

2021

College of Applied Industrial  
Technology (CAIT)



**Study Plan of  
Mechanical Maintenance  
Engineering Technology  
(MMET) Program**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

## 1. Introduction to College of Applied Industrial Technology (CAIT)

With the approval of the Custodian of the Two Holy Mosques, the Chairman of the Council of Education, may God protect him, College of Applied Industrial Technology was established with government support. We aim to educate our youth in order to support our national economy. The college is located in the Governorate of Baish, where approximately 100 billion riyals is being invested in Jazan Economic City (JEC). JEC contains several industrial mills, such as refineries, Solb Steel plant, and Crystal factory for Titanium. The main goal of the college is to serve the industrial sector by providing highly trained Saudi youth, qualified through programs operating with international providers, to ensure quality and competitiveness.

## 2. CAIT Vision

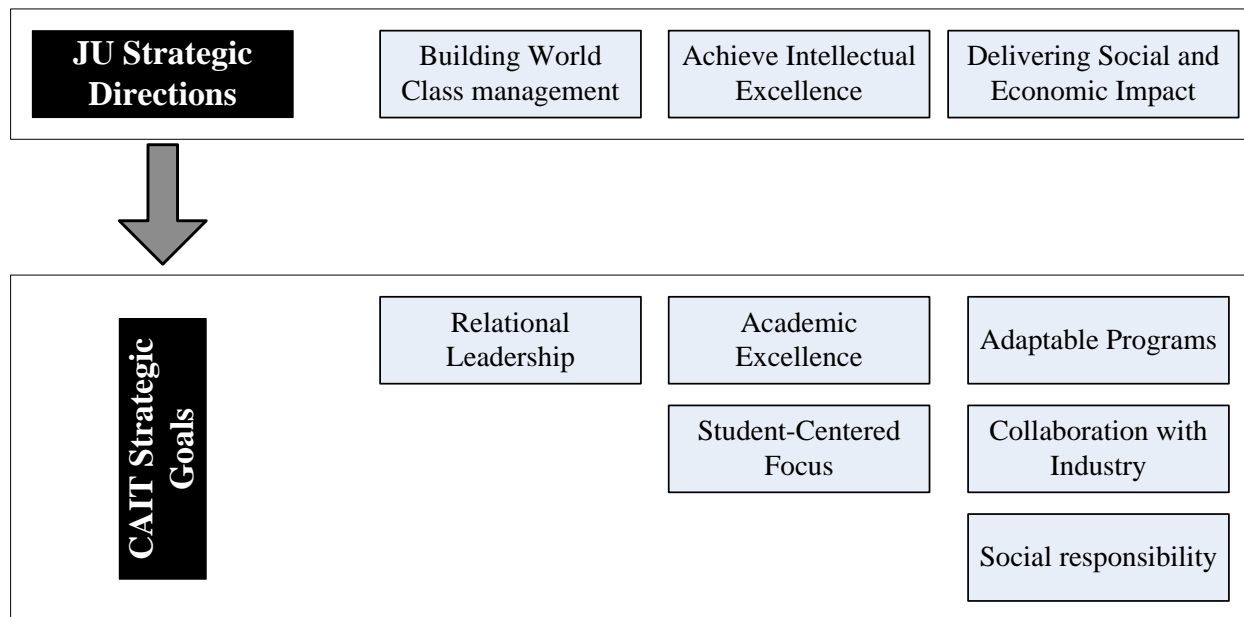
Be a distinct learning center in technical sciences in the Kingdom.

## 3. CAIT Mission

To service the industrial needs of Jazan and the Kingdom of Saudi Arabia with well-qualified technicians, through the provision of high-quality technical programs and strategic partnerships.

## 4. CAIT Strategic Goals

- 1- Relational Leadership
- 2- Academic Excellence
- 3- . Student-Centered Focus
- 4- Adaptable Programs
- 5- Collaboration with Industry
- 6- Social Responsibility



**Figure – 1 CAIT Strategic Goals as driven from JU Strategic Directions**

## 5. CAIT Objectives

1. Equip the students with the necessary skills and technical knowledge to work with a high degree of professionalism.
2. Imbue in the students a scientific approach to critical thinking, better cooperation in teamwork, and good communication with peers and others.
3. Enable students to apply academic knowledge to solve technical problems in their areas of specialization.
4. Inspire confidence in the students, and encourage a sense of social responsibility, good behavior, moral values, and professionalism.
5. Prepare students who have the ability to develop and to continue in their education.
6. Achieve an integrated educational system and set up multiple paths of academic programs, which respond to national needs and to the local labor market.

## 6. The Academic Departments in CAIT

College of Applied Industrial Technology (CAIT) consists of three departments. They are:

- 1- Department of Chemical Engineering Technology
  - (Chemical Engineering Technology Program)
- 2- Department of Electrical Engineering Technology
  - (Electrical Power Engineering Technology Program)
- 3- Department of Mechanical Engineering Technology
  - (Mechanical Maintenance Engineering Technology Program)

These programs have been designed in line with the standards of global technical engineering education, for the sake of the objectives of the Kingdom's development, taking into account the basics of accreditation by the National Commission for Academic Accreditation and Assessment (NCAAA) and the Accreditation Board for Engineering and Technology (ABET).

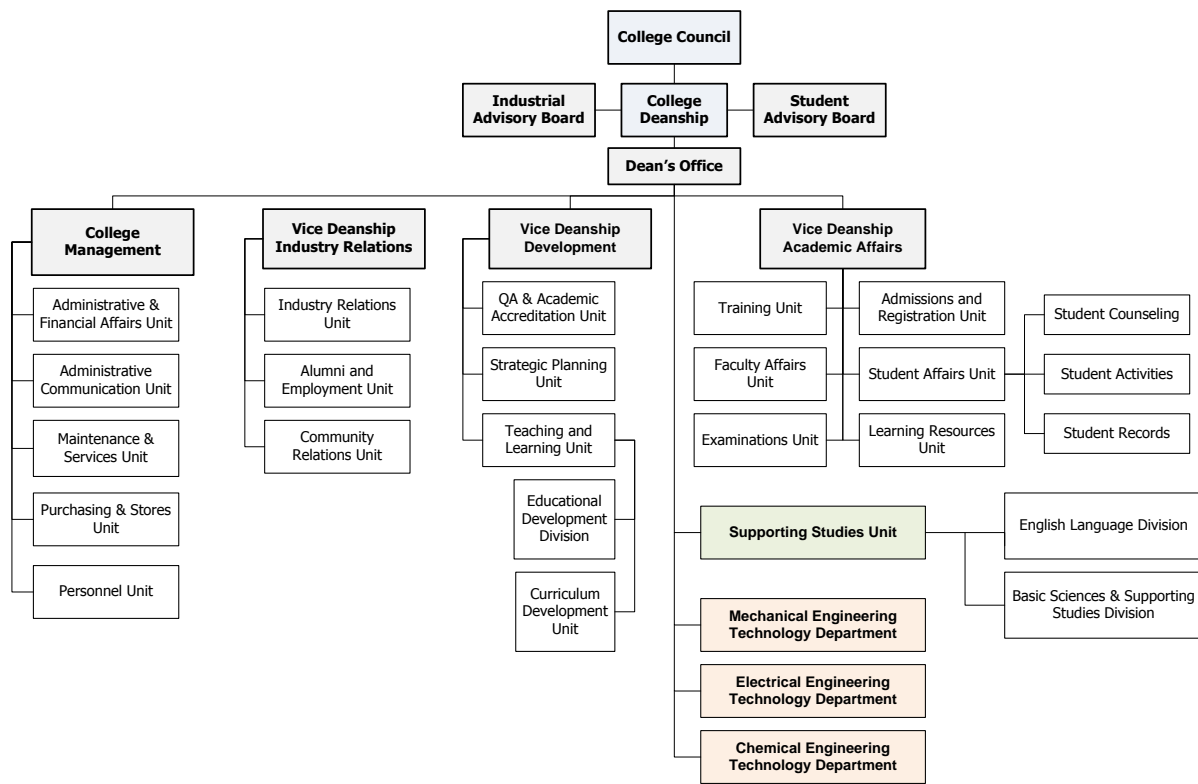


Figure – 2 Organizational framework of CAIT



## 7. The Scientific Degree Awarded

The college awards the degree of *Graduate Diploma (GD)* in the field of specialization.

## 8. Duration of Study

The duration of study in CAIT is three (3) years, all in the **English language**. They are the preparatory, freshman, and sophomore years. Co-operative training is compulsory in the summer semester of the freshman year for eight (8) weeks. During the preparatory year, students mainly study English language, in addition to some basic mathematics and science. The other two years, freshman and sophomore, are allocated mainly to the specialized courses, which depends upon the department requirements, as well as some courses of humanities.

## 9. Admission Requirements

- 1- The student should have Saudi nationality. In case of the non-Saudi student, their mother should carry Saudi nationality.
- 2- The students must be graduated from high school (Science Section).
- 3- The students should not have been graduated for more than two years before admission.
- 4- The student may not have been dismissed from the university or another university for disciplinary reasons.
- 5- Admission is allowed in the case of high-school grade average not less than 60%.
- 6- The students should pass any other requirements which may be set by the college.
- 7- In coordination with the Admission and Registration Deanship, the college has the right to transfer any student to another college, in case if GPA less than 3.0 in his first preparatory year, according to the availability of the university tuition. A pledge is taken by the student regarding this action.
- 8- Students are distributed to departments after the preparatory year, according to their desire, their GPA, and available seats.

## 10. Coding and Numbering

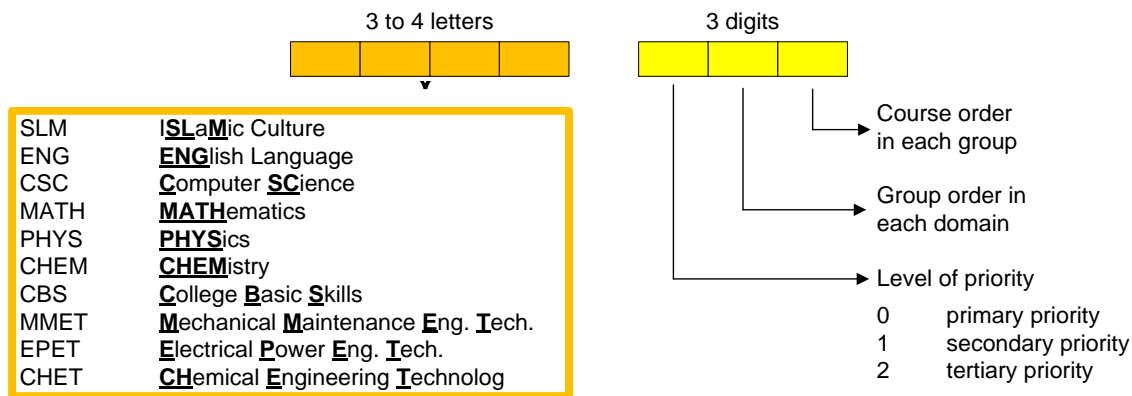


Figure – 3 Coding and numbering system

## 11. Department of Mechanical Engineering Technology

The department was established in 2016 to achieve the vision and mission of the College. It plays an important role in the oil and heavy industries in Saudi Arabia. The objectives of the department are also consistent with the overall objectives of the college in terms of:

1. Equip the students with the necessary skills and technical knowledge to work with a high degree of professionalism in the field of mechanical engineering technology.
2. Imbue in the students a scientific approach to critical thinking, better cooperation in teamwork, and good communication with peers and others.
3. Enable students to apply academic knowledge to solve technical problems in the area of mechanical engineering technology.
4. Inspire confidence in the students, and encourage a sense of social responsibility, good behavior, moral values, and professionalism.
5. Prepare students who have the ability to develop and to continue in their education.
6. Achieve an integrated educational system and set up multiple paths of academic programs, which respond to national needs and to the local labor market. In this regard, the department offers a unique program:

- Mechanical Maintenance Engineering Technology (MMET) Program

### 11.1. Vision of the department

National leadership in the field of technical education in Mechanical Engineering.

### 11.2. Mission of the department

To service the industrial needs of Jazan and the Kingdom of Saudi Arabia with well-qualified Mechanical Engineering Technology graduates, through the provision of high-quality technical programs and strategic partnerships.

### 11.3. Organizational framework of the department

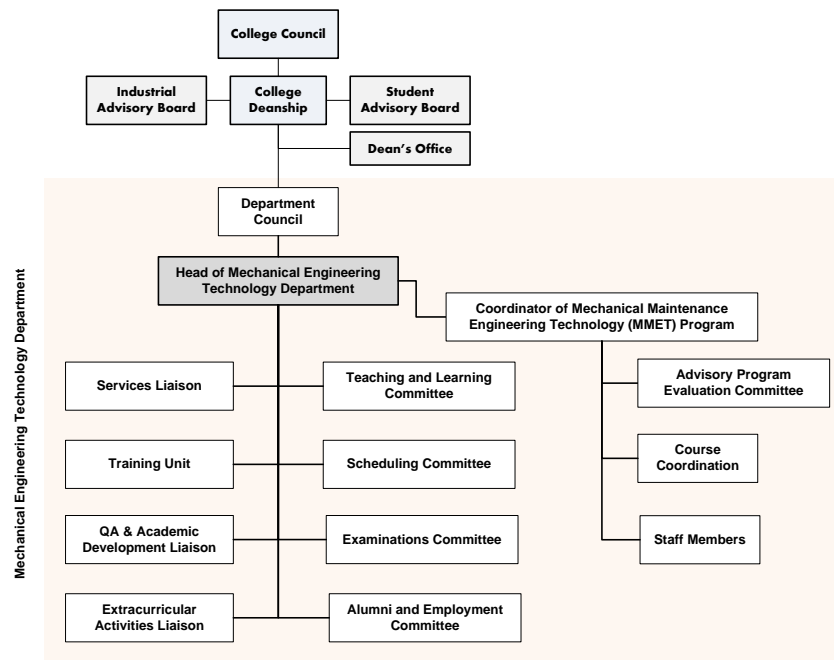


Figure – 4 Organizational framework of the department

## 12. Mechanical Maintenance Engineering Technology Program (MMET)

### 12.1. Introduction

Mechanical maintenance engineering technology plays an important role in heavy and oil industries in the Kingdom of Saudi Arabia. Therefore, the Mechanical Maintenance Engineering Technology (MMET) program is carefully designed to provide a distinct technology curriculum that responds to the needs of these industries.

The Mechanical Maintenance Engineering Technology (MMET) program falls under the Department of Mechanical Engineering Technology. This department plays an important role in the oil and heavy industries in Saudi Arabia. Therefore, the MMET program had been established to serve these industries.

## 12.2. Fields of Work

The mechanical maintenance engineering technology (MMET) program aims the following areas of specialization:

- 1- Maintenance of the equipments of the petroleum industries.
- 2- Maintenance of the equipments of heavy industries.
- 3- Maintenance of the equipments of the food industry.
- 4- Maintenance of the machinery of workshops, factories, and companies.

## 12.3. Vision of MMET program

The vision of the program is in-line with the College's vision of being a distinct program in mechanical maintenance engineering technology in the Kingdom.

## 12.4. Mission of MMET program

The mission of the program is in-line with the mission of both college and department in a sense of: “To prepare well-qualified technicians for immediate employment in the field of Mechanical Maintenance Engineering Technology, through the provision of high-quality technical programs and strategic partnership”.

## 12.5. Goals of MMET program

Goals of MMET program has been selected to match with the college strategic goals, as follows:

- 1- To provide process-oriented purposeful leadership.
- 2- To prepare qualified graduates who are valued as members of the workforce in MMET–related industries.

- 3- To provide an academic environment that stimulates excellence through student focused strategies.
- 4- To collaborate with industry and the community to cater to their needs and the needs of the program's students.

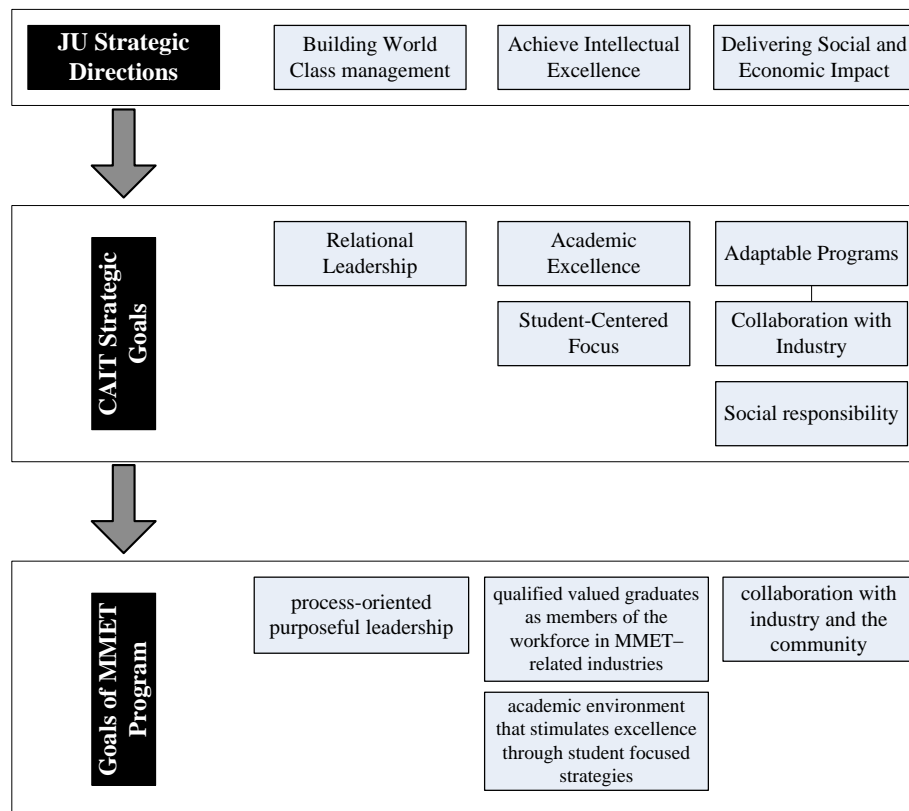


Figure – 5 Goals of MMET program as extracted from CAIT Strategic Goals

## 12.6. Program Educational objectives (PEO) of MMET program

- 1- Graduates will meet employers' expectation in Mechanical Maintenance by undertake active roles in the development of their technical community and ensure promotion in their professional positions and community.
- 2- Graduates will acquire development in their profession, by continuous and life-long learning activities, in order to address contemporary issues in mechanical maintenance engineering technology, in ethical and professional manner.

- 3- Graduates will communicate effectively and work independently or in diverse teams with ethical responsibility and respect of diversity.

## 12.7. Program Learning Outcomes (PLOs) of MMET program

The program learning outcomes (PLOs) may be listed according to the Accreditation Board for Engineering and Technology (ABET) and the National Quality Framework (NQF) as:

### a. Knowledge

- 1- An ability to demonstrate a broad and coherent body of knowledge, with depth in the underlying principles and concepts in the discipline,

### b. Skills

- 2- An ability to apply knowledge, techniques, skills, and modern tools of mathematics, science, engineering, and technology to solve well-defined engineering problems appropriate to the discipline,
- 3- An ability to design solutions for well-defined technical problems and assist with the engineering design of systems, components, or processes appropriate to the discipline,
- 4- An ability to apply written, oral, and graphical communication in well-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature,
- 5- An ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results,

### c. Values

- 6- An ability to function effectively as a member of a technical team, a commitment to quality, timeliness, and continuous improvement, and
- 7- An ability to engage in self-directed continuing professional development.

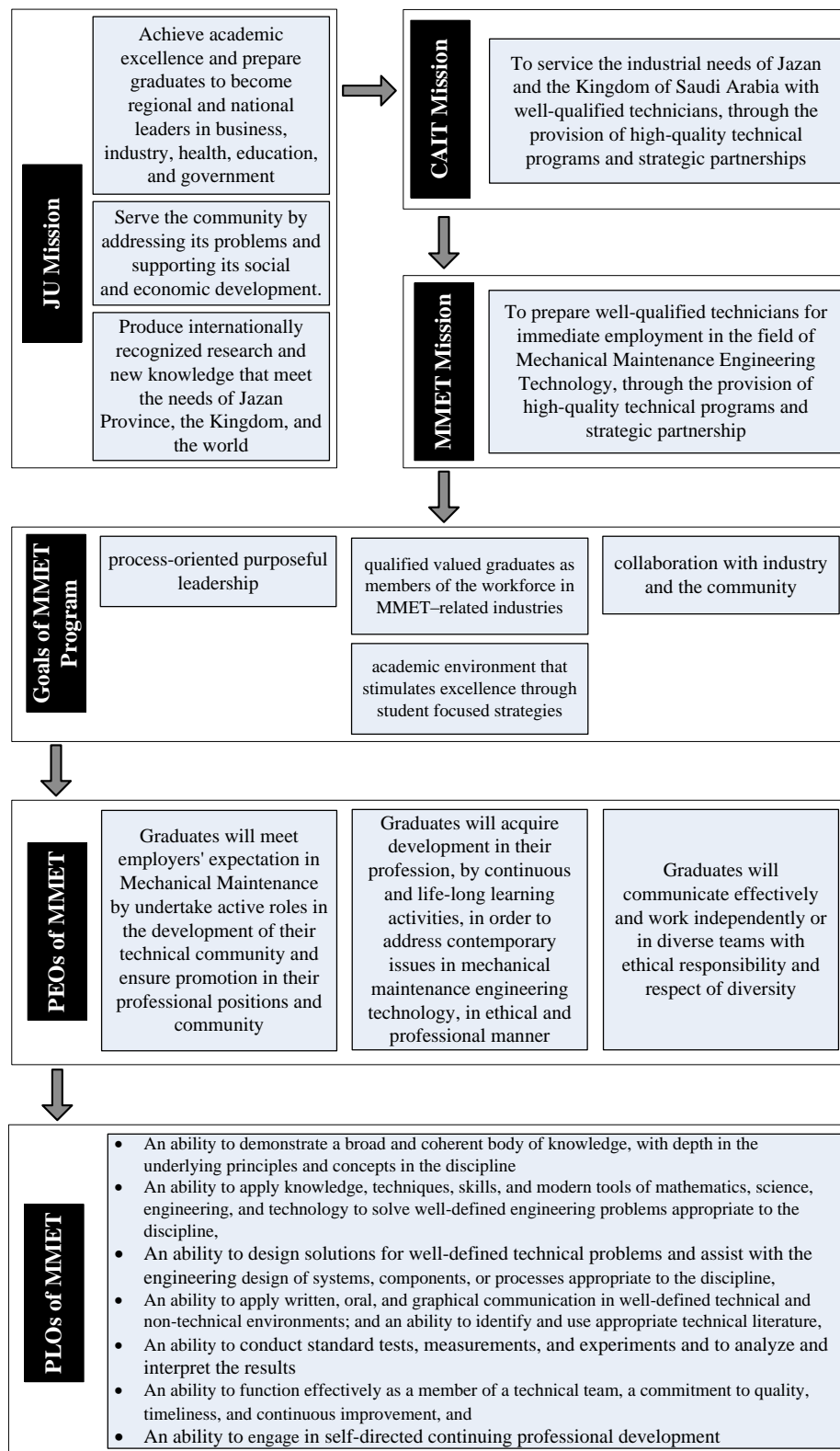


Figure – 6 Mission, Goals, PEOs, and PLOs of MMET program as extracted from CAIT and JU Mission

## 12.8. Program requirements

Table (1) represents the distribution of credit units for the Mechanical Maintenance Engineering Technology (MMET) program among university, college, and department.

**Table (1):** University, college, and department requirements for the AS degree

Requirement	Credit units
University	2
College	54
Department	36
Total	92

Table (2) shows the details of credit units and contact hours for university and college requirements only.



**Table (2):** Details of university and college requirements for the study plan<sup>1</sup>

	Course Code	Course Name	Credit Units	Contact Hours
<b>University Requirements</b>				
	103 SLM	Islamic Culture	2	2
<b>University requirements</b>		<b>1 Course</b>	<b>2</b>	<b>2</b>
<b>College Requirements</b>				
<b>English Language</b>	000 ENG	English Language – Level 0	2	20*
	001 ENG	English Language – Level 1	3	20*
	002 ENG	English Language – Level 2	3	20*
	003 ENG	English Language – Level 3	3	20*
	004 ENG	English Language – Level 4	3	20*
	193 ENG	Technical English	3	5
	194 ENG	Communication Skills	3	5
	295 ENG	Technical Report Writing	1	3
<b>College Basic Skills</b>	001 CBS	Study Skills	1	1
	203 CBS	Organizational Behavior and Ethics	1	1
	001 CSC	Computer Essentials	1	3
<b>Sciences and Mathematics</b>	091 MATH	Mathematics – I	4	5
	092 MATH	Mathematics – II	4	5
	193 MATH	Calculus	3	4
	195 MATH	Applied Statistics	2	2
	091 PHYS	General Physics	4	5
	191 CHEM	General Chemistry	3	4
<b>Basic Engineering</b>	011 MMET	Engineering Drawing	2	5
	112 MMET	Workshop Technology	3	5
	213 MMET	Industrial Safety and Environment	1	3
	111 EPET	Electric Circuit – I	3	4
<b>College requirements</b>		<b>21 Courses</b>	<b>53</b>	<b>110</b>

<sup>1</sup> \* is giving to half-term courses (8 weeks)

Table (3) shows the scientific groups for the MMET program.

**Table (3):** The scientific groups for the MMET program

Group Name	Number
Basic Mechanical Engineering	1
Material and Machine Elements	2
Mechanical Maintenance	3
Elective Group 1	4
Elective Group 2	5
Elective Group 3	6
Elective Group4	7
Elective Group 5 (Field Training)	8
Project	9

The distribution of credit units and contact hours for compulsory and elective courses is depicted in Table (4) and Table (5).

**Table (4):** The distribution of credit units and contact hours for compulsory courses

Discipline	Course Code	Course name	Credit Units	Contact Hours
Basic Mechanical Engineering (1)	114 MMET	Fluid Mechanics	2	4
	115 MMET	Applied Mechanics	2	2
	116 MMET	Engineering Drawing II	1	3
	216 MMET	Applied Thermodynamics	3	4
Material and Machine Elements (2)	121 MMET	Introduction to Engineering Materials	3	4
	122 MMET	Strength of Materials	2	4
Mechanical Maintenance (3)	231 MMET	Metrology and Quality Control	3	5
	232 MMET	Hydraulics and Pneumatics	2	4
	233 MMET	Welding and Inspection	3	5
Project (9)	291 MMET	Mechanical Maintenance Engineering Technology Project	2	5
<b>Total of Compulsory Courses</b>		<b>10 Courses</b>	<b>23</b>	<b>40</b>

**Table (5):** The distribution of credit units and contact hours for elective courses

Discipline	Course Code	Pre-Requisite	Course name	Credit Units	Contact Hours
Elective Group 1 (24*)	241 MMET	122 MMET	Machine Elements (Elective 11)	3	4
	242 MMET		Elective Course 12		
	243 MMET		Elective Course 13		
	244 MMET		Elective Course 14		
	245 MMET		Elective Course 15		
Elective Group 2 (25*)	251 MMET	112 MMET	Plant Maintenance (Elective 21)	3	4
	252 MMET		Elective Course 22		
	253 MMET		Elective Course 23		
	254 MMET		Elective Course 24		
	255 MMET		Elective Course 25		
Elective Group 3 (26*)	261 MMET	216MMET	Power Generation Systems (Elective 31)	3	4
	262 MMET		Elective Course 32		
	263 MMET		Elective Course 33		
	264 MMET		Elective Course 34		
	265 MMET		Elective Course 35		
Elective Group 4 (27*)	271 MMET	216MMET	Refrigeration and AC Technology (Elective 41)	3	4
	272 MMET		Elective Course 42		
	273 MMET		Elective Course 43		
	274 MMET		Elective Course 44		
	275 MMET		Elective Course 45		
Elective Group 5 (*8*)	181 MMET	194 ENG & Cr Unit	Co-Op Training	2	40
	282 MMET		On-the-Job Training		
<b>Total of Elective Courses</b>			<b>5 Courses</b>	<b>14</b>	<b>56</b>

\* It means the elective course from 1 to 5 within each group and according to sponsorship.

## 12.9. Curriculum

Table (6): Preparatory year<sup>2</sup>

First Semester				Half-term <input type="checkbox"/>			
Course Code	Course name	Pre-requisite	Credit Units	Weekly Contact Hours			
				Lec	Lab	Tut	Total
000 ENG	English Language – Level 0	--	2	5	15	0	20*
001 ENG	English Language – Level 1	000 ENG	3	5	15	0	20*
091 MATH	Mathematics –I	--	4	3	0	2	5
011 MMET	Engineering Drawing	--	2	0	5	0	5
001 CBS	Study Skills	--	1	1	0	0	1
<b>Total</b>	<b>5 Courses</b>		<b>12</b>	<b>9</b>	<b>20</b>	<b>2</b>	<b>31</b>

Second Semester				Half-term <input type="checkbox"/>				Summer Semester <input type="checkbox"/>			
Course Code	Course name	Pre-requisite	Credit Units	Weekly Contact Hours							
				Lec	Lab	Tut	Total				
002 ENG	English Language – Level 2	001 ENG	3	5	15	0	20*				
003 ENG	English Language – Level 3	002 ENG	3	5	15	0	20*				
004 ENG	English Language – Level 4	003 ENG	3	5	15	0	20*				
092 MATH	Mathematics – II	091 MATH	4	3	0	2	5				
091 PHYS	General Physics	--	4	3	2	0	5				
<b>Total</b>	<b>4 Courses</b>		<b>14</b>	<b>11</b>	<b>17</b>	<b>2</b>	<b>30</b>				
	<b>1 Course (Summer Semester)</b>		<b>3</b>	<b>5</b>	<b>15</b>	<b>0</b>	<b>20</b>				
<b>Overall</b>	<b>10 Courses</b>		<b>29</b>	<b>22.5</b>	<b>44.5</b>	<b>4</b>	<b>71</b>				

<sup>2</sup> \* is giving to half-term courses (8 weeks)

**Table (7):** Freshman year

First Semester							
Course Code	Course name	Pre-requisite	Credit Units	Weekly Contact Hours			
				Lec	Lab	Tut	Total
193 ENG	Technical English	004 ENG	3	2	3	0	5
001 CSC	Computer Essentials	--	1	0	3	0	3
193 MATH	Calculus	092 MATH	3	2	0	2	4
191 CHEM	General Chemistry	--	3	2	2	0	4
112 MMET	Workshop Technology	011 MMET	3	1	4	0	5
111 EPET	Electric Circuit – I	091 PHYS	3	2	2	0	4
115 MMET	Applied Mechanics	092 MATH	2	1	0	1	2
<b>Total</b>	<b>7 Courses</b>		<b>18</b>	<b>10</b>	<b>14</b>	<b>3</b>	<b>27</b>

Second Semester							
Course Code	Course name	Pre-requisite	Credit Units	Weekly Contact Hours			
				Lec	Lab	Tut	Total
194 ENG	Communication Skills	004 ENG	3	2	3	0	5
195 MATH	Applied Statistics	092 MATH	2	1	0	1	2
103 SLM	Islamic Culture	--	2	2	0	0	2
114 MMET	Fluid Mechanics	091 PHYS	2	1	3	0	4
116 MMET	Engineering Drawing II	011 MMET	1	0	3	0	3
121 MMET	Introduction to Engineering Materials	091 PHYS	3	2	2	0	4
122 MMET	Strength of Materials	115 MMET	2	1	3	0	4
<b>Total</b>	<b>7 Courses</b>		<b>15</b>	<b>9</b>	<b>14</b>	<b>1</b>	<b>24</b>
<b>Overall</b>	<b>14 Courses</b>		<b>33</b>	<b>19</b>	<b>28</b>	<b>4</b>	<b>51</b>

Summer Semester							
Course Code	Course name	Pre-requisite	Credit Units	Weekly Contact Hours			
				Lec	Lab	Tut	Total
*8* MMET	Elective Group 5	194 ENG + Credit Units <sup>#</sup>	2	0	40	0	40
<b>Total</b>	<b>1 Course</b>		<b>2</b>	<b>0</b>	<b>40</b>	<b>0</b>	<b>40</b>

\*8\* Means the following decisions :

#181 MMET

50 Credit Units for unsponsored students

#282 MMET

70 Credit Units for sponsored students

**Table (8):** Sophomore year

First Semester							
Course Code	Course name	Pre-requisite	Credit Units	Weekly Contact Hours			
				Lec	Lab	Tut	Total
295 ENG	Technical Report Writing	004 ENG	1	0	3	0	3
213 MMET	Industrial Safety and Environment	--	1	0	3	0	3
216 MMET	Applied Thermodynamics	091 PHYS	3	2	2	0	4
231 MMET	Metrology and Quality Control	112 MMET	3	2	3	0	5
24* MMET	Elective Group 1	Acc. to Course	3	2	2	0	4
25* MMET	Elective Group 2	Acc. to Course	3	2	2	0	4
<b>Total</b>	<b>6 Courses</b>		<b>14</b>	<b>8</b>	<b>15</b>	<b>0</b>	<b>23</b>

Second Semester							
Course Code	Course name	Pre-requisite	Credit Units	Weekly Contact Hours			
				Lec	Lab	Tut	Total
203 CBS	Organizational Behavior and Ethics	--	1	1	0	0	1
232 MMET	Hydraulics and Pneumatics	114 MMET	2	1	3	0	4
233 MMET	Welding and Inspection	112 MMET	3	2	3	0	5
26* MMET	Elective Group 3	Acc. to Course	3	2	2	0	4
27* MMET	Elective Group 4	Acc. to Course	3	2	2	0	4
291 MMET	Mechanical Maintenance Engineering Technology Project	295 ENG + 50 Credit Units	2	0	5	0	5
<b>Total</b>	<b>6 Courses</b>		<b>14</b>	<b>8</b>	<b>15</b>	<b>0</b>	<b>23</b>
<b>Overall</b>	<b>12 Courses</b>		<b>28</b>	<b>16</b>	<b>30</b>	<b>0</b>	<b>46</b>

## 12.10. Statistics

Table (9) shows the percentage distribution of credit units and contact hours for university, college, and department requirements.

**Table (9):** The distribution of credit units and contact hours with percentage

Requirement		No. of Courses	Credit Units		Contact Hours
			No.	%	
Humanities	Culture, Ethics, and Skills	3	4	4.34	4
	English Language	8	21	22.83	63
Computer Science		1	1	1.09	3
Mathematics and Science		6	20	21.74	25
Basic Engineering		4	9	9.78	17
Mechanical Maintenance Engineering Technology		15	37	40.22	96
<b>Total</b>		<b>37</b>	<b>92</b>	<b>100</b>	<b>208</b>

Table (10) compares between the number of practical and theoretical courses with percentages.

**Table (10):** Comparison between the number of practical and theoretical courses with percentage

	Practical Courses		Theoretical Courses		Total
	Number	%	Number	%	
All courses	28	75.68	9	24.32	37
Program Courses only	14	93.33	1	6.67	15

Finally Table (11) shows the distribution of credit units over academic levels.

**Table (11):** The distribution of credit units over academic levels

Semester	University and College Requirements	Department Requirements	Total for each level	Total for Academic Year
First	12	--	12	29
Second	14	--	14	
Summer (1)	3	--	3	
Third	16	2	18	33
Fourth	7	8	15	
Summer (2)	--	2	2	2
Fifth	2	12	14	28
Sixth	1	13	14	
<b>Total</b>	<b>55</b>	<b>37</b>	<b>92</b>	

## 12.11. References

**Table (12):** Comparison with corresponding programs in terms of program requirements

Requirements	Credit Units (CAIT)	Credit Units (JIC)	Credit Units (YIC)
University	2	2	4
College	53	61	55
Department	37	39	38
<b>Total</b>	<b>92</b>	<b>102</b>	<b>97</b>

**Table (13):** Comparison with local and international colleges (university and college courses)

Course Code	Course Name	CAIT	JIC	YIC	SCO	EMC	CaC	CeC
103 SLM	Islamic Culture	√	√	√	--	--	--	--
001 CSC	Computer Essentials	√	√	√	√	√	√	√
000 ENG	English Language – Level 0	√	√	√	--	--	--	--
001 ENG	English Language – Level 1							
002 ENG	English Language – Level 2							
003 ENG	English Language – Level 3							
004 ENG	English Language – Level 4							
193 ENG	Technical English	√	√	√	--	√	--	--
194 ENG	Communication Skills	√	√	√	--	--	√	√
295 ENG	Technical Report Writing	√	√	√	--	√	√	√
001 CBS	Study Skills	√	√	--	--	--	--	--
203 CBS	Organizational Behavior and Ethics	√	√	--	--	--	√	√
091 MATH	Mathematics – I	√	√	√	√	√	√	√
092 MATH	Mathematics – II	√	√	√	√	√	√	√
193 MATH	Calculus	√	√	√	√	--	√	√
295 MATH	Applied Statistics	√	--	√	--	--	√	--
091 PHYS	General Physics	√	√	√	--	--	√	√
191 CHEM	General Chemistry	√	√	√	--	--	--	--
011 MMET	Engineering Drawing	√	√	√	√	√	√	√
112 MMET	Workshop Technology	√	√	√	√	√	√	√
213 MMET	Industrial Safety and Environment	√	√	√	√	√	√	√
111 EPET	Electric Circuit – I	√	√	--	√	√	√	√

- CAIT College of Applied Industrial Technology
- JIC Jubail Industrial College
- YIC Yanbu Industrial College
- SCO Sheridan College Oakville
- EMC East Mississippi Community College
- CaC Canadore College, Toronto, Canada
- CeC Centennial College, Toronto, Canada



**Table (14):** Comparison with local and international colleges (program courses)

Course Code	Course Name	CAIT	JIC	YIC	SCO	EMC	CaC	CeC
114 MMET	Fluid Mechanics	√	√	√	√	√	√	√
115 MMET	Applied Mechanics	√	√	√	√	--	√	√
116 MMET	Engineering Drawing II	√	√	√	--	--	--	--
216 MMET	Applied Thermodynamics	√	√	√	--	--	√	√
121 MMET	Introduction to Engineering Materials	√	√	√	√	--	√	√
122 MMET	Strength of Materials	√	√	--	--	--	--	√
231 MMET	Metrology and Quality Control	√	√	√	√	--	√	√
232 MMET	Hydraulics and Pneumatics	√	√	√	√	√	√	√
233 MMET	Welding and Inspection	√	√	√	--	√	--	--
241 MMET	Machine Elements (ELECTIVE 11)	√	√	√	√	√	√	√
251 MMET	Plant Maintenance (ELECTIVE 21)	√	√	√	--	√	--	--
261 MMET	Power Generation Systems (ELECTIVE 31)	√	√	--	√	--	--	--
271 MMET	Refrigeration and Air Conditioning Technology (ELECTIVE 41)	√	√	√	--	--	--	--
181 MMET	Co-Op Training (ELECTIVE 5)	√	√	√	√	--	√	--

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### 13. Description of Courses

#### 13.1. Description of university requirements courses

<b>Course Code</b>	<b>103 SLM</b>			
<b>Course Title</b>	<b>Islamic Culture</b>			
<b>Year/Level</b>	<b>Freshman/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>
<b>Prerequisite</b>	<b>None</b>			
<b>Course Description</b>	<p>The course aims to introduce the Islamic way of economic life and the relationship of man's life with the earning of money and spending. It looks at the relationship of financial communities with each other in terms of distribution and trading, as well as the rules and legal provisions that regulate economic life and financial transactions. It compares existing economic systems, in order to declare a comparative statement of Islamic economic attributes and basic characteristics.</p>			

### 13.2. Description of college requirements courses

<b>Course Code</b>	<b>000 ENG</b>			
<b>Course Title</b>	<b>English Language – Level 0 (half Term – 8 weeks)</b>			
<b>Year/Level</b>	<b>Preparatory/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>2</b>	<b>5</b>	<b>15</b>	<b>0</b>
<b>Prerequisite</b>	<b>None</b>			
<b>Course Description</b>	<p>This is a 2 credit unit course designed for students at the beginning of the preparatory year. The course is labelled 000 for it is recognized that the students placed in the class have score so low on the entrance/proficiency they would not normally be accepted into the Preparatory Year program. The general aim of this course is to begin at the A0 - starter level.</p> <p>ENG 000 is a starter level course intended to provide students with a foundation from which they can advance from A0 to A1 on the Common European Framework of Reference for Languages (CEFR). At the successful conclusion of this course students will have attained sufficient basic English skills to understand sentences (recognise complete sentences, identify core vocabulary and components of the sentence, and identify basic punctuation functions). Another objective of this course is to provide teaching-learning activities which should contribute to the development of the skill of understanding spoken English, particularly in an academic context, e.g. lectures and discussions. Since English is the language of instruction at BCC, students must possess the requisite ability to listen to a lecture in English and to take notes on it; the lecture method is an integral part of the instructional process.</p>			

<b>Course Code</b>	<b>001 ENG</b>			
<b>Course Title</b>	<b>English Language – Level 1 (half Term – 8 weeks)</b>			
<b>Year/Level</b>	<b>Preparatory/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>5</b>	<b>15</b>	<b>0</b>
<b>Prerequisite</b>	<b>000 ENG or Placement Test</b>			
<b>Course Description</b>	<p>This is a 3 credit unit course designed for students at the beginning of the preparatory year. The general aim of this course is to bring students to a near A2 level on the CEFR.</p> <p>ENG 001 is a starter level for approximately 40% of the college's new intake students. At the successful conclusion of this course students will have attained sufficient basic English skills to understand sentences (recognize complete sentences, identify core vocabulary and components of the sentence, and identify basic punctuation functions). Another objective of this course is to provide teaching-learning activities which should contribute to the development of the skill of understanding spoken English, particularly in an academic context, e.g. lectures and discussions.</p>			

<b>Course Code</b>	<b>002 ENG</b>			
<b>Course Title</b>	<b>English Language – Level 2 (half Term – 8 weeks)</b>			
<b>Year/Level</b>	<b>Preparatory/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>5</b>	<b>15</b>	<b>0</b>
<b>Prerequisite</b>	<b>001 ENG or Placement Test</b>			
<b>Course Description</b>	<p>This is a 3-credit unit course designed for students midway through the preparatory year. The course shifts instruction from General English to technical English required for their major and the work place setting.</p> <p>At the successful conclusion of this course students will have attained sufficient English skills to understand sentences (recognise complete sentences, identify core vocabulary and components of the sentence, and identify basic punctuation functions). Another objective of this course is to provide teaching-learning activities which should contribute to the development of the skill of understanding spoken English, particularly in an academic context, e.g. lectures and discussions.</p>			

<b>Course Code</b>	<b>003 ENG</b>			
<b>Course Title</b>	<b>English Language – Level 3 (half Term – 8 weeks)</b>			
<b>Year/Level</b>	<b>Preparatory/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>5</b>	<b>15</b>	<b>0</b>
<b>Prerequisite</b>	<b>002 ENG or Placement Test</b>			
<b>Course Description</b>	<p>This is a 3 credit unit course designed for students in the upper levels of the preparatory year. This course carries on with the subjects introduced in ENG_002. The course is designed to train students in technical English within ‘simulated’ work place settings. ENG_003 is an elementary course intended to provide students with a further foundation from which they can advance from A2 to B1 on the Common European Framework of Reference for Languages (CEFR).</p> <p>The course aims to help learners achieve an overall English language proficiency of Elementary User defined as A2 (CEFR), developing generative language to interact in an elementary way, such as asking and answering simple questions. A second goal is to introduce the student to technical vocabulary needed in the core diploma programs.</p>			

<b>Course Code</b>	<b>004 ENG</b>			
<b>Course Title</b>	<b>English Language – Level 4 (half Term – 8 weeks)</b>			
<b>Year/Level</b>	<b>Preparatory/3</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>5</b>	<b>15</b>	<b>0</b>
<b>Prerequisite</b>	<b>003 ENG or Placement Test</b>			
<b>Course Description</b>	<p>This is a 3 credit unit course designed for students completing their first year of English study. The course concentrates on technical English required for their major and the work place setting.</p> <p>The main objective of this course is to provide teaching-learning activities which should contribute to the development of the skill of understanding spoken English, particularly in an academic context, e.g. lectures and discussions.</p>			

<b>Course Code</b>	<b>193 ENG</b>			
<b>Course Title</b>	<b>Technical English</b>			
<b>Year/Level</b>	<b>Freshman/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>2</b>	<b>3</b>	<b>0</b>
<b>Prerequisite</b>	<b>004 ENG</b>			
<b>Course Description</b>	<p>The program's mission is to prepare students to study in English at a tertiary level in the fields of Mechanical, Electrical and Chemical Engineering. The program's operational goal is to equip students with sufficient language skills to succeed in the college's programs. Therefore, the operational goal of this course is to facilitate and improve oral proficiency at the appropriate level. The course will be reviewed at the end of the academic year. Student outcomes will be compared to course objectives to determine areas of program improvement. At that time, teaching quality, text quality, class size, appropriateness of course objectives and time frame, and extra-curricular support will be assessed as possible change variables.</p>			

<b>Course Code</b>	<b>194 ENG</b>			
<b>Course Title</b>	<b>Communication Skills</b>			
<b>Year/Level</b>	<b>Freshman/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>2</b>	<b>3</b>	<b>0</b>
<b>Prerequisite</b>	<b>004 ENG</b>			
<b>Course Description</b>	<p>194 ENG is a pre-intermediate level course intended to provide students with a further foundation from which they can consolidate B1 learning skills on the Common European Framework of Reference for Languages (CEFR). It gives students the opportunity to practice and expand their communicative competency and to extend the limits of their knowledge of vocabulary and idioms, within the context of oral English. It encourages students to think quickly, to listen, interpret and respond, to express opinions, and to justify their ideas. Students are encouraged to participate in class discussion and to ask freely on any aspect of the language with which they require help. Students prepare PowerPoint slideshows and practice and deliver spoken presentations. Students planning to participate in the Co-Op summer training program improve in both speaking and writing, in preparation for the program.</p>			

<b>Course Code</b>	<b>295 ENG</b>			
<b>Course Title</b>	<b>Technical Report Writing</b>			
<b>Year/Level</b>	<b>Sophomore/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>
<b>Prerequisite</b>	<b>004 ENG</b>			
<b>Course Description</b>	<p>Technical Report Writing will give students experience in preparing technical reports. Following the Final Report Template, it will guide students through to the completion of the written technical report. Oral interview skills will be introduced.</p>			

<b>Course Code</b>	<b>001 CBS</b>			
<b>Course Title</b>	<b>College Study Skills</b>			
<b>Year/Level</b>	<b>Preparatory/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>Prerequisite</b>	<b>None</b>			
<b>Course Description</b>	<p>The course will cover some of the key skills needed by college students including: goal-setting, motivation, time and stress management, classroom skills, preparing for exams, and analytical/critical thinking.</p>			

<b>Course Code</b>	<b>203 CBS</b>			
<b>Course Title</b>	<b>Organizational Behaviour and Ethics</b>			
<b>Year/Level</b>	<b>Sophomore/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>Prerequisite</b>	<b>None</b>			
<b>Course Description</b>	<p>The course is designed to provide students with an understanding and awareness of the various factors that influence individual and group behavior within organizations. It also explores the ethical aspects of decision making and behavior in the workplace. The field of organizational behavior derives many concepts and methods from the behavioral and social sciences such as psychology, sociology, social psychology, and anthropology. In the workplace today, a good understanding of the theory of human relations in organizations is essential. Some contemporary organizational issues include individual and group dynamics, motivation, leadership, organizational structure, morale, power, organizational change, and development.</p>			

<b>Course Code</b>	<b>001 CSC</b>			
<b>Course Title</b>	<b>Computer Essentials</b>			
<b>Year/Level</b>	<b>Preparatory/Second</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>
<b>Prerequisite</b>	<b>None</b>			
<b>Course Description</b>	<p>The course is an introduction to computer systems components, Windows Operating Systems and its utilities. The course also gives hands-on exposure to applications software, as well as an introduction to Internet tools and technologies.</p>			

<b>Course Code</b>	<b>091 MATH</b>			
<b>Course Title</b>	<b>Mathematics – I</b>			
<b>Year/Level</b>	<b>Preparatory/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>4</b>	<b>3</b>	<b>0</b>	<b>2</b>
<b>Prerequisite</b>	<b>None</b>			
<b>Course Description</b>	<p>The course is designed to provide knowledge and educational experience to students in basic and fundamental mathematical concepts required for technical courses. The topics may include: factoring of polynomials, equations and inequalities in one variable, two dimensional co-ordinate system and graphs, introduction to functions, linear and quadratic functions, synthetic division, remainder theorem and the factor theorem, and zeros of polynomial functions.</p>			

<b>Course Code</b>	<b>092 MATH</b>			
<b>Course Title</b>	<b>Mathematics – II</b>			
<b>Year/Level</b>	<b>Preparatory/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>4</b>	<b>3</b>	<b>0</b>	<b>2</b>
<b>Prerequisite</b>	<b>091 MATH</b>			
<b>Course Description</b>	The course is a logical extension of 091 MATH and designed for students studying for the AS degree. The course introduces some advanced algebraic topics such as inverse of functions, exponential and logarithmic functions with their graphs and their properties, trigonometric functions, trigonometric identities, inverse trigonometric functions, parabolas and ellipses, matrices and system of linear equations. The course also introduces the concepts of elementary analytic geometry.			

<b>Course Code</b>	<b>193 MATH</b>			
<b>Course Title</b>	<b>Calculus</b>			
<b>Year/Level</b>	<b>Freshman/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>2</b>	<b>0</b>	<b>2</b>
<b>Prerequisite</b>	<b>092 MATH</b>			
<b>Course Description</b>	This is a theoretical course designed to provide knowledge and educational experience to students in order to solve mathematical problems involved in technical specialty courses. The topics may include: limits and continuity, differentiation, applications of differentiation, indeterminate form, L' Hopital rule, indefinite and definite integrals with their applications. The course should enable the students to acquire sufficient understanding in ordinary differential equations of first order and modeling.			

<b>Course Code</b>	<b>195 MATH</b>			
<b>Course Title</b>	<b>Applied Statistics</b>			
<b>Year/Level</b>	<b>Freshman/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>Prerequisite</b>	<b>092 MATH</b>			
<b>Course Description</b>	The aim of this course is to develop the students' understanding of statistical concepts and ability to apply them in their respective streams. The topics may include: sampling classification and statistical analysis of data. The course describes a non-tabulated (tabulated) set of data through frequency, relative frequency, cumulative frequency distributions and their graphical presentations, measures of central tendency, measures of dispersion, analysis of ordered pairs data through linear correlation and linear regression, probability, normal distribution, binomial distribution, T-distribution, and index numbers.			



<b>Course Code</b>	<b>091 PHYS</b>			
<b>Course Title</b>	<b>General Physics</b>			
<b>Year/Level</b>	<b>Preparatory/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>0</b>
<b>Prerequisite</b>	<b>None</b>			
<b>Course Description</b>	<p>This course is designed to introduce the basic principles of engineering mechanics for study of applied technology. The course identifies measuring using both imperial and metric systems with conversion between them, then provides physics concepts and applications in motion and forces, work and energy, electrostatic forces, magnetism, DC and AC electric circuit components, light nature, reflection and refraction of light. Techniques, skills, and modern computerized apparatus necessary to make laboratory measurements possible are adopted. Experiments are made to support the theory and to meet the needs of engineering technology programs.</p>			

<b>Course Code</b>	<b>191 CHEM</b>			
<b>Course Title</b>	<b>General Chemistry</b>			
<b>Year/Level</b>	<b>Freshman/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>2</b>	<b>2</b>	<b>0</b>
<b>Prerequisite</b>	<b>None</b>			
<b>Course Description</b>	<p>This course offers understanding of chemistry for students who have not had this course taught in English. The course enables students to learn the states of matter and units of measurements, atoms, molecules and ions, the modern view of the atomic structure, the electronic structure of atoms and related hypothesis, periodic table, stoichiometry (calculations with chemical formulas, types of chemical reaction), solutions (definition, properties and concentrations), solubility and precipitation reactions, red-ox reaction and its implication, chemistry of nonmetals, basic concepts of chemical bonding, saturated and unsaturated hydrocarbons, and organic compounds. The practical components of the course include teaching students awareness of safety regulations as well as their ability in experimentation, observation, measurements, and documentation.</p>			

<b>Course Code</b>	<b>011 MMET</b>			
<b>Course Title</b>	<b>Engineering Drawing</b>			
<b>Year/Level</b>	<b>Preparatory/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>2</b>	<b>0</b>	<b>5</b>	<b>0</b>
<b>Prerequisite</b>	<b>None</b>			
<b>Course Description</b>	This introductory course in drawing and drafting covers the use of drawing instruments, geometrical operations, sketching and shape descriptions, orthographic views, sectional views, and reading assembly drawings. The course also introduces the drawing of basic machine elements (gears, fasteners, pulleys, coupling, bearings, shafts, keys) with identification.			

<b>Course Code</b>	<b>112 MMET</b>			
<b>Course Title</b>	<b>Workshop Technology</b>			
<b>Year/Level</b>	<b>Freshman/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>1</b>	<b>4</b>	<b>0</b>
<b>Prerequisite</b>	<b>011 MMET</b>			
<b>Course Description</b>	This subject deals with various hand tools, measuring instruments, production, and welding machines. This is an introductory course which provides the basic theoretical and practical skills on workshop technology including precautions inside workshop and safety rules for hand tools various machines. The course contents may include definition of machinist and use of hand tools and measuring instruments used in bench and sheet metal working, and dealing with the machines settled in production workshops including turning lathes, shaper machines, milling machines, drilling machines, and welding techniques.			

<b>Course Code</b>	<b>213 MMET</b>			
<b>Course Title</b>	<b>Industrial Safety and Environment</b>			
<b>Year/Level</b>	<b>Sophomore/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>
<b>Prerequisite</b>	<b>None</b>			
<b>Course Description</b>	This course introduces the concept of health and safety through practical training in a work environment. It aims at forming within the students sound attitudes towards safety and environment. Students recognize general safety, mechanical, electrical, and chemical hazards, fire safety, the factors influencing environmental pollution, and the regulatory methods to control them.			

<b>Course Code</b>	<b>111 EPET</b>			
<b>Course Title</b>	<b>Electric Circuit – I</b>			
<b>Year/Level</b>	<b>Freshman/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>2</b>	<b>2</b>	<b>0</b>
<b>Prerequisite</b>	<b>091 PHYS</b>			
<b>Course Description</b>	This is a foundation course which introduces students to the elements of electrical circuits, variables in electrical circuits, Ohm's and Kirchhoff's laws, series and parallel connections, DC circuits: simple resistance circuitry, star and delta connections, current and voltage sources and conversion between them, circuit analysis, cumulative effect of sources, Thevenin's theorem, maximum power, AC circuits: elements representation with respect to time, vector representation of voltage and current, implementation of methods utilized in analysis of circuits, enhancing power factor.			

### 13.3. Description of the compulsory courses for the MMET program

<b>Course Code</b>	<b>114 MMET</b>			
<b>Course Title</b>	<b>Fluid Mechanics</b>			
<b>Year/Level</b>	<b>Freshman/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>2</b>	<b>1</b>	<b>3</b>	<b>0</b>
<b>Prerequisite</b>	<b>091 PHYS</b>			
<b>Course Description</b>	This course is concerned with the fundamentals of fluid mechanics. This includes the study of fluids statics, analysis of the fluid flow, flow measurements. This class provides students with principal concepts and methods of fluid mechanics. Topics covered in the course include pressure, hydrostatics, and buoyancy; fluid kinematics, flow through pipes, fluid dynamics, and momentum equation and its applications; dimensional analysis.			

<b>Course Code</b>	<b>115 MMET</b>			
<b>Course Title</b>	<b>Applied Mechanics</b>			
<b>Year/Level</b>	<b>Freshman/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>Prerequisite</b>	<b>092 MATH</b>			
<b>Course Description</b>	Applied mechanics is a branch of the physical sciences and the practical application of mechanics. Applied mechanics, bridges the gap between physical theory and its application to technology, such as rigging and lifting equipment. It is used in many fields of engineering, especially mechanical engineering. The course is concerned with determination of safe working force to move or lift a load as well as calculating the center of gravity of load and area moment of inertia.			

<b>Course Code</b>	<b>116 MMET</b>			
<b>Course Title</b>	<b>Engineering Drawing II</b>			
<b>Year/Level</b>	<b>Freshman/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>
<b>Prerequisite</b>	<b>011 MMET</b>			
<b>Course Description</b>	This course provides students with a broad introduction into 2-dimensional and 3-dimensional Computer-Aided Design (CAD) and modeling with a focus on construction specific applications, including Building Information Modeling (BIM). Students will learn how to use industry leading CAD software programs (Autodesk AutoCAD) to model construction projects, and then create and distribute basic, industrial standard manufacturing drawings.			

<b>Course Code</b>	<b>121 MMET</b>			
<b>Course Title</b>	<b>Introduction to Engineering Materials</b>			
<b>Year/Level</b>	<b>Freshman/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>2</b>	<b>2</b>	<b>0</b>
<b>Prerequisite</b>	<b>091 PHYS</b>			
<b>Course Description</b>	This subject deals with the materials commonly used in various engineering applications and manufacturing processes, differences in commonly used metals, non-metals, polymers, ceramics, and alloys. This is an introductory course which provides the basic theoretical and practical skills on materials science. The course contents may include definition of basic terms used in materials science, types of materials and structures, materials properties, physics and chemistry principles related to materials structure to their properties, the crystalline structure, characteristics of crystal planes & directions crystal defects and their effects on properties, and the phase diagrams for solid materials.			

<b>Course Code</b>	<b>122 MMET</b>			
<b>Course Title</b>	<b>Strength of Materials</b>			
<b>Year/Level</b>	<b>Freshman/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>2</b>	<b>1</b>	<b>3</b>	<b>0</b>
<b>Prerequisite</b>	<b>115 MMET</b>			
<b>Course Description</b>	This course covers basic mechanical properties and testing of materials by combining theories with standard tests, as well as various methods of calculating the stresses and strains in structural members, such as beams, columns, and shafts with prediction to the response of the body under loading.			

<b>Course Code</b>	<b>216 MMET</b>			
<b>Course Title</b>	<b>Applied Thermodynamics</b>			
<b>Year/Level</b>	<b>Sophomore/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	3	2	2	0
<b>Prerequisite</b>	<b>091 PHYS</b>			
<b>Course Description</b>	<p>This is an introductory course which provides the basic theoretical and practical skills in applied thermodynamics. The course contents may include definition of basic terms used in thermodynamics, sources of energy, energy equations with their applications, and principle stages, working principles, construction, and performance testing of internal combustion engines with applications and testing, The course also may provide estimation of work and heat transfers during thermodynamic processes and deals with types, applications, construction, working principles, operation and performance testing of gas turbines, boilers and steam turbines, and basic principles of refrigeration and air conditioning systems.</p>			

<b>Course Code</b>	<b>231 MMET</b>			
<b>Course Title</b>	<b>Metrology and Quality Control</b>			
<b>Year/Level</b>	<b>Sophomore/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	3	2	3	0
<b>Prerequisite</b>	<b>112 MMET</b>			
<b>Course Description</b>	<p>This course deals with techniques and instruments of measurement used in manufacturing activities. Students learn to use various measuring tools and instruments and apply statistical tools for quality control.</p>			

<b>Course Code</b>	<b>232 MMET</b>			
<b>Course Title</b>	<b>Hydraulics and Pneumatics</b>			
<b>Year/Level</b>	<b>Sophomore/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>2</b>	<b>1</b>	<b>3</b>	<b>0</b>
<b>Prerequisite</b>	<b>114 MMET</b>			
<b>Course Description</b>	<p>This course is directed to study the principles of operation, and calculation of fluid power systems (hydraulics and pneumatics), and identify pipes, fittings and valves with their use and symbols. In addition, special attention will be paid to cover the construction, troubleshooting, maintenance and testing of several types of valves in fluid power systems. Also, the course will cover a good theoretical base of fluid power systems which enables the further analysis of the static and dynamic performance of different elements of fluid power systems. Together with the theoretical study, the course includes the different case studies of typical industrial circuits. Laboratory sessions involving the use of computers for simulation and analysis of different systems and individual elements performance are used.</p>			

<b>Course Code</b>	<b>233 MMET</b>			
<b>Course Title</b>	<b>Welding and Inspection</b>			
<b>Year/Level</b>	<b>Sophomore/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>2</b>	<b>3</b>	<b>0</b>
<b>Prerequisite</b>	<b>112 MMET</b>			
<b>Course Description</b>	<p>This course provides an overview of welding tools and equipment, metallurgy, and joints' design. The course concerns various welding processes, welded joints, welding symbols/codes and blueprints, destructive and nondestructive testing of weldments, accepted testing requirements and procedures, measurement systems, duties and responsibilities of inspectors, quality assurance/quality control and qualification of welders and welding operators.</p>			

<b>Course Code</b>	<b>291 MMET</b>			
<b>Course Title</b>	<b>Mechanical Maintenance Engineering Technology Project</b>			
<b>Year/Level</b>	<b>Sophomore/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>2</b>	<b>0</b>	<b>5</b>	<b>0</b>
<b>Prerequisite</b>	<b>295 ENG + 50 Credit Units</b>			
<b>Course Description</b>	<p>Final Year Project (FYP) is a compulsory final year course which students of BCC must take at the end of their Academic Program to complete the requirements of their Graduate Diploma degree. The concept of FYP emphasizes practical work more than theoretical studies. FYP is an opportunity for final year technical students to demonstrate their capabilities in applying the knowledge acquired during their academic program to produce workpiece, service broken or damaged components such as sealing, gaskets, O-rings, fasteners, studs, couplings, bearings, etc, as well as fabricate component and assemble/disassemble parts using hand and power tools. It enables the students to experience similar and/or real situation on how projects are carried out in the industry.</p>			

#### 13.4. Description of the elective courses for the MMET program

##### Elective Group (1) (24\*)

<b>Course Code</b>	<b>241 MMET</b>			
<b>Course Title</b>	<b>Machine Elements</b>			
<b>Year/Level</b>	<b>Sophomore/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>2</b>	<b>2</b>	<b>0</b>
<b>Prerequisite</b>	<b>122 MMET</b>			
<b>Course Description</b>	<p>This course deals with machine elements such as shafts, bearings, keys and couplings, gears, belts, chains, and the use of empirical rules in selection of machine elements for specific application, as well as get the main properties and characteristics of these machine parts from technical drawings. Blue print reading of the commonly-used machine elements is the main objective of this course.</p>			

**Elective Group (2) (25\*)**

<b>Course Code</b>	<b>251 MMET</b>			
<b>Course Title</b>	<b>Plant Maintenance</b>			
<b>Year/Level</b>	<b>Sophomore/1</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>2</b>	<b>2</b>	<b>0</b>
<b>Prerequisite</b>	<b>112 MMET</b>			
<b>Course Description</b>	<p>The course introduces the student to the basic definition of machinist terms and state their use, as well as the concepts of plant maintenance, functions and techniques, including preventive maintenance, predictive maintenance, non-destructive testing, troubleshooting, and fault diagnosis. The main mechanical maintenance activities presented are: lubrication and maintain lubrication system, leveling, alignment, equipment installation, replace packing in a stuffing box, and sealing (the use of sealing devices, manufacture and replace gaskets, replace lip seals and O-rings, remove and reinstall Flowserve U-type mechanical seals), and install different types of bearings. The course also presents the basic maintenance activities for different plants and mechanical systems such as power plants, compressor plants, pumping stations, mechanical power transmission, hydraulic and pneumatic systems, etc. Workshop exercises will enhance the knowledge and hand skills of students in the field of mechanical maintenance.</p>			

**Elective Group (3) (26\*)**

<b>Course Code</b>	<b>261 MMET</b>			
<b>Course Title</b>	<b>Power Generation Systems</b>			
<b>Year/Level</b>	<b>Sophomore/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>2</b>	<b>2</b>	<b>0</b>
<b>Prerequisite</b>	<b>216 MMET</b>			
<b>Course Description</b>	<p>This course deals with different types of power generation systems, particularly steam power plants, gas power plants, combined cycle power generation, and internal combustion engines. It covers combustion, operation and control of boilers, super-heaters, condensers, cooling towers, and water treatment. Students learn to analyze steam and gas power plants. It also deals with the operation, maintenance, and troubleshooting of internal combustion engines.</p>			



**Elective Group (4) (27\*)**

<b>Course Code</b>	<b>271 MMET</b>			
<b>Course Title</b>	<b>Refrigeration and Air Conditioning Technology</b>			
<b>Year/Level</b>	<b>Sophomore/2</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>3</b>	<b>2</b>	<b>2</b>	<b>0</b>
<b>Prerequisite</b>	<b>216MMET</b>			
<b>Course Description</b>	The course is designed to provide student technicians with theoretical and practical skills in refrigeration and air conditioning. The course content includes refrigeration and air conditioning principles, vapor-compression cycle performance, psychrometric processes, tubing and fittings, and theory of operation of each component such as compressor, condenser, expansion device, and evaporator. Automatic controls, advanced psychrometric processes, heating and cooling load estimations, service diagnosis, and maintenance procedures for refrigeration and air conditioning systems are also included. This course is supported by laboratory exercises.			

**Elective Group (5) (\*8\*)**

<b>Course Code</b>	<b>181 MMET</b>			
<b>Course Title</b>	<b>Co-Op Training</b>			
<b>Year/Level</b>	<b>Freshman/ Training Semester</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>2</b>	<b>0</b>	<b>40</b>	<b>0</b>
<b>Prerequisite</b>	<b>194 ENG + 50 Credit Units for unsponsored students</b>			
<b>Course Description</b>	The cooperative training program involves placement of students in industries relevant to their academic and technical interests. The students spend eight (8) weeks during the summer semester in the Freshman year in companies or industries to work there and receive practical training.			

<b>Course Code</b>	<b>282 MMET</b>			
<b>Course Title</b>	<b>On-the-Job Training (OJT)</b>			
<b>Year/Level</b>	<b>Sophomore/ Training Semester</b>			
<b>Hours</b>	<b>Credit</b>	<b>Lec.</b>	<b>Lab.</b>	<b>Tut.</b>
	<b>2</b>	<b>0</b>	<b>40</b>	<b>0</b>
<b>Prerequisite</b>	<b>194 ENG + 70 Credit Units for sponsored students</b>			
<b>Course Description</b>	This course is directed especially for sponsored students to undergo training at their sponsors' work places. The training lasts sixteen (16) weeks during the summer semester in the Sophomore year. This kind of on-the-job training helps students to transfer their academic experience from class halls into real practical life, enhances students' practical experience, and enables them to take responsibility from the first day of employment.			

### 13.5. Hierarchy of the MMET program

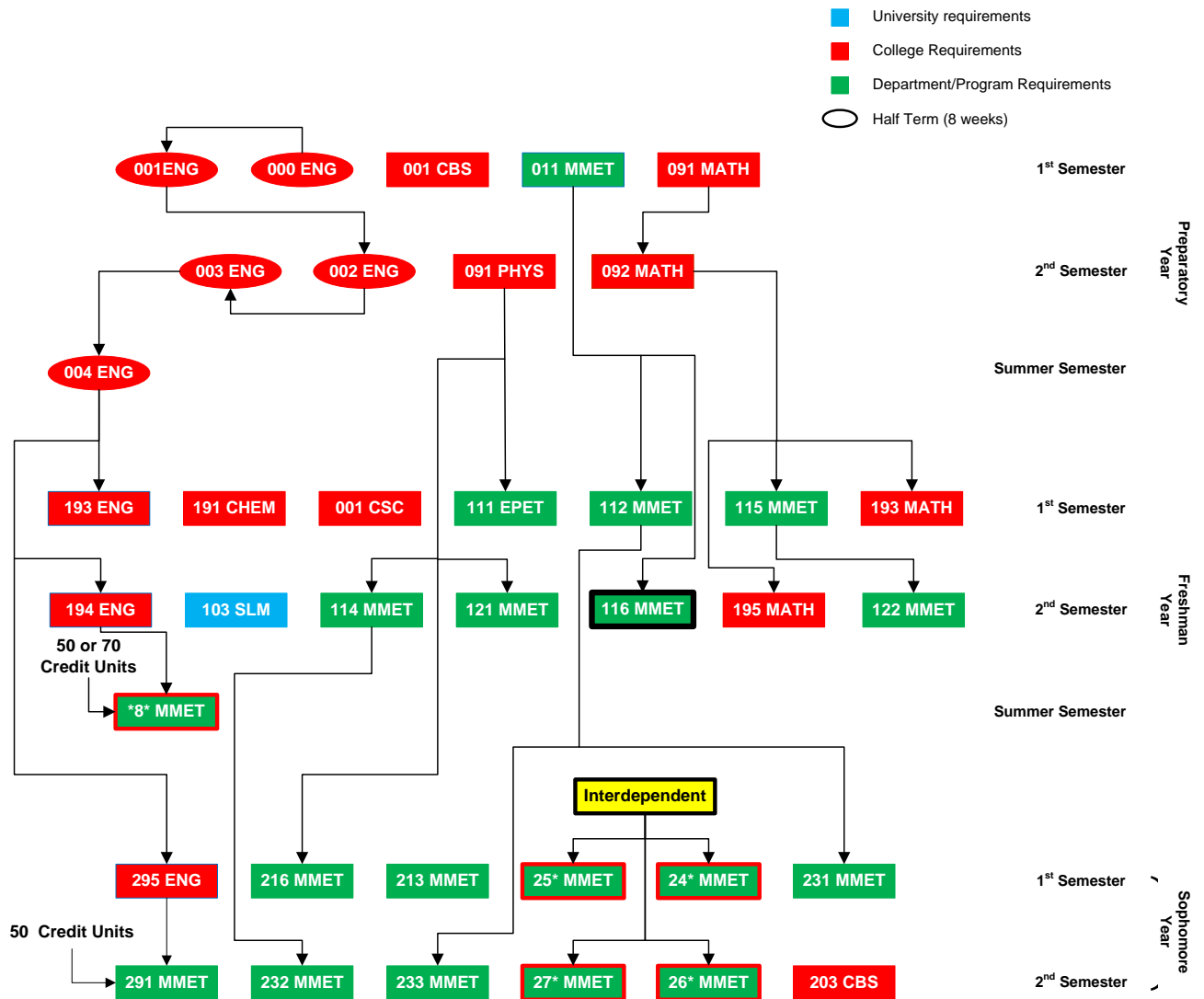


Figure – 7 The flowchart and hierarchy of the MMET program

### 13.6. Evaluation model for MMET program

**College:** College of Applied Industrial Technology    **Program:** Mechanical Maintenance Engineering Technology  
Baish Governorate  
**Department:** Mechanical Engineering Technology    **Date:** 19/05/1442 H (03/01/2021)

Point	Met	Not Met	Notices
College Origination	√	--	
Program Mission	√	--	
The Agreement between University and College Missions	√	--	
Program Objectives	√	--	
Program Outcomes	√	--	
The Survey of Labor Market and Society Needs	√	--	
Comparison with Corresponding Programs (Similarities and Differences)	√	--	
Reasons for Selection	√	--	
Identification of Human Resources for the Program	√	--	
Identification of Facilities and Equipment for the Program	√	--	
The Requirements for Joining the Program	√	--	
The Requirements of Academic Degree Achievement	√	--	
Duration of Study	√	--	
Degree Awarded	√	--	
Number of Credit Units for Preparatory Year (if Applicable)	√	--	
Identification of University Requirements	√	--	
Identification of College Requirements	√	--	
Identification of Department Requirements	√	--	
The Agreed Credit Units with National Qualification Framework	√	--	
Coding and Numbering for Courses	√	--	
Program Description	√	--	Exists in college webpage
Self Study (for Updated Plan)	√	--	New plan starts 20212
Short Description of Courses	√	--	
Detailed Description of Courses (Including Evaluation and References)	√	--	Exists in college webpage
Outside Arbitration for the Plan	√	--	
External Evaluator Report	√	--	
Response to the External Evaluator Report	√	--	
Fields of Work	√	--	
The Differences between Older and Updated Plan	√	--	002CBS replaced with 116MMET
The Plan in English	√	--	Arabic Language exists
References	√	--	

