will be uniform.

$$CGPA = \frac{\sum n_i \times g_i}{\sum n_i}$$

Where  $n_i$  is the number of credits for the  $i^{th}$  course in a given semester and  $g_i$  is the grade points earned for that course.

### 3.2.5 Honors

Honor classes are determined for students completing all of the graduation requirements within five academic years. The CGPA as indicated below will be used for awarding honor classes:

<b>Final CGPA</b>	<b>Class/Honor</b>
3.60 or above	First Class
3.30 – 3.59	Second Class – Upper Division
2.90 – 3.29	Second Class – Lower Division
2.50 – 2.89	Pass

Under exceptional circumstances, a student who satisfies the CGPA but takes longer than five academic years to complete the course requirements may be deemed eligible for the award of an undergraduate degree with an honor class by the Academic Senate on the recommendation of a faculty member.

## 3.3 Code of Conduct

### 3.3.1 Punctuality

Students are not allowed to access the lecture rooms or laboratories later than 10 minutes after the lecture/lab session commences. Students coming late will be allowed in with a written permission from the Dean or a Senior Lecturer of the Faculty after presenting him/her with a valid explanation for the late arrival. No more than 3 such permits will be issued per semester under any circumstances.

### 3.3.2 Conduct towards Lecturers and General Conduct

Students should be courteous to lecturers at all times. Any discourteous or derogatory vocabulary used against a lecturer or violent behavior displayed will warrant immediate suspension from attending for lectures or practicals/tutorials for a period of 7 working days upon receiving of a complaint. Within that period the student will be notified in writing to appear before a disciplinary committee, headed by the Dean, FoE, comprising of the registrar for a hearing and to determine the course of action which may range from extension of suspended period or dismissal from studentship. However exoneration or relief may possible if found not guilty. The decisions of the disciplinary committee will be final and binding. The time spent during suspension will be considered as absent days and will reflect in final grading of the semester modules. The decisions of the disciplinary committee will be notified to the student and his/her parents in writing. Offences such as damage to campus property, sexual harassment, physical assault of fellow students, academic or non-academic staff members will also carry similar disciplinary action.

### 3.3.3 Dress Code

Male students to wear longs, short or long sleeved/rolled up office wear shirts with covered shoes and female students to wear jeans/pants, blouses and other dresses (acceptably covered) on days when lectures are conducted. No T-Shirts, Revealing

dresses, Sandals, Thongs/Slippers will be permitted at any time within a lecture hall or laboratory. Multi-colored or Tinted hair or fancy hair cuts will not be permitted at any time. If a physical disability compels a student to wear otherwise, he/she will be required to obtain written permission from the Dean of the Faculty or in his absence from a senior lecturer of Faculty of Engineering.

### 3.4 Student Awards

A student who obtains a Semester Grade Point Average of 3.70 or greater in any academic semester (except during inter- semester) will be recommended by the Board of Examiners to be included in the Dean's List and such a placement will also be noted on the student's transcript. In addition to the Semester GPA, participation in extracurricular activities would also be given such consideration.

### 3.5 Repeating a Course Module

- 1) To Assign a grade to a given module, the student should at least fulfill the following requirements;
  - a) Sit for the end semester exam of the module
  - b) Maintain an attendance factor of 0.6 or above for the lectures and Lab sessions of the module

Mid semester exams are to be attempted only once for a given module, unless the student repeats the entire module under the advice of the faculty board. Not sitting for a mid semester exam is not excusable, even on medical grounds, and in the event of a student not sitting for the mid semester exam the final grade will be calculated excluding mid semester marks and the grade thus calculated will be taken for GPA calculations for the semester.

However, upon an appeal by the student, the Faculty Board may, under special circumstances, grant holding of a repeat exam or conducting an equivalent evaluation method in place of the mid-semester exam on a later date. The decision on the above is at the sole discretion of the Faculty Board and may subject to student full filling the following conditions;

- a) Should have maintained an attendance of 80% or above leading to mid semester exam.
- b) Should have obtained more than 3.8 CGPA for previous completed semesters.
- c) Should have submitted all assignments and lab reports on or before due date.
- d) Attended all functions related to the course organized by the faculty.
- e) Paid all dues, tuition fees and others, as stipulated by the faculty.

All repeat mid semester exams or equivalent assessments are charged Rs. 5,000 + taxes per module and should be paid upon registering for such assessment 5 working days within the announcement of exam/ assessment date.

- 2) If a student fails to sit for an end semester exam such a module is considered as incomplete and will be denoted on the transcript as 'I' and will not be counted for GPA calculations.

In the event a student fails to sit for an end semester exam on medical grounds, he (/she) is allowed to sit for the corresponding repeat exam free of charge. However, in such an instance the relevant medical certificate issued by a registered medical practitioner should be submitted to the Faculty Coordinator within 3 working days of the exam date.

In the event of a student obtaining a grade 'I' under the above circumstances, it is at the discretion of the Faculty Board to recommend that the student take the full module with lectures or only the repeat end semester exam. The final decision of the Faculty Board will be taken in consultation with the student academic advisor and the lecturer of the particular module.

- 3) Once the final grades are released, the Examination Board of FoE along with academic advisors and module lecturers will decide whether a student should repeat only the end semester exam or the whole module with the full course of lectures taking in to consideration the following;
  - a) Attendance of students for lectures and lab sessions.
  - b) Marks obtained for assignments and lab course works.
  - c) Marks obtained for any other continuous assessment.

In the event of a student failing both mid and end semester exams, it is imperative the whole module be repeated with lectures and lab sessions.

A student who has failed a particular end semester exam and is wishing to sit for the corresponding repeat exam should register for such within 5 working days of the announcement of the date of repeat exam by paying a registration fee of Rs. 2,500 + taxes per module. Registration fees should be made to the Faculty Coordinator and a receipt obtained.

- 4) In the event of a student repeating only the end semester exam of a particular semester, the final grade will be calculated with the results already obtained previously by the student for the corresponding mid semester exam and for assignments, continuous assessments and lab course works.
- 5) Student is excused for non-attending a lecture session only if supported by a medical certificate issued by a certified medical practitioner submitted to the Faculty Coordinator within 5 working days of being absent.
- 6) Cumulative Grade Point Average (CGPA) is calculated at the end of 4<sup>th</sup> semester for a given batch and only those students who score CGPA of 2.0 or above will be eligible to transfer to AIT for the final phase of the course. However students with CGPA between 2.0 and 2.5 will be placed under probation and will be dismissed at AIT if a CGPA of less than 2.5 is obtained for two consecutive semesters.
- 7) Students who fail to transfer to AIT in the first instance are advised as follows;
  - a) Students who are to repeat only the end semester exam, as directed by the Faculty, can do so at a repeat exam or at the corresponding end semester exams with the subsequent batches by registering for failed or incomplete modules at a fee of Rs.10,000 + taxes per module per attempt from the second attempt onwards. It is not compulsory for the student to attend lectures, but is free to use resources of Campus for study related activities.

- b) Students who are to follow the whole module, including the lectures, as directed by the Faculty can do so with the subsequent batches by registering for failed or incomplete modules at a fee of Rs. 25,000 + taxes per module per attempt. In such an event, student is expected to go through the module completing all assignments, lab sessions and attending to lectures maintaining an attendance factor of 60% or above.
- 8) If a student wish to up- grade his/her final grading from Grade D upwards for a particular module he/she may apply to sit for the corresponding repeat end semester exams by paying a fee of Rs. 15,000 + taxes within 5 days of the announcement of the dates of repeat exam. Final Grades assigned for a given module is based on the marks a student obtains in the last sitting of corresponding end semester exams or repeat end semester exam and only such final grade will be taken into account when calculating the CGPA.

However, the original grade obtained by the student in the first attempt will be printed in the transcript along with the new grading.

### 3.6 Plagiarism

1. As to prevent plagiarism and cheating taking place in exams, the following steps will be taken at the examination halls.
  - a) No mobiles, text books, notes and bags are permitted into the examination hall.
  - b) No material or equipment such as erases, tipex etc should be shared by students.
  - c) For the entire duration of a particular question paper, students will not be permitted to leave the examination hall.
  - d) Any form of aiding and abetting of plagiarism and cheating is strictly prohibited and will be considered as cheating.
  - e) No communication in whatever means is strictly prohibited among candidates whilst the examination is being conducted.
2. If found practicing of above, the following actions will be taken against such students;
  - a) The answer script will be marked zero on the spot and the student will get no marks for this particular paper.
  - b) The student will be required to repeat the entire module including of appearing for full course of lectures and practical.
  - c) The details of the act of plagiarism will be recorded and included in the students personal file and will be reported to AIT.
  - d) The above measures are taken for the first offence and for a repeat offence the student will be summarily dismissed from the course.

### 3.7 Assignments/ Lab Reports

All assignment and course works/lab reports should be hand written and submitted on or before the deadline. Failure to do so and late submissions will result in the student getting no marks (zero) for the assignments. Report formats specified by the relevant department should be strictly followed when submitting assignments and lab reports.

Any of the above submission found to be copied from another student will result in both students getting zero marks.

### 3.8 Attendance Criteria

Students are required to maintain above 80% attendance level in all semesters during the course. If the attendance of a student falls between 60%-80% for any given module in any given semester, the final marks obtained for the relevant module will be multiplied by the corresponding attendance factor and taken for the calculation of final Grade.

Students who get absent due to a medical condition should produce a valid Medical Certificate issued by a registered medical practitioner in order to get consideration to waive-off the above criteria. However, the Dean of the Faculty has the authority to refer such cases to SAITM Medical Center and request the student to undergo a medical examination before accepting the produced Medical Certificate.

Students falling below the 60% attendance level will be considered having failed the module for not completing the stipulated lecture hours, and will be compelled to repeat the particular module with a subsequent batch/intake in order to achieve a Pass Grade.

## 4 Curriculum and Programs

### 4.1 Curriculum

All programs under the Faculty of Engineering are affiliated to Asian Institute of Technology (AIT), Thailand.

AIT (<http://www.ait.ac.th>) is an independent International University set up under the auspicious of the United Nations with the Board of Governors consisting of ambassadors of countries in the region as well as outside the region.

AIT established in 1959 has introduces UG programs (<http://www.ug.ait.ac.th>) in Mechatronics, Electronics, Telecommunication, ICT and Civil and Infrastructure Engineering from 2009.

Hitherto a postgraduate Institute, AIT has earned itself an unenviable reputation as a top notch International university recognized for its producing of world class Engineers

Curriculum with the relevant semester details are as follows.

*Note: The Last two rows of each table shows the sub total credits for that particular semester and total credits covered until that particular semester, respectively.*

Year I Semester I							
CS	IT	ICT	TC	EL	MT	IE	CIE
UG101 Mechanics 4(3-1)							
UG102 Calculus I 3(3-0)							
CS101 Introduction to Computers and Programming 5(3-2)							
UG103 English Communication Skills I 3(2-1)							
UG104 Praxis I 1(0-1)							
UG110 Engineering Drawing 3(1-2)							
<b>16(11-5)</b>	<b>16(11-5)</b>	<b>16(11-5)</b>	<b>19(12-7)</b>	<b>19(12-7)</b>	<b>19(12-7)</b>	<b>19(12-7)</b>	<b>19(12-7)</b>
<b>16(-)</b>	<b>16(-)</b>	<b>16(-)</b>	<b>19(-)</b>	<b>19(-)</b>	<b>19(-)</b>	<b>19(-)</b>	<b>19(-)</b>

Year I Semester II							
CS	IT	ICT	TC	EL	MT	IE	CIE
UG105 Electromagnetism & Optics I 4(3-1)							
UG106 Calculus II 3(3-0)							
UG107 English Communication Skills II 3(2-1)							
UG108 Praxis II 1(0-1)							
CS102 OOP & Web Applications 4(2-2)				UG 109 Chemistry 4(3-1)			
UG111 Engineering Mechanics 3(2-1)							
15(10-5)	15(10-5)	15(10-5)	18(14-4)	18(14-4)	18(14-4)	18(14-4)	18(14-4)
31(-)	31(-)	31(-)	37(-)	37(-)	37(-)	37(-)	37(-)

Year II Semester I							
CS	IT	ICT	TC	EL	MT	IE	CIE
UG201 Linear Algebra 3(3-0)							
UG202 Applied Mathematics Laboratory 1(0-1)							
CS201 Computer Systems Architecture 3(3-0)		EL201 Semiconductor Devices 3(2-1)			CS201 Computer Systems Architecture 3(3-0)	CIE202 Fluid Mechanics 3(2-1)	
EL202 Electrical Circuits 4(3-1)						CIE203 Surveying 3(2-1)	
CS202 Discrete Mathematics 3(3-0)				CS201 Computer Systems Architecture 3(3-0)	IE202 Strength of Materials 3(2-1)		
UG203 Material Science 3(2-1)							
EL203 Digital Logic Design 3(2-1)		TC201 Introduction to Telecommunication 3(3-0)		EL203 Digital Logic Design 3(2-1)	IE201 Introduction to Manufacturing Process 3(2-1)		CIE201 Soil Mechanics 3(2-1)
17(14-3)	17(14-3)	20(16-4)	20(16-4)	20(15-5)	20(15-5)	20(15-5)	19(13-6)
48(-)	48(-)	51(-)	57(-)	57(-)	57(-)	57(-)	56(-)

Year II Semester II							
CS	IT	ICT	TC	EL	MT	IE	CIE
UG204 Probability and Statistics 3(3-0)							
UG205 Calculus III 3(3-0)							
UG206 Foreign Language I 2(2-0)							
EL204 Electronic Circuits 3(2-1)					UG304 Humanities 3(3-0)	CIE205 Structural Analysis I 3(3-0)	
CS203 Operating Systems 3(3-0)		TC202 Signals and Systems 3(2-1)			IE203 Operations Research I 3(3-0)	CIE206 Hydrology 3(3-0)	
CS204 Data Structure and Algorithms 3(3-0)		UG207 Electromagnetism and Optics II 3(2-1)			MT201 CAD/CAM 3(1-2)		CIE204 Foundation Engineering 3(2-1)
17(16-1)	17(16-1)	17(14-3)	17(14-3)	17(14-3)	17(13-4)	17(14-3)	17(16-1)
65(-)	65(-)	8(-)	74(-)	74(-)	74(-)	74(-)	73(-)

Inter-Semester Year II & III							
CS	IT	ICT	TC	EL	MT	IE	CIE
Internship I (12 Weeks) 3(0-3)							
3(0-3)	3(0-3)	3(0-3)	3(0-3)	3(0-3)	3(0-3)	3(0-3)	3(0-3)
68(-)	68(-)	71(-)	77(-)	77(-)	77(-)	77(-)	76(-)

Year III Semester I							
CS	IT	ICT	TC	EL	MT	IE	CIE
UG301 Foreign Language II 2(2-0)							
UG302 Engineering Economics 3(3-0)							
CS301 Theory of Computation 3(3-0)		TC301 Telecommunication Systems 3(2-1)		EL301 Electrical Instruments and Measurement 3(2-1)	MT301 Mechanical Vibration 3(3-0)	IE301 Safety Engineering 3(3-0)	CIE301 Structural Analysis II 3(3-0)
Technical Elective I 3(-)	IT301 Computer Networks 3(3-0)	CS201 Computer Systems Architecture 3(3-0)		EL302 Semiconductor or Fabrication 3(3-0)	MT302 Mechanics of Machinery 3(2-1)	IE302 Production Planning and Control 3(3-0)	CIE302 Numerical Methods 3(3-0)
CS303 Logic in Computer Science 3(3-0)		Technical Elective I 3(-)	TC302 Digital Signal Processing 3(2-1)	EL303 Advanced Electronics Circuit 3(2-1)	MT303 Mechanical Design 3(2-1)	IE303 Industrial Work Study 3(3-0)	CIE303 Hydraulics Design 3(3-0)
Technical Elective II 3(-)	IT302 Human-Computer Interaction 3(3-0)	Technical Elective II 3(-)	TC303 Antenna and Propagation 3(2-1)	EL304 Power Electronics 3(3-0)	CIE202 Fluid Mechanics 3(2-1)	IE304 Maintenance Engineering 3(3-0)	CIE304 Introduction to Transportation Engineering 3(3-0)
17(-)	17(17-0)	17(-)	17(14-3)	17(15-2)	17(14-3)	17(17-0)	17(17-0)
85(-)	85(-)	88(-)	94(-)	94(-)	94(-)	94(-)	93(-)

Year III Semester II							
CS	IT	ICT	TC	EL	MT	IE	CIE
UG303 Environmental Studies 3(3-0)							
UG305 Technical Writing 3(3-0)							
UG304 Humanities 3(3-0)						Technical Elective I	UG304 Humanities 3(3-0)
CS305 Programming Languages and Compilers 3(3-0)		TC304 Communication Engineering 3(2-1)			MT305 Automatic Control 3(2-1)	IE305 Quality Control 3(3-0)	CIE305 Design of Reinforced Concrete Structures 3(3-0)
CS304 Advanced Algorithms 3(3-0)		TC305 Data Communications and Networks 3(2-1)			MT306 Electromechanical Machine Design 3(2-1)	IE306 Industrial Plant Design 3(3-0)	CIE306 Highway Engineering 3(3-0)
Technical Elective III 3(-)	IT303 Object Oriented Analysis and Design	Technical Elective III 3(-)	MT305 Automatic Control 3(3-0)	MT304 Industrial Control Systems 3(3-0)			CIE307 Project Scheduling in Construction 3(3-0)
18(-)	18(18-0)	18(-)	18(16-2)	18(16-2)	18(-)	18(18-0)	18(18-0)
103(-)	103(-)	106(-)	112(-)	112(-)	112(-)	112(-)	111(-)

Inter-Semester Year III & IV							
CS	IT	ICT	TC	EL	MT	IE	CIE
Internship II (12 Weeks) 3(0-3)							
3(0-3)	3(0-3)	3(0-3)	3(0-3)	3(0-3)	3(0-3)	3(0-3)	3(0-3)
106(-)	106(-)	109(-)	115(-)	115(-)	115(-)	115(-)	114(-)

Year IV Semester I							
CS	IT	ICT	TC	EL	MT	IE	CIE
UG401 Capstone Project I 5(-)							
UG402 Principles of Innovation and Entrepreneurship 2(2-0)							
Technical Elective IV 3(-)	IT401 Internet Technology 3(3-0)	Technical Elective IV 3(-)	TC401 Digital Communications 3(2-1)		Technical Elective I 3(-)	Technical Elective II 3(-)	Technical Elective I 3(-)
EL402 Embedded Systems 3(2-1)		Technical Elective V 3(-)	TC402 Optical Communications 3(2-1)	EL402 Embedded Systems 3(2-1)	Technical Elective II 3(-)	Technical Elective III 3(-)	Technical Elective II 3(-)
Technical Elective V 3(-)	IT402 Database Design 3(3-0)	Technical Elective VI 3(-)	TC403 Teletraffic Engineering 3(2-1)	Technical Elective I 3(-)	Technical Elective III 3(-)	Technical Elective IV 3(-)	Technical Elective III 3(-)
Technical Elective VI 3(-)	IT403 Software Architecture Design 3(3-0)						
19(-)	19(-)	16(-)	16(-)	16(-)	16(-)	16(-)	16(-)
125(-)	125(-)	125(-)	131(-)	131(-)	131(-)	131(-)	130(-)

Year IV Semester II							
CS	IT	ICT	TC	EL	MT	IE	CIE
UG403 Capstone Project II 5(-)							
Technical Elective VII 3(-)	IT405 Web Application Engineering 3(1-2)	UG404 Engineering Professional Practice 2(2-0)					
Technical Elective VIII 3(-)	Technical Elective II 3(-)	Technical Elective VIII 3(-)	Technical Elective I 3(-)	EL401 Analog Integrated Circuits 3(3-0)	Technical Elective IV 3(3-0)	Technical Elective V 3(3-0)	Technical Elective IV 3(3-0)
Technical Elective IX 3(-)	Technical Elective III 3(-)	Technical Elective IX 3(-)	Technical Elective II 3(-)	Technical Elective II 3(-)	Technical Elective V 3(3-0)	Technical Elective VI 3(3-0)	Technical Elective V 3(3-0)
Technical Elective X 3(-)	IT404 Information Systems Development 3(2-1)	Technical Elective VII 3(-)	TC404 Wireless and Mobile Communications 3(2-1)	Technical Elective III 3(-)	Technical Elective VI 3(3-0)	Technical Elective VII 3(3-0)	Technical Elective VI 3(3-0)
17(-)	17(-)	16(-)	16(-)	16(-)	16(-)	16(-)	16(-)
142(-)	142(-)	141(-)	147(-)	147(-)	147(-)	147(-)	146(-)

#### 4.1.1 B.Sc. Eng in Mechatronics/ Electronics/ ICT/ Telecommunication

##### *Program Objectives/ Description*

<b>Course/ Subject Title</b>	<b>Description</b>
Calculus I	Functions & graphs, Limits and continuity, Derivatives, Rules of differentiation, Higher order derivatives, Mean Value Theorem, L'Hospital's Rule, Integrals, Fundamental Theorem, Techniques of integration, Definite integrals. Applications of differentiation and integration, Basic Differential equations, parametric equations, Polar Coordinates, Infinite sequence and series
Introduction to Computer and Programming	Objects and classes; fundamental data types; control structures; arrays; inheritance, interfaces, and polymorphism; I/O and string processing; Exceptions; searching and sorting
Mechanics	Review of dimensions and measurements, concepts in dynamic mechanical systems displacement, velocity and acceleration, Introduction to vectors, two dimensional motion, Concept of force, Newton's laws on force and applications, Centre of gravity, Static systems with distributed loads, Angular motion, Numerical Modeling in dynamics, Kinetic and potential energy.
Electrical Circuits	Circuit elements and Kirchoff's Law, Analysis of resistive circuits, Network theorems, Alternating Current theory, Three-Phase Circuits, Electrical measurements. Non sinusoidal wave forms, Electrical Installations
Praxis I	Design principles, Creativity and reasoning, Analysis and synthesis, Decision making, Simple but comprehensive design case studies, mechanical, material, electrical, electronic and IT aspects in design, Group based design, Preparing work plans and delegating duties, Deadlines and costs constraints, Basic procedures in conceptual, preliminary and detailed designs, Report and presentation
Calculus II	Vectors and the Geometry of Space, vector functions, functions of several variables, partial differentiation, Multiple Integration, vector analysis and higher order differential equations.
Electromagnetism and optics I	Elements of electromagnetism, Electromagnetic theory and applications, A.C. Circuits, R, L, C circuits, Introduction to optics, Lenses and optical instruments, Applications of optics and LASER, Basic electrical measurements
Material Science	Atomic structure, Crystal geometry and structure, Crystal Imperfections, Surface imperfections, Fundamentals of diffusion in solids, Phase transformations in materials, Metals and Ceramics, Electrical, Magnetic and Optical properties of materials
Object Oriented Programming and Web Application	Data structures and algorithms, recursion, graphical user interfaces, multithreading, streams, sockets, databases, and web applications.
Semi Conductor devices	Semiconductor fundamentals, Operation and applications of analog and digital electronics devices, Diode, Diode circuits and applications, Bipolar junction transistors (BJTs), BJT circuits and applications, Field effect transistors (FETs), FET circuits and applications, Logic gates, Introduction to sequential and combinational logic circuits, Semiconductor device fabrication
Praxis II	Software tools for engineering design, equipment used for manufacturing, documentation and reporting

Computer Systems Architecture	Data representations. Computer arithmetic. Floating point representations. Intel 32-bit instruction set architecture. MIPS instruction set architecture. Logic design. Processor architecture. Program optimization. The memory hierarchy.
Discrete Mathematics	Basic logic, mathematical reasoning, proof techniques, sets, functions, relations, counting, discrete probability, graphs, trees.
Electronics Circuits	Review on Diode, Transistor Circuits, Differential Amplifiers, Operational Amplifiers, Power Electronic Devices, Logic Circuits, Combinational Circuits, and Sequential Circuits, Other Devices (PLAs, RAM, ROM, and microcontrollers).
Introduction to Manufacturing Processes	Materials for Design and Manufacturing, Methods of manufacturing, Machining Processes, Joining Processes, Finishing processes, Inspection and quality control, Manufacturing Systems.
Introduction to Telecommunication	Standardization, Conventional telephony, Signaling to the Exchange from the telephone, Telephone numbering, Switching and Signaling, Local-Access Networks, International Networks, Network Management, Traffic Engineering, Simplex, Half-duplex, and Full-Duplex communication, Frequency and Bandwidth, Analog and digital signal and systems, Analog signals over digital networks, PCM, Other speech-coding methods, Power levels of signals and decibels, Basic concepts of transmission systems, Radio transmission, Data rate of a transmission channel, Coding, Regeneration, Multiplexing, transmission media, Transmission equipment in the network, Cellular radio principles, Structure of a cellular networks, Operating principles of a cellular network, Mobile communication systems, GSM, Operation of the GSM network, GPRS, Data communication, Physical devices and networks, Protocols, Networks, Applications
Linear Algebra	System of Linear Equations, Linear Transformation and Matrix, Vector Space, Linear Transformation, Linear Independence, Basis, Determinants, Eigen value and Eigenvector, Inner Product, Orthogonality
CAD/ CAM	Solid modeling of component using Solid works/AutoCAD, Generation of complex shapes, Assembly modeling, Obtaining Mechanical Drawing, Component analysis ( by FEM using available software), Data exchange, CNC machining and CAD/CAM interfacing.
Applied Mathematics Laboratory	Basic programming concepts including: algorithm development, data types, number representation, control structures, functions, plotting and basic numerical analysis techniques. The basic numerical analysis techniques covered in the course include matrix operations, systems of equations, solving equations, roots, curve fitting, interpolation, numerical integration and ordinary differential equations.
English Communication Skills I	Communication models and analysis. Engineering communication. Ethics in professional life and communication. Oral presentation. Writing as a process. Visual elements in oral and written communication. Group work and collaborative writing.
Calculus III	Partial Differential Equations. Numerical Methods. Special Functions: Gamma, Beta, Bessel, Legendre. Fourier Series and Fourier Integrals. Laplace Transforms. Complex Analysis.
Basic Kinematics and Dynamics	Review of particle mechanics. Different coordinate representations, Mechanics of rigid bodies
Probability and Statistics	Sample Space and Events, Axioms of Probability, Conditional Probability, Discrete and Continuous Random Variables, Probability Distributions, Mathematical Expectation, Special Distributions, Joint Probability Distributions, Random Samples. Estimation Theory, Testing of Hypotheses, Statistical Inferences, Linear Regression and Correlation,

	Analysis of Variance
Electromagnetism and Optics II	Stationary Electric Fields, Stationary Magnetic Field, Maxwell's Equations, The Electromagnetic of Circuits, Transmission Lines, Plane-Wave Propagation and Reflection, Two- and Three-Dimensional Boundary Value Problems
Signals and Systems	Signal models, Energy and power signals, System classification, Time domain analysis of continuous-time systems, Convolution integral, Impulse response of fixed linear systems, Frequency domain analysis of continuous-time systems, Fourier series, Fourier transforms properties and applications, Laplace Transform, Frequency response of linear systems, Stability analysis of LTI systems, Filters, approximations and design. Properties of ideal filters, Butterworth and Chebyshev filters, Fourier analysis of sampled signals.
English Communication Skills II	Communication strategies. Common documents in engineering communication. Ethics in professional life and communication. Oral presentation. Writing as a process: The extended essay/ research paper. Seminar participation. Visual elements in oral and written communication; web content and multimedia presentations. Group work and collaborative writing.

#### 4.1.2 B.Sc. Eng in Civil and Infrastructure

##### *Program Objectives/ Description*

<b>Course/ Subject Title</b>	<b>Description</b>
Mechanics	Review of dimensions and measurements, concepts in dynamic mechanical systems displacement, velocity and acceleration, Introduction to vectors, two dimensional motion, Concept of force, Newton's laws on force and applications, Centre of gravity, Static systems with distributed loads, Angular motion, Numerical Molding in dynamics, Kinetic and potential energy.
Calculus I	Functions & graphs, Limits and continuity, Derivatives, Rules of Differentiation, Higher order derivatives, Mean Value Theorem, L'Hospital's Rule, Integrals, Fundamental Theorem, Techniques of integration, Definite integrals. Applications of differentiation and integration, Basic Differential equations, parametric equations, Polar Coordinates, Infinite sequence and series
Introduction to Computer and Programming	Objects and classes; fundamental data types; control structures; arrays; inheritance, interfaces, and polymorphism; I/O and string processing; Exceptions; searching and sorting
Engineering Drawing	Introduction to basic principle of engineering drawing including lettering, applied geometry, orthographic drawing and sketching, sectional views and conventions, detail drawing, assembly drawing, dimensioning; basic descriptive geometry dealing with points, lines & planes and their relationship in space and basic developed views.
English Communication Skills I	Communication models and analysis. Engineering communication. Ethics in professional life and communication. Oral presentation. Writing as a process. Visual elements in oral and written communication. Group work and collaborative writing.
Praxis I	Design principles, Creativity and reasoning, Analysis and synthesis, Decision making, Simple but comprehensive design case studies, mechanical, material, electrical, electronic and IT aspects in design, Group based design, Preparing work plans and delegating duties,

	Deadlines and costs constraints, Basic procedures in conceptual, preliminary and detailed designs, Report and presentation
Electromagnetism and Optics I	Elements of waves, Thermodynamics, Introduction to optics, Lenses and optical instruments, Applications of optics and LASER, Modern physics
Calculus II	Vectors and the Geometry of Space, vector functions, functions of several variables, partial differentiation, Multiple Integration, vector analysis and higher order differential equations.
Engineering Mechanics	Introduction; Forces and Force Systems; Equilibrium of Rigid Bodies; Center of Gravity, Center of Mass, and Centroid; Kinematics of a Particle; Kinetics of a Particles; Kinematics of a Rigid Body; Planar Kinetics of a Rigid Body; Energy and Momentum in Rigid Body Dynamics.
Chemistry	Review of atomic structure and bonding; Gases, Liquid and Solids; Metals and non-Metals; Precipitation and Corrosion; Chemical Thermodynamics; Ionic Equilibrium; Grignard's Reagent; Organic Compounds
English Communication Skills II	Communication strategies. Common documents in engineering communication. Ethics in professional life and communication. Oral presentation. Writing as a process: The extended essay/ research paper. Seminar participation. Visual elements in oral and written communication; web content and multimedia presentations. Group work and Collaborative writing.
Praxis II	Software tools for engineering design, equipment used for manufacturing, documentation and reporting
Linear Algebra	System of Linear Equations, Linear Transformation and Matrix, Vector Space, Linear Transformation, Linear Independence, Basis, Determinants, Eigen value and Eigenvector, Inner Product, Orthogonality
Applied Mathematics Laboratory	Basic programming concepts including: algorithm development, data types, number representation, control structures, functions, plotting and basic numerical analysis techniques. The basic numerical analysis techniques covered in the course include matrix operations, systems of equations, solving equations, roots, curve fitting, interpolation, numerical integration and ordinary differential equations.
Fluid Mechanics	Fluid properties; Hydrostatics; Fluid Kinematics; Conservation of Mass; Momentum and Energy; Flow in Open Channels; Pipe Flow; Turbo machinery; Fluid Measurements; and Similitude and Dimensional Analysis.
Soil Mechanics	Origin and definition of soil; physical properties of soil; engineering soil classification; soil compaction; flow of water in soil; stresses within soil mass; shear strength; soil compressibility; consolidation and settlement.
Strength of Materials	Introduction; Bar under Axial Loading; Torsion of a Shaft; Bending of Beam; Transformation of Stress and Strain; Deflection of Beams; Energy Methods; Buckling of Compressed Member.
Surveying	Ability to use the chain, tape, level, theodolite and other surveying Equipment to carry out field surveys, produce relevant maps and drawings, and do associated computations required for engineering applications.
Material Science	Atomic structure, Crystal geometry and structure, Crystal Imperfections, Surface imperfections, Fundamentals of diffusion in solids, Phase transformations in materials, Metals and Ceramics, Electrical, Magnetic and Optical properties of materials

Calculus III	Partial Differential Equations. Numerical Methods. Special Functions: Gamma, Beta, Bessel, Legendre. Fourier Series and Fourier Integrals. Laplace Transforms. Complex Analysis.
Probability and Statistics	Sample Space and Events, Axioms of Probability, Conditional Probability, Discrete and Continuous Random Variables, Probability Distributions, Mathematical Expectation, Special Distributions, Joint Probability Distributions, Random Samples. Estimation Theory, Testing of Hypotheses, Statistical Inferences, Linear Regression and Correlation, Analysis of Variance
Foundation Engineering	Application of soil mechanics principles to solve civil engineering problems; soil investigation for foundation design; design of shallow and deep foundation; consolidation and settlement analyses; earth and earth retaining structures; stability of earth slopes.
Structural Analysis I	Introduction to modeling concept for structural analysis; Truss systems; Cable and Arch Structures; Beams and Frame Structures; Analysis of Statically Determinate Structures under Moving Loads; Deflections; Energy Methods for Calculation of Deflections; Approximation Analysis of Statically Indeterminate Structures.
Hydrology	Components of hydrologic cycle: rainfall, infiltration and surface runoff; hydrologic transport; statistical methods in hydrology: frequency analysis; hydrologic data collection; forecasting and flood analysis.
Foreign Language Level I	Basic level of: Reading Comprehension; Written Expression and Interaction; Listening Comprehension; Oral Expression and Interaction

## **5 Facilities Offered by the Faculty**

### **5.1 At SAITM**

#### **5.1.1 Engineering Laboratories**

##### ***5.1.1.1 Civil and Infrastructure Engineering***

All required practical, demonstration sessions are carried out as per the AIT standards at department of Civil and Infrastructure Engineering for the following modules,

- Structural analysis
- Fluid mechanics
- Soil mechanics
- Site surveying

##### ***5.1.1.2 Mechatronics Engineering***

All relevant practical, demonstration sessions are carried out as specified by AIT, at the department of Mechatronics Engineering for the following modules,

- Mechanics
- Electromagnetism and optics I
- Semiconductor devices
- Electrical circuits
- Electronics circuits
- Electromagnetism and optics II

##### ***5.1.1.3 Computer Laboratories***

Two high end computer laboratories are available and hands on practical sessions are conducted for the following modules,

- Introduction to computers and programming
- OOP and web applications
- Applied mathematics laboratory
- Computer systems architecture

##### ***5.1.1.4 Engineering Drawing Laboratory***

Fully comprehensive hands on practical sessions are carried out for engineering drawing module at drawing laboratories and computer laboratories.

#### **5.1.2 Lecture Halls**

Fully equipped air-conditioned lecture halls are available for all the lectures.

#### **5.1.3 Recreation and Other Facilities**

Facilities are provided at SAITM for a range of indoor and outdoor activities.

## 5.2 At AIT

50 year matured AIT main campus located in Thailand provides following facilities for the students in their third and fourth years of studies there,

- Fully equipped laboratories for the areas of Mechatronics and Civil and Infrastructure Engineering
- All the relevant lab practical sessions will be carried out in house
- Computer laboratories with all relevant software installed
- University wide internet coverage, all the academic areas are covered with high speed Wi-Fi connectivity
- Fully equipped air conditioned lecture halls/ laboratories
- Facilities for many sports like Cricket, Football, Basketball, Tennis, Swimming, Volleyball etc.