

3.1.2 Structure of credits

Total credits	147	Credits
Subject area type		
3.1.2.1 General education	30	Credits
A. Language	15	Credits
- Compulsory Courses	6	Credits
- Elective Courses	9	Credits
B. Social Sciences and Humanities	7	Credits
C. Science and Mathematics	6	Credits
D. Physical Education	2	Credits
3.1.2.2 Technical Courses	111	Credits
A. Science Courses	24	Credits
B. Engineering Core Courses	25	Credits
C. Material Engineering Courses	38	Credits
- Compulsory Courses	29	Credits
- Elective Courses	9	Credits
D. Professional Electives	24	Credits
- Metallurgical Engineering Professional Electives	24	Credits
Compulsory Courses	17	Credits
Elective Courses	7	Credits
E. Industrial Training	240	hours
3.1.2.3 Free Electives	6	Credits

Remarks

- 1) All of the 010623XXX subjects are taught in English, except the following ones which may be taught in Thai or English : 010623309 Quality Control and Management, 010623310 Engineering Economy and 010623320 Safety in Materials Engineering.
- 2) This curriculum might be subject to a minor change which will be announced later.

3.1.3 Structure of credits

3.1.3.1 General Education	30	Credits
A. Language	15	Credits
Compulsory Courses	6	Credits
Complete all of following courses.		
080103001 English I		3(3-0-6)*
080103002 English II		3(3-0-6)
Elective Courses	9	Credits
Complete at least 9 credits of the following courses.		
080103012 Reading I		3(3-0-6)

080103016	English Conversation I	3(3-0-6)
080103017	English Conversation II	3(3-0-6)
080103018	English for Work	3(3-0-6)

Other subjects can be selected from a list of general education available at KMUTNB.

B. Social Sciences and Humanities **7 Credits**

Elective Courses **7 Credits**

Complete at least 7 credits of the following courses.

080203901	Man and Society	3(3-0-6)
080203903	Social, Economics and Politics Dimension	3(3-0-6)
080203904	Law for Everyday Life	3(3-0-6)
080203905	Economy and Everyday Life	3(3-0-6)
080203906	Business and Everyday Life	3(3-0-6)
080303201	Effective Speech	3(3-0-6)
080303301	Art Appreciation	3(3-0-6)
080303601	Human Relations	3(3-0-6)
080303605	Healthy Life	1(0-2-1)
080303606	Systematic and Creative Thinking	3(3-0-6)

Other subjects can be selected from a list of general education available from the department of social sciences and humanities at KMUTNB.

***3(3-0-6)** means that this subject takes 3 credits. It requires 3 hours of lecture, 0 hour of laboratory, and 6 hours of private study.

C. Science and Mathematics **6 Credits**

Elective Courses **6 Credits**

010123801	Computer in Everyday Life	3(3-0-6)
040113005	Chemistry in Everyday Life	3(3-0-6)
040203110	General Mathematics	3(3-0-6)
040433002	Food in Daily Life	3(3-0-6)
040503001	Statistics in Everyday Life	3(3-0-6)

Other subjects can be selected from a list of general education available from the department of Science and Mathematics at KMUTNB.

D. Physical Education **2 Credits**

Complete at least 2 credits of the following courses.

080303501	Basketball	1(0-2-1)
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080303502	Volleyball	1(0-2-1)
080303503	Badminton	1(0-2-1)
080303504	Dancing	1(0-2-1)
080303505	Table Tennis	1(0-2-1)

Other subjects can be selected from a list of general education available from the department of physical education at KMUTNB.

3.1.3.2 Technical Courses	111	Credits
A. Science Courses	24	Credits
040113001	Chemistry for Engineers	3(3-0-6)
040113002	Chemistry Laboratory for Engineers	1(0-3-1)
040203111	Engineering Mathematics I	3(3-0-6)
040203112	Engineering Mathematics II	3(3-0-6)
040203211	Engineering Mathematics III	3(3-0-6)
040313005	Physics I	3(3-0-6)
040313006	Physics Laboratory I	1(0-2-1)
040313007	Physics II	3(3-0-6)
040313008	Physics Laboratory II	1(0-2-1)
040503011	Statistics for Engineers and Scientists	3(3-0-6)
B. Engineering Core Courses	25	Credits
010113851	Basic Electrical Engineering	3(3-0-6)
010113852	Basic Electrical Laboratory	1(0-3-1)
010403001	Engineering Drawing	3(2-2-5)
010403002	Engineering Materials	3(3-0-6)
010403003	Engineering Statics	3(3-0-6)
010403004	Computer Programming	3(2-2-5)
010623001	Thermodynamics of Materials	3(3-0-6)
010623002	Mechanics of Materials	3(3-0-6)
010623003	Transport Phenomena in Materials Processing	3(3-0-6)
C. Material Engineering Courses	38	Credits
Compulsory Courses	29	Credits
010623302	Materials Selection	3(3-0-6)
010623303	Physical Chemistry of Materials	3(3-0-6)
010623304	Mechanical Behavior of Materials	3(3-0-6)
010623305	Materials Testing Laboratory	1(0-2-1)

010623306	Materials Electrochemistry	3(3-0-6)
010623307	Chemical Degradation of Materials	3(3-0-6)
010623308	Failure Analysis of Materials	3(3-0-6)
010623312	Materials Engineering Project I	1(0-2-1)
010623313	Materials Engineering Project II	3(0-6-3)
010623323	Materials Characterization	3(3-0-6)
010623324	Metal Forming	3(3-0-6)

Elective Courses **9 Credits**

Complete at least 9 credits of the following courses.

010623301	Problem Solving Skills and Research Methodology in Materials Engineering	1(0-3-1)
010623309	Quality Control and Management	3(3-0-6)
010623310	Engineering Economy	3(3-0-6)
010623311	Materials Engineering Seminar	1(0-2-1)
010623314	Analytical Methods for Materials Engineering	3(3-0-6)
010623315	Numerical Methods for Materials Engineering	3(3-0-6)
010623316	Phase Transformation	3(3-0-6)
010623317	Surface Engineering	3(3-0-6)
010623318	Non-Destructive Testing	3(3-0-6)
010623319	Tribology	3(3-0-6)
010623320	Safety in Materials Engineering	3(3-0-6)
010623321	Energy and Environment in Materials Engineering	3(3-0-6)
010623322	Special Topic in Materials Engineering	3(3-0-6)

D. Professional Electives **24 Credits**

- Metallurgical Engineering Professional Electives **24 Credits**

Compulsory Courses **17 Credits**

010623401	Metallurgy and Thermal Processing	3(3-0-6)
010623402	Metallurgy and Thermal Processing Laboratory	1(0-2-1)
010623403	Non-Metallic Materials	3(3-0-6)
010623404	Extractive Metallurgy	3(3-0-6)
010623405	Foundry Engineering	3(3-0-6)
010623406	Foundry Engineering Laboratory	1(0-2-1)
010623407	Welding Metallurgy	3(3-0-6)

Elective Courses **7 Credits**

Complete at least 7 credits of the following courses.

010623408	Metal Forming Processes Laboratory	1(0-2-1)
010623409	Iron and Steel Making	3(3-0-6)
010623410	Solidification Processing	3(3-0-6)
010623411	Advanced Foundry Engineering	3(3-0-6)
010623412	Advanced Foundry Engineering Laboratory	1(0-2-1)
010623413	Heat Treatment of Metals	3(3-0-6)
010623414	Laboratory on Heat Treatment of Metals	1(0-2-1)
010623415	Powder Metallurgy	3(3-0-6)
010623416	Electroplating	3(3-0-6)
010623417	Corrosion of Metals	3(3-0-6)
010623418	Cathodic Corrosion Protection	3(3-0-6)
010623419	Stainless Steel	3(3-0-6)
010623420	High-Temperature Materials	3(3-0-6)
010623421	Aluminium Processing Technology	3(3-0-6)
010623422	Special Topic in Metallurgical Engineering	3(3-0-6)
010623423	High Temperature Corrosion and Protection of Metals	3(3-0-6)

E. Industrial Training **240 hours**

010623201	Industrial Training	0(0-240-0)
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3.1.3.3 Free Electives **6 Credits**

Completed at least 6 credits in courses selected from any subjects available at KMUTNB.

3.1.4 Studying Program

Year 1 , 1st Semester

Code	Name of Courses	Credit
010403004	Computer Programming	3(2-2-5)
040113001	Chemistry for Engineers	3(3-0-6)
040113002	Chemistry Laboratory for Engineers	1(0-3-1)
040203111	Engineering Mathematics I	3(3-0-6)
040313005	Physics I	3(3-0-6)
040313006	Physics Laboratory I	1(0-2-1)
080103001	English I	3(3-0-6)
0803xxxxx	Physical Education Elective Course	1(x-x-x)
xxxxxxxxx	Sciences and Mathematics Elective Course	<u>3(x-x-x)</u>

Credit 21(x-x-x)

Year 1 , 2nd Semester

Code	Name of Courses	Credit
010403001	Engineering Drawing	3(2-2-5)
010403002	Engineering Materials	3(3-0-6)
040203112	Engineering Mathematics II	3(3-0-6)
040313007	Physics II	3(3-0-6)
040313008	Physics Laboratory II	1(0-2-1)
040xxxxxx	Sciences and Mathematics Elective Course	3(x-x-x)
080103002	English II	3(3-0-6)
080xxxxxx	Social Sciences and Humanities Elective Course	1(x-x-x)
		Credit <u>20(x-x-x)</u>

Year 2 , 1st Semester

Code	Name of Courses	Credit
010403003	Engineering Statics	3(3-0-6)
010623001	Thermodynamics of Materials	3(3-0-6)
040203211	Engineering Mathematics III	3(3-0-6)
040503011	Statistics for Engineers and Scientists	3(3-0-6)
0801xxxxx	Language Elective Course	3(x-x-x)
0803xxxxx	Physical Education Elective Course	1(x-x-x)
080xxxxxx	Social Sciences and Humanities Elective Course	<u>3(x-x-x)</u>
		Credit <u>19(x-x-x)</u>

Year 2 , 2nd Semester

Code	Name of Courses	Credit
010113851	Basic Electrical Engineering	3(3-0-6)
010113852	Basic Electrical Laboratory	1(0-3-1)
010623002	Mechanics of Materials	3(3-0-6)
010623303	Physical Chemistry of Materials	3(3-0-6)
010623401	Metallurgy and Thermal Processing	3(3-0-6)
010623402	Metallurgy and Thermal Processing Laboratory	1(0-2-1)
010623403	Non-Metallic Materials	3(3-0-6)
0801xxxxx	Language Elective Course	<u>3(x-x-x)</u>
		Credit <u>20(x-x-x)</u>

Year 3 , 1st Semester

Code	Name of Courses	Credit
010623003	Transport Phenomena in Materials Processing	3(3-0-6)
010623304	Mechanical Behavior of Materials	3(3-0-6)
010623305	Materials Testing Laboratory	1(0-2-1)
010623404	Extractive Metallurgy	3(3-0-6)
010623405	Foundry Engineering	3(3-0-6)
010623406	Foundry Engineering Laboratory	1(0-2-1)
010623407	Welding Metallurgy	3(3-0-6)
0106xxxxx	Technical Elective Course	<u>3(x-x-x)</u>
	Credit	<u>20(x-x-x)</u>

Year 3 , 2nd Semester

Code	Name of Courses	Credit
010623306	Materials Electrochemistry	3(3-0-6)
010623307	Chemical Degradation of Materials	3(3-0-6)
010623323	Materials Characterization	3(3-0-6)
010623324	Metal Forming	3(3-0-6)
01062xxxx	Special Elective Course	1(0-2-1)
0106xxxxx	Technical Elective Course	3(x-x-x)
0801xxxxx	Language Elective Course	<u>3(x-x-x)</u>
	Credit	<u>19(x-x-x)</u>

Year 3 , 3rd Summer

010623201	Industrial Training	0(0-240-0)
	Credit	<u>0(0-240-0)</u>

Year 4 , 1st Semester

Code	Name of Courses	Credit
010623302	Materials Selection	3(3-0-6)
010623308	Failure Analysis of Materials	3(3-0-6)
010623312	Materials Engineering Project I	1(0-2-1)
0106xxxxx	Special Elective Course	3(x-x-x)
080xxxxxx	Social Sciences and Humanities Elective Course	3(x-x-x)
xxxxxxx	Free Elective Course	<u>3(x-x-x)</u>

Credit 16(x-x-x)Year 4 , 2nd Semester

Code	Name of Courses	Credit
010623313	Materials Engineering Project II	3(0-6-3)
0106xxxxx	Special Elective Course	3(x-x-x)
0106xxxxx	Technical Elective Course	3(x-x-x)
xxxxxxxxx	Free Elective Course	<u>3(x-x-x)</u>

Credit 12(x-x-x)