Academic HANDBOOK

UNIVERSITI TEKNIKAL MALAYSIA MELAKA
SESSION 2019 / 2020

FACULTY OF MECHANICAL AND MANUFACTURING ENGINEERING TECHNOLOGY (FTKMP)

(TECHNOLOGY PROGRAMME)

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ACADEMIC HANDBOOK SESSION 2019/2020

Faculty of Mechanical and Manufacturing Engineering Technology (FTKMP)

Technology Programme

FIRST PUBLISHED 2019

Published and Printed in Malaysia by:
Penerbit Universiti
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ASSOC. PROF. DR. NURULFAJAR BIN ABD MANAP
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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

UTeM VISION

To Be One of the World's Leading Innovative and Creative Technical Universities.

UTeM MISSION

UTeM determined to lead and contribute to the wellbeing of the country and the world by:
- Promoting Knowledge Through Innovative Teaching & Learning, Research and Technical Scholarship.
- Developing Professional Leaders with Impeccable Moral Values.
- Generating Sustainable Development Through Smart Partnership with the Community and Industry.

UTeM MOTTO

Excellence Through Competency

UTeM GENERAL EDUCATION GOALS

1. To conduct academic and professional programmes based on relevant needs of the industries.
2. To produce graduates with relevant knowledge, technical competency, soft skills, social responsibility and accountability.
3. To cultivate scientific method, critical thinking, creative and innovative problem solving and autonomy in decision making amongst graduates.
4. To foster development and innovation activities in collaboration with industries for the prosperity of the nation.
5. To equip graduates with leadership and teamwork skills as well as develop communication and life-long learning skills.
6. To develop technopreneurship and managerial skills amongst graduates.
7. To instill an appreciation of the arts and cultural values and awareness of healthy life styles amongst graduates.

DEAN'S FOREWORD

On behalf of the faculty, I would like to welcome all first year Bachelor of Mechanical Engineering Technology, Bachelor of Manufacturing Engineering Technology and Bachelor of Technology students to the Faculty of Mechanical and Manufacturing Engineering Technology (FTKMP).

FTKMP was established on 1 July 2018 after the Faculty of Engineering Technology (established on 11 April 2011) was divided into two new faculties. The Faculty consists of the Department of Mechanical Engineering Technology (JTKM), Department of Manufacturing Engineering Technology (JTKP), and the new one is the Department of Industry Technology (JTI). Currently, there are about 154 staff and 1550 students in the Faculty.

Our extensive and diverse range of undergraduate programmes cover nine full-time degree programmes. The programmes provide hands-on (practical-oriented) teaching and learning experience to the students, in addition to the theory given during lectures. It is our aim that you will be able to develop equipment handling and problem-solving skills in accordance with industrial needs. This will ensure you are ready for a career in selected technological field.

Finally, I hope that you will take this opportunity to obtain a strong technological foundation and become competent in solving mechanical and manufacturing engineering technology related problems.

I wish you success in your studies and in your future endeavours.

Thank you and Wassalam.

ASSOC. PROF. TS. DR UMAR AL-AMANI BIN HAJI AZLAN
Dean
Faculty of Mechanical and Manufacturing Engineering Technology

FTKMP VISION

Internationally Referred In Mechanical And Manufacturing Engineering Technology Programme.

FTKMP MISSION

To Advance Knowledge And Skill In Mechanical And Manufacturing Engineering Technology Excellence That Will Best Serve The Nation.

FTKMP MOTO

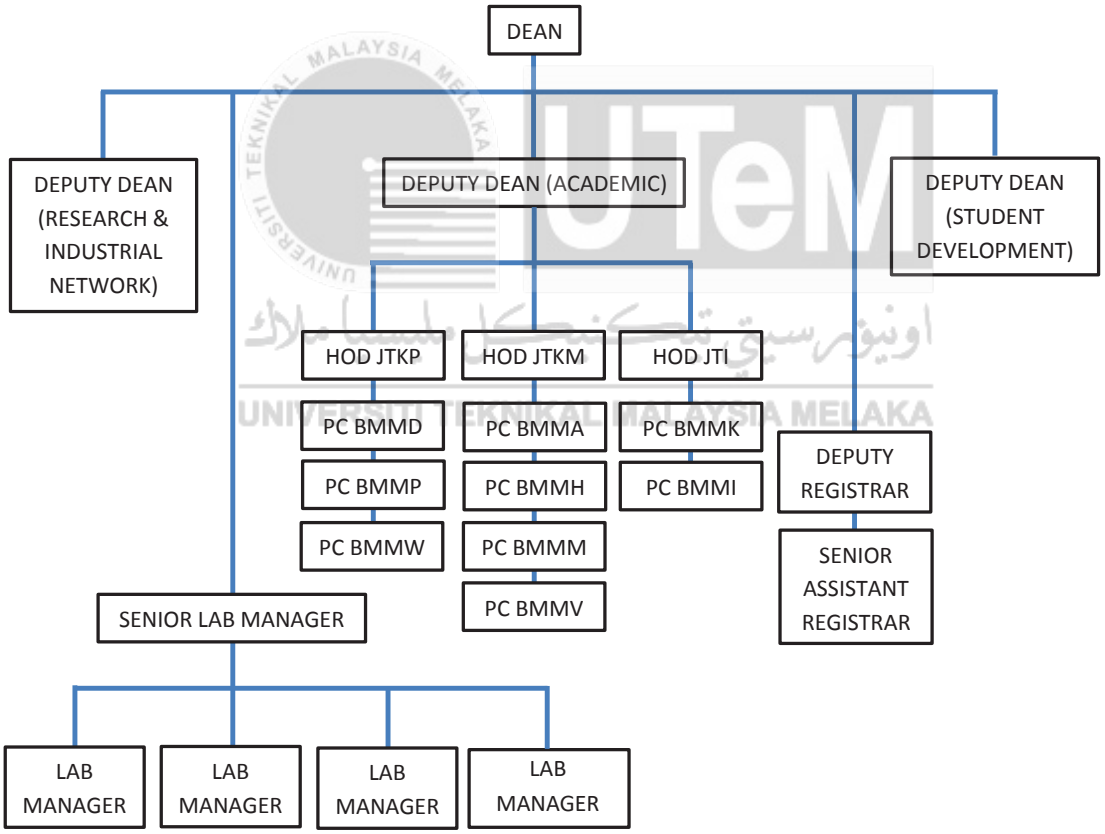
Home Of Engineering Technology.

FTKMP OBJECTIVES

- To provide high quality and demanding engineering technology programme that meet current need of industry and society.
- To produce highly skilled and competence workforce that is recognized by professional bodies nationally and internationally.
- To implement modern and innovative approaches in our teaching and learning environment.
- To establish network, good relationship and collaboration with universities and industries.
- To participate in activities that supports the intellectual and economic development of business, industry, government and stakeholders.

FTKMP ORGANIZATION CHART

The faculty is headed by a Dean, assisted by three Deputy Deans, each responsible for Academic, Research & Industrial Network and Students Development, respectively. Head of Departments (HOD) and Program Coordinators (PC) manage the degree programs. Senior lab manager, lab managers and deputy lab manager manage the laboratories facilities and assistant engineers. Deputy Registrar and Senior Assistant Registrar are responsible for the administration of the faculty's office and staff welfare.



PROGRAMMES OFFERED

No	Programme Name	Short Code
1	Bachelor of Technology in Industrial Machining with Honours	BMMI
2	Bachelor of Technology in Welding with Honours	BMMK

PROGRAMME DURATION

The Bachelor's Degree duration is within minimum of 3 and a half years and up to maximum of 6 years.

GRADING SYSTEM

A student's achievement for each course is based on the grades which are illustrated in Table 1.

Table 1: Marks, Grades and Points Awarded

Marks	Grade	Points	Achievements
80 – 100	A	4.0	Distinction
75 – 79	A-	3.7	Distinction
70 – 74	B+	3.3	Merit
65 – 69	B	3.0	Merit
60 – 64	B-	2.7	Merit
55 – 59	C+	2.3	Pass
50 – 54	C	2.0	Pass
47 – 49	C-	1.7	Conditional Pass
44 – 46	D+	1.3	Conditional Pass
40 – 43	D	1.0	Conditional Pass
0 – 39	E	0.0	Fail

ACADEMIC CLASSIFICATION

A student's achievement is evaluated based on Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA). A student's academic status will be provided at the end of each semester based on CGPA as shown in Table 2.

Table 2: Academic Status Classification

STATUS	CGPA
Good (KB)	CGPA ≥ 2.00
Conditional (KS)	1.70 ≤ CGPA < 2.00
Fail (KG)	CGPA < 1.70

(Note: KB = Kedudukan Baik, KS = Kedudukan Bersyarat, KG = Kedudukan Gagal)

ACADEMIC ADVISORY SYSTEM

Students are free to take course offered by the faculty at any semester based on their capability, as long as it complies with the rules and regulations set up by the faculty and university academic board. Students need to plan their own study carefully and the faculty shall appoint an academic advisor to guide them during their duration of study in the university.

Characteristics of the Semester System:

- Students are free to take any course offered in each semester based on their ability; and conditions of course selection are determined by the faculty and university's academics regulations.
- Students should plan their study and learning appropriately or as advised by their academic advisor.

The Importance of Academic Advisor:

- Students need to be guided in term of course taken under the semester system, where they are free to determine the number of course to be taken based on their capability or in case the student obtained a Conditional Position (KS) in the previous semester. They need to plan carefully to take course which are suitable for them to carry and fully aware on its implication to their whole study period in the university.
- Semester system is a flexible system for a student with high, moderate or less capability to complete their study based on their own capability whilst complying with the maximum study period set up by the university.
- The academic advisor is able to provide an advice not only in the academic matter, but also in the aspects of how the students can adapt themselves to the semester system, culture shock of studying in the university, time management and private matters that may affect the students' study performance.
- In the condition where the student is not with the same batch of other students during the study period due to difference in the course taken, difficulty may be expected for him/her to discuss on the matter of study with the others. Thereby, the role of academic advisor is important.

Roles and Responsibilities of student and academic advisor in the Academic Advisory System are as follows:

Academic Advisor	Student
• Conduct a meeting with students at least twice every semester.	• Always be open-minded when meeting with the academic advisor.
• Make sure to student understand the academic system in UTeM.	• Attend meetings conducted by the academic advisor.
• Guide and make sure student's course registration is based on his/her current academic result.	• Regard the academic advisor as a mentor and seek advice on the academic matters from them.
• Supervise the student study progress and provide guidance in making a good study planning.	• Learn to have a good understanding of the academic system.
• Inspire students so that they will always be motivated in their study.	• Provide a copy of examination result to the academic advisor for each semester.
• Ensure the student's record and file is always updated – make sure no course is missed to fulfill the requirement for the award of a Bachelor's Degree.	• Get the certification of registration form, copy of certificates and reference letter from the academic advisor.
• Refer the student to certain department/centre for further action if necessary.	• Keep records on all courses that have already been taken during the period of study to prevent missed course and fulfill the requirement for degree award.

GPA & CGPA CALCULATION

A student's overall achievement is based on Grade Point Average (GPA) obtained for a particular semester and Cumulative Grade Point Average (CGPA) for the semesters that have been completed.

Grade Point Average (GPA):

GPA is the grade point average obtained in a particular semester. It is based on the following calculations:

Total Points, JMN = k1m1 + k2m2 + ...knmn

Total Calculated Credits, JKK = k1 + k2 + ...kn

GPA = JMN / JKK
= [k1m1 + k2m2 + ...knmn] / [k1 + k2 + ...kn]

Where : kn = Credit for n course
mn = Points

Cumulative Grade Point Average (CGPA):

CGPA is the cumulative grade point average obtained for the semesters that have been completed. It is based on the following calculations:

CGPA = [JMN1 + JMN2 + ...JMNn] / [JKK1 + JKK2 + ...JKKn]

Where: JMNn = Total points obtained in n semester
JKKn = Total credits in n semester

AWARD

A Bachelor's Degree shall be awarded if all the following conditions are fulfilled by the student:

1. Must get Good Status (KB) in the final semester and ended up with KBA status.
2. Pass all the courses required as listed in the programme curriculum.
3. Apply for the award of the degree, approved by faculty and certified by university senate.
4. Meet all the other requirements set by the university.
5. Students do not have any debt with the university.

CURRICULUM STRUCTURES

BACHELOR OF TECHNOLOGY IN INDUSTRIAL MACHINING WITH HONOURS

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

Programme Educational Objectives (PEO) is specific goals describing expected achievements of graduates in their career and professional life after graduation.

PEO1	To produce machining technologist that perform related work including machinist, designer, manufacturer, maintenance, facility manager and production manager.
PEO2	To produce technopreneurs in machining related technology.
PEO3	To produce relevant, respected and referred professionals in machining technology.

PROGRAMME OUTCOMES (PO)

Programme Outcomes (PO) are statements describing what students are expected to know and be able to perform or attain by the time of graduation. These relate to the skills, knowledge, and behaviours that students acquire through their programme of studies.

PO1	Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in industrial machining.
PO2	Able to suggest and apply latest tools and techniques to solve broadly-defined problems.
PO3	Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in industrial machining.
PO4	Able to communicate and articulate effectively in both verbal and written among technologist communities and society at large.
PO5	Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices.
PO6	Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.
PO7	Demonstrate an awareness of management and technopreneurship practices in real perspective.
PO8	Demonstrate professionalism and social and ethical consideration.
PO9	Demonstrate leadership quality, mentoring and work effectively in diverse teams.

BACHELOR OF TECHNOLOGY IN WELDING WITH HONOURS

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

Programme Educational Objectives (PEO) is specific goals describing expected achievements of graduates in their career and professional life after graduation.

PEO1	To produce welding technologist that perform related welding work including maintenance, fabricator, designer, safety advisor and production manager.
PEO2	To produce technopreneurs in related welding technology.
PEO3	To produce relevant, respected and referred professionals in welding technology.

PROGRAMME OUTCOMES (PO)

Programme Outcomes (PO) are statements describing what students are expected to know and be able to perform or attain by the time of graduation. These relate to the skills, knowledge, and behaviours that students acquire through their programme of studies.

PO1	Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in welding technology.
PO2	Able to suggest and apply latest tools and techniques to solve broadly-defined problems.
PO3	Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in welding technology.
PO4	Able to communicate and articulate effectively in both verbal and written among technologist communities and society at large.
PO5	Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices.
PO6	Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.
PO7	Demonstrate an awareness of management and technopreneurship practices in real perspective.
PO8	Demonstrate professionalism and social and ethical consideration.
PO9	Demonstrate leadership quality, mentoring and work effectively in diverse teams.

Bachelor of Technology in Industrial Machining with Honours (BMMI)

	CODE	COURSE	CATEGORY	CREDIT	PRERE-QUISITE
SEMESTER 1	BKKX XXX1	Kokurikulum I *Cocurriculum I*	General	1	
	BLHW 1442	Bahasa Inggeris untuk Tujuan Akademik *English for Academic Purpose*	General	2	
	BLHL 1212	Bahasa Ketiga *Third Language*	General	2	
	BMMI 1013	Draf Produk dan Spesifikasi *Product Drafting and Specification*	Technology	3	
	BMMI 1023	Ketepatan Piawai Produk *Standard Product Precision*	Technology	3	
	BMMI 1033	Sifat Bahan Kerja dan Perkakas Pemotong *Workpiece and Cutting Tool Properties*	Technology	3	
	BMMI 1043	Jig dan Lekapan *Jig and Fixture*	Technology	3	
TOTAL CREDITS THIS SEMESTER				**17**	
SEMESTER 2	BKKX XXX1	Kokurikulum II *Cocurriculum II*	General	1	
	BLHW 2452	Penulisan Akademik *Academic writing*	General	2	BLHW 1442
	BTMW 1112	Asas Keusahawanan *Basic Entrepreneurship*	General	2	
	BMMI 1054	Pemasangan dan Baikpulih Perkakas *Tool Setup and Refurbishment*	Technology	4	
	BMMI 1063	Kelestarian Pemesinan *Sustainable Machining*	Technology	3	
	BMMI 1073	Pemantauan Keadaan dalam Pemesinan *Condition Monitoring in Machining*	Technology	3	
	BMMI 1083	Penilaian Kebolehmesinan *Assesment of Machinability*	Technology	3	
TOTAL CREDITS THIS SEMESTER				**18**	

	CODE	COURSE	CATEGORY	CREDIT	PRERE-QUISITE
SEMESTER 3	BLHW 3462	Bahasa Inggeris untuk Interaksi Profesional *English for Professional Interaction*	General	2	BLHW 2452
	BLHX XXX2	Penghayatan Etika dan Peradaban	General	2	
	BMMI 2094	Ketepatan dan Kemasan dalam Teknologi CNC *Precision and Finising in CNC Technology*	Technology	4	
	BMMI 2103	Ketepatan dan Kemasan dalam Teknologi EDM and Pengisaran *Precision and Finising in EDM and Grinding Technology*	Technology	3	
	BMMI 2114	Produk CADCAM Prismatik *Prismatic CADCAM Product*	Technology	4	
TOTAL CREDITS THIS SEMESTER				**17**	
SEMESTER 4	BTMU 2124	Capstone Teknokeusahawanan 1 *Capstone Technopreneurship 1*	General	4	
	BMMI 2123	Pemesinan Pelbagai Paksi *Multi Axis Machining*	Technology	3	
	BMMI 2134	Produk CADCAM Kompleks *Complex CADCAM Product*	Technology	4	
	BMMI 2143	Rawatan Haba dalam Komponen Termesin *Heat Treatment of Machined Component*	Technology	3	
	BMMI 2154	Kaedah Pemasangan *Assembly Method*	Technology	4	
TOTAL CREDITS THIS SEMESTER				**18**	

	CODE	COURSE	CATEGORY	CREDIT	PRERE-QUISITE
SEMESTER 5	BLHX XXX2	Falsafah dan Isu Semasa	General	2	
	BTMU 3134	Capstone Teknokeusahawanan 2 *Capstone Technopreneurship 2*	General	4	
	*BMMI 3XX4	Elektif *Elective*	Elective	4	
	BMMI 3214	Kerja dan Pemulihan Komponen Termesin *Rework and Rehabilation of Machined*	Technology	4	
	BMMI 3224	Estetika Permukaan untuk Komponen Termesin *Surface Aesthetics of Machined Component*	Technology	4	
TOTAL CREDITS THIS SEMESTER				**18**	
SEMESTER 6	BMMI 3234	Penyelenggaraan Mesin *Machine Maintenance*	Technology	4	
	BMMI 3244	Pengurusan Projek dan Penyeliaan *Project Management and Supervision*	Technology	4	
	BMMI 3254	Akta dan Penilaian Risiko dan Pengeluaran Pemesinan *Acts and Risks Assesment in Machining Production*	Technology	4	
	BMMU 3134	Projek Tahun Akhir 1 *Final Year Project 1*	Technology	4	
TOTAL CREDITS THIS SEMESTER				**16**	

	CODE	COURSE	CATEGORY	CREDIT	PRERE-QUISITE
SEMESTER PENDEK	BMMU 3186	Projek Tahun Akhir 2 *Final Year Project 2*	Technology	6	
TOTAL CREDITS THIS SEMESTER				**6**	
SEMESTER 7	BMMU 3212	Latihan Industri *Industrial Training*	Technology	12	
TOTAL CREDITS THIS SEMESTER				**12**	
TOTAL CREDITS				**120**	

* For Elective, students may choose any ONE (1) COURSE from the list below:

NO.	CODE	COURSE NAME
1	BMMI 3164	Pembuatan Perkakas dan Dai *Tool and Die Making*
2	BMMI 3174	Pemesinan Pantas *Rapid Machining*
3	BMMI 3184	Pemesinan Aeroangkasa *Aerospace Machining*
4	BMMI 3194	Faktor Teknologi Kemanusiaan *Human Factor Technology*
5	BMMI 3204	Perancangan dalam Pengeluaran Pemesinan *Production Planning in Machining*

Bachelor of Technology in Welding with Honours (BMMK)

	CODE	COURSE	CATEGORY	CREDIT	PRERE-QUISITE
SEMESTER 1	BKKX XXX1	Kokurikulum I *Cocurriculum I*	General	1	
	BLHW 1442	Bahasa Inggeris untuk Akademik *English for Academic Purposes*	General	2	
	BLHL 1212	Bahasa Ketiga *Third Language*	General	2	
	BMMK 1014	Keselamatan dalam Kimpalan *Safety in Welding*	Technology	4	
	BMMK 1024	Cad dan Grafik Kimpalan *Cad and Welding Graphics*	Technology	4	
	BMMK 1034	Teknologi Fabrikasi Logam *Metal Fabrications Technology*	Technology	4	
TOTAL CREDITS THIS SEMESTER				**17**	
SEMESTER 2	BKKX XXX1	Kokurikulum II *Cocurriculum II*	General	1	
	BLHW 2452	Penulisan Akademik *Academic writing*	General	2	BLHW 1442
	BLHX XXX2	Penghayatan Etika dan Peradaban	General	2	
	BTMW 1112	Asas Keusahawanan *Basic Entrepreneurship*	General	2	
	BMMK 1043	Rekabentuk Produk dalam Kimpalan *Product Design in Welding*	Technology	3	
	BMMK 1054	Dokumentasi Kimpalan *Welding Documentations*	Technology	4	
	BMMK 1064	Proses Kimpalan Bukan Konvensional *Non-Conventional Welding Process*	Technology	4	
TOTAL CREDITS THIS SEMESTER				**18**	

	CODE	COURSE	CATEGORY	CREDIT	PRERE-QUISITE
SEMESTER 3	BLHW 3462	Bahasa Inggeris untuk Interaksi Profesional *English for Professional Interaction*	General	2	BLHW 2452
	BMMK 2074	Pengujian dan Ketidaksempurnaan dalam Kimpalan *Imperfection in Welding and Testing*	Technology	4	
	BMMK 2084	Tingkahlaku Bahan dalam Kimpalan *Materials Behaviour in Welding*	Technology	4	
	BMMK 2094	Pengurusan Keselamatan *Safety Management*	Technology	4	
	BMMK 2104	Analisis Rekabentuk Kimpalan *Welding Design Analysis*	Technology	4	
TOTAL CREDITS THIS SEMESTER				**18**	
SEMESTER 4	BLHX XXX2	Falsafah dan Isu Semasa	General	2	
	BTMU 2124	Capstone Teknokeusahawanan 1 *Capstone Technopreneurship 1*	General	4	
	BMMK 2114	Analisis Berbantu Komputer *Computer Aided Analysis*	Technology	4	
	BMMK 2124	Peralatan Kimpalan Elektrik *Electrical Welding Equipment*	Technology	4	
	BMMK 2134	Ujian Tanpa Musnah *Non Destructive Test*	Technology	4	
TOTAL CREDITS THIS SEMESTER				**18**	

	CODE	COURSE	CATEGORY	CREDIT	PRERE-QUISITE
SEMESTER 5	BTMU 3134	Capstone Teknokeusahawanan 2 *Capstone Technopreneurship 2*	General	4	
	*BMMK 31X4	Elektif *Elective*	Elective	4	
	BMMK 3144	Ekonomi Kimpalan dan Perolehan *Economic of Welding and Procurement*	Technology	4	
	BMMK 3184	Jaminan Kualiti Kimpalan *Welding Quality Assurance*	Technology	4	
TOTAL CREDITS THIS SEMESTER				**16**	
SEMESTER 6	BMMU 3134	Projek Tahun Akhir 1 *Final Year Project 1*	Technology	4	
	BMMK 3193	Sistem Fizikal Siber dalam Kimpalan *Cyber Physical Systems in Welding*	Technology	3	
	BMMK 3204	Pemulihan dalam Kimpalan *Reclaimination in Welding*	Technology	4	
	BMMK 3214	Pengurusan Pengeluaran dan Pengawasan *Managing Production and Supervision*	Technology	4	
TOTAL CREDITS THIS SEMESTER				**15**	

	CODE	COURSE	CATEGORY	CREDIT	PRERE-QUISITE
SEMESTER PENDEK	BMMU 3186	Projek Tahun Akhir 2 *Final Year Project 2*	Technology	6	
TOTAL CREDITS THIS SEMESTER				**6**	
SEMESTER 7	BMMU 3212	Latihan Industri *Industrial Training*	Technology	12	
TOTAL CREDITS THIS SEMESTER				**12**	
TOTAL CREDITS				**120**	

* For Elective, students may choose any ONE (1) COURSE from the list below:

NO.	CODE	COURSE NAME
1.	BMMK 3154	Ujian Tanpa Musnah untuk Profesional *Non Dectructive Test for Professional*
2.	BMMK 3164	Teknologi Kimpalan untuk Profesional *Welding Technology for Professional*
3.	BMMK 3174	Pemeriksaan Kimpalan untuk Profesional *Welding Inspection for Professional*

UTeM
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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

SUMMARY OF COURSES

General Courses

BKKX XXX1
COCURRICULUM I & COCURRICULUM II /
KOKURIKULUM I & KOKURIKULUM II

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Apply skills in relevant fields.
2. Demonstrate teamwork abilities in related courses.

SYNOPSIS

1. **Cultural**
   Choir, Gamelan, Cak Lempung, Nasyid, Seni Khat, Seni Lakon, Art, English Elocution, Bahasa Melayu Elocution, and Kompang.
2. **Entrepreneurship**
   Video, Film and Photography, Publishing & Journalism, Computer and Technopreneurship.
3. **Society**
   Fiqh Muamalat, Fiqh Amali, Tahsin Al-Quran & Yaasin and Peer Program.
4. **Recreation**
   Go-Kart, Adventure and Cycling.
5. **Sports**
   Swimming, Volley Ball, Golf, Kayaking, Takraw, Aerobic, Badminton, Football and Net ball.
6. **Martial Arts**
   Silat Gayong, Karate-Do and Taekwando.

BKKX XXX1
COCURRICULUM I & COCURRICULUM II /
KOKURIKULUM I & KOKURIKULUM II

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Apply skills in relevant fields.
2. Demonstrate teamwork abilities in related courses.

SYNOPSIS

1. **Cultural**
   Choir, Gamelan, Cak Lempung, Nasyid, Seni Khat, Seni Lakon, Art, English Elocution, Bahasa Melayu Elocution, and Kompang.
2. **Entrepreneurship**
   Video, Film and Photography, Publishing & Journalism, Computer and Technopreneurship.
3. **Society**
   Fiqh Muamalat, Fiqh Amali, Tahsin Al-Quran & Yaasin and Peer Program.
4. **Recreation**
   Go-Kart, Adventure and Cycling.
5. **Sports**
   Swimming, Volley Ball, Golf, Kayaking, Takraw, Aerobic, Badminton, Football and Net ball.
6. **Martial Arts**
   Silat Gayong, Karate-Do and Taekwando.

BLHW 1442
ENGLISH FOR ACADEMIC PURPOSES /
BAHASA INGGERIS UNTUK AKADEMIK

LEARNING OUTCOMES

By the end of the course, students should be able to:

1. Apply correct grammar rules according to context.
2. Demonstrate knowledge of various reading skills in the reading tasks given.

SYNOPSIS

This course aims to develop students' reading skills and grammar. A variety of academic reading texts and reading skills are explored to facilitate students' comprehension of the texts. These reading skills are also necessary in assisting students to master study skills. Grammar elements are taught in context to develop students' accuracy in the use of the language. This course also includes elements of blended learning.

REFERENCES

1. De Chazal, E., & Rogers, L. (2013). *Oxford EAP: A course in English for Academic Purposes*. Oxford: Oxford University Press.
2. McDonald, A. & Hancock, M. (2010). *English result*. Oxford: Oxford University Press.
3. Paterson, K. & Wedge, R. (2013). *Oxford grammar for EAP*. Oxford: Oxford University Press.

BLHW 2452
ACADEMIC WRITING /
PENULISAN AKADEMIK

LEARNING OUTCOMES

At the end of the course, students should be able to:

1. Prepare clear and detailed descriptions of a product related to fields of interest.
2. Express arguments systematically in a composition.
3. Prepare short reviews of technical materials.

SYNOPSIS

This course aims to equip the students with the skills to communicate clear and detailed viewpoints in writing. The students are expected to have a stand on topics of their fields by providing advantages and disadvantages to support their arguments. From time to time, consultations with the students will be conducted throughout the completion of their assignments. This serves as the formative evaluation in the course. Grammar components are embedded in the course to support the required writing skills. Blended learning is incorporated in this course.

REFERENCES

1. Chazal, E.d. & Rogers, L. (2012). Oxford EAP: A course in English for Academic Purposes. New York: Oxford University Press.
2. Hancock, M. & McDonald, A. (2010). English Result Upper-intermediate. New York: Oxford University Press.
3. Paterson, K. & Wedge, R. (2013). Oxford Grammar for EAP. UK: Oxford University Press.

PRE-REQUISITE

BLHW 1442
ENGLISH FOR ACADEMIC PURPOSES / BAHASA INGGERIS UNTUK AKADEMIK

BLHW 3462
ENGLISH FOR PROFESSIONAL INTERACTION /
BAHASA INGGERIS UNTUK INTERAKSI PROFESIONAL

LEARNING OUTCOMES

At the end of the course, students should be able to:

1. Listen and infer based on situations in context.
2. Respond to standard spoken language using communication strategies.
3. Display detailed descriptions by expanding and supporting points of view using relevant examples.

SYNOPSIS

This course which is designed based on a blended and student-centred learning approach aims to develop students' listening skills as well as communication skills and strategies. Among the elements covered are professional interactions that include group discussion and public speaking. Students are also required to express ideas with relevant examples in public speaking and online assessments. They are also exposed to the rudiments of grammar implicitly via the communicative activities.

REFERENCES

1. Fry, R. (2016). 101 smart questions to ask on your interview. U.K.: New Page Books.
2. Cooper, S. (2016). 100 tricks to appear smart in meetings: How to get by without even trying. Andrews McMeel Publishing.
3. Hood, J.H. (2013). How to book of meetings: A complete guide for every business. South Australia: Magill.
4. Carmine, G. (2014). Talk like TED: The 9 public-speaking secret of the world's top minds. New York: St Martins Press.
5. Jason, S.W. (2013). Workplace communication for the 21st century: Tools and strategies that impact the bottom line. California: Praeger.

PRE-REQUISITE

BLHW 2452
ACADEMIC WRITING / PENULISAN AKADEMIK

BMMI Technology Course

BMMI 1013
PRODUCT DRAFTING AND SPECIFICATION / DRAF PRODUK DAN SPESIFIKASI

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Examine, analyse, interpret and assess the engineering drawing (PLO1, C3)
2. Deliver information via the set of drawings from engineering parts.
3. Draft the product to be machined according to the standard of engineering drawing.

SYNOPSIS

This subject teaches students the principle drafting specification. students learn about topics like geometrics, sectional views and multi-view drawing. Students also study lettering, tolerance and dimensioning. students learn how to draft assembly drawings. They also learn how to interpret drawings.

REFERENCES

1. Mechanical Drawing Board & CAD Techniques, Student Edition, McGraw-Hill Education, 2013
2. Giesecke, F. E., Mitchell, A., Spencer, H. C., Hill, I. L., Dygdon, J. T. and Novak, J. E.,Lockhart S., 2016, Technical Drawing With Engineering Graphics, 15th Ed., Pearson & Prentice Hall, New Jersey.
3. Cheryl R. Shrock And Steve Heather, 2015, Beginning Autocad 2015, Industrial Press, Inc.

BMMI 1023
STANDARD PRODUCT PRECISION / KETEPATAN PIAWAI PRODUK

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Conduct the basic quality principles and practices, quality solving techniques and product reliability related to manufacturing process
2. Perform suitable measurement methods for a given issue
3. Solve the manufacturing process quality problem using quality solving techniques as individual or groupwork.

SYNOPSIS

This course covers three main areas; dimensional metrology, measurement analysis, and surface/texture measurement. In the dimensional metrology, students will be expose to three types of measurements; linear, angle and geometrical. . In the measurements analysis, students will be required to describe the standard Measurement, measurement process, process capability, measurement errors, limits, tolerances and fits. In surface/texture measurement, students will perform the measurement of surface texture. This subject equivalent to Geometric, Dimensioning and Tolerance in other technological fields.

REFERENCES

1. Bucher, J.L (2014).The Metrology Handbook. ASQ Quality Press.
2. Campbell, R.G and Roth, E.S (2012).Integrated Product Design and Manufacturing Using Geometrical Dimensioning and Tolerancing. Marcel Dekker, Inc.
3. Besterfield, D. H. (2014) Quality Control, 8th Edition, Pearson.
4. Montgomery D. C., (2005) Introduction to Statistical Quality Control, 5th Edition, John Wiley and Sons, Inc.
5. Bass, I (2014) Six Sigma Statisctic with Excel and Minitab, Mc Graw Hill.

BMMI 1033
WORKPIECE AND CUTTIING TOOL PROPERTIES /
SIFAT BAHAN KERJA DAN PERKAKAS PEMOTONG

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Recognize the common cutting tools and workpiece material tha tbeing applied in the automotive, aerospace and medical industries
2. Manufacture cutting tool and/or workpiece material from powder metaalurgy and casting process
3. Relate the usage of cutting tools and workpiece materials in the specifIc application in industry

SYNOPSIS

This course covers types, setup, applications and specifications of common cutting tools and workpiece materials that frequently applied in industry. The course also introduces why the selection of the appropriate cutting tools and cutting fluids are essential in metal cutting operations to reduce the heat and friction produced during material removal operations and how the selection, setup and applications affect the quality, accuracy, efficiency and productivity of the workpiece produced.

REFERENCES

1. Erik Oberg, Franklin Jones, Holbrook Horton, Henry Ryffel, Christopher McCauley, (2016) 30th Edition, Machinery's Handbook, Industrial Press
2. Winston A. Knight, Geoffrey Boothroyd, (2005) 3rd Edition, Fundamentals of Metal Machining and Machine Tools, Taylor & Francis J. Paulo Davim, (2014) 1st Edition, Machinability of Advanced Materials, Wiley
3. J. Paulo Davim, (2011) 1st Edition, Machining of Hard Materials, Springer
4. A Mouritz, (2012) 1st Edition, Introduction to Aerospace Materials, Woodhead Publishing

BMMI 1043
JIG AND FIXTURE/
JIG DAN LEKAPAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Recognize difference type of jigs and fixtures, materials used, actuation method, components of jigs and fixtures
2. Perform to fabricate componet for jig and fixture with the specific design and application in manufacturing process
3. Coordinate a task to fabricate jig and fixture assembled ny multicomponents

SYNOPSIS

This subject introduces students to jig and fixture. It starts with types and functions of jig and fixture. In addition, students will be exposed to knowledge about classification of jig and fixture for selected operation. This course also will introduce student to identify the principles and analysis of a tool design in jig and fixture application. In this course, the tool drawing is important to students in order to design the jig and fixture therefore the guideline of tool and jig design are explained.

REFERENCES

1. P. H Joshi (2010). Jig and Fixtures, Third Edition. McGraw Hill Education.
2. Tool and Cutter Sharpening (Workshop Practice), Harold Hall, Special Interest Model Books; UK ed. Edition, 2012.
3. Grover, M.P. (2010). Fundamentals of Modern Manufacturing: Materials, Processes, and Systems, 4th Edition. Wiley

BMMI 1054
TOOL SETUP AND REFURBISHMENT /
ETIKA KEJURUTERAAN & KKPP

LEARNING OUTCOMES

Upon completion of this course, students should be able to:

1. Identify the importance specification of cutting tool design for turning, milling and drilling operations
2. Perform the cutting tool setup for turning, milling and drilling operations.
3. Propose the usage of refurbished cutting tools in machining and other application

SYNOPSIS

This course covers types, setup, applications and specifications of common cutting tools and workpiece materials that frequently applied in industry. The course also introduces why the selection of the appropriate cutting tools and cutting fluids are essential in metal cutting operations to reduce the heat and friction produced during material removal operations and how the selection, setup and applications affect the quality, accuracy, efficiency and productivity of the workpiece produced.

REFERENCES

1. Tool and Cutter Sharpening (Workshop Practice), Harold Hall, Special Interest Model Books; UK ed. Edition, 2012
2. Kalpakjian, S. and Schmid R. (2014), Manufacturing Engineering and Technology, 7th Edition, Prentice Hall.
3. Mikell P. Groover, Fundamentals of Modern Manufacturing Materials, Processes, and Systems, 4th Edition, John Wiley & Sons, 2010.
4. Mikell P. Groover, Principles of Modern Manufacturing SI Version, 5th Edition, John Wiley & Sons, 2013.

BMMI 1063
SUSTAINABLE MACHINING /
KELESTARIAN PEMESINAN

LEARNING OUTCOMES

Upon completion of this course, students should be able to:

1. Recognize the concept of green manufacturing and sustainability in machining practices
2. Evaluate the principles and sustainability of using minimum resources for cost and energy saving
3. Relate the sustainable issues and acts in machining industry

SYNOPSIS

This course provides an overview on current sustainable machining. Its topics cover the concept in cutting tool management, lubrication strategy, optimization, economic, environmental dimensions. The course also covers design of experiment in machining trials.

REFERENCES

1. J. Paulo Davim, Sustainable Machining, 2017, Springer.
2. Peralta Álvarez M, Marcos Bárcena M, Aguayo González F. A Review of Sustainable Machining Engineering:
3. Optimization Process Through Triple Bottom Line. ASME. J. Manuf. Sci. Eng. 2016;138(10):100801-100801-16. doi:10.1115/1.4034277.

BMMI 1073
CONDITION MONITORING IN MACHINING /
PEMANTAUAN KEADAAN DALAM PEMESINAN

LEARNING OUTCOMES

Upon completion of this course, students should be able to:

1. Relate the application of design, maintenance, process and inspection in condition monitoring
2. Elaborate the potential of machining experts in condition monitoring
3. Develop on skills that required to be applied in condition monitoring

SYNOPSIS

This course exposes the student in performing condition monitoring is the process of determining the condition of machinery while in operation. It can be categorized into three aspects: Knowing what to listen for; How to interpret it ; When to put this knowledge to use. Understanding this couse enables to repair of problem components prior to failure. Condition monitoring not only helps plant personnel reduce the possibility of catastrophic failure, but also allows them to order parts in advance, schedule manpower, and plan other repairs during the downtime.

REFERENCES

1. BS ISO 13372: "Condition monitoring and diagnostics of machines. Vocabulary" (2012)
2. ISO (2011). ISO 17359:2011, Condition monitoring and diagnostics of machines - General guidelines. The International Organization for Standardization (ISO).
3. Simon R. W. Mills (2010). Vibration Monitoring and Analysis Handbook - (INST397). The British Institute of Non-Destructive Testing. ISBN 978-0-903132-39-8.

BMMI 1083
ASSESMENT OF MACHINABILITY /
PENILAIAN KEBOLEHMESINAN

LEARNING OUTCOMES

Upon completion of this course, students should be able to:

1. Define factors that is governed or influenced on the machinability
2. Measure the machinability of machining process
3. Organizing various methods of improvement for machinability

SYNOPSIS

This course provides students with the measurement of machining performances i.e. machinability. Machinability is an indicator of one engineering material on how easy or difficult to be machined to achieve acceptable performances. Engineers are often challenged to find ways to improve machinability without harming material performance, which are focused on the machining efficiency and productivity. However, unlike most material properties, machinability cannot be simplified into a unique work material property, but rather considering as a resultant property of the machining system which is mainly affected by work material's physical properties, heat treatment processes, and work-hardening behavior, as well as cutting tool materials, tool geometry, machining operation type, cutting conditions and cutting fluids. In addition, factors and method for improving machinability are also covered in this course.

REFERENCES

1. Erik Oberg, Franklin Jones, Holbrook Horton, Henry Ryffel, Christopher McCauley, (2016) 30th Edition, Machinery's Handbook, Industrial Press, 2014
2. Winston A. Knight, Geoffrey Boothroyd, (2005) 3rd Edition, Fundamentals of Metal Machining and Machine Tools, Taylor & Francis, 2012
3. J. Paulo Davim, (2014) 1st Edition, Machinability of Advanced Materials, Wiley
4. B Mills and A H Redford, (1983) 1st Edition, Machinability of Engineering Materials, Springer

BMMI 2094
PRECISION AND FINISING IN CNC TECHNOLOGIES /
KETEPATAN DAN KEMASAN DALAM TEKNOLOGI CNC

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Recognize the capabilities of 2, 3 axis CNC machining
2. Develop programs by using a coordinate system for milling and turning by using a ISO coding system
3. Manage production by using CNC machines to produce components

SYNOPSIS

This course provides students with concepts and practices in CNC machining that are computer programming of CNC milling and turning with specific processes such as drilling, tapping, boring, grooving, facing, pockecting, radius forming, angular cutting, and threading. Emphasis is on programming and production of parts including investigation in 2 and 3-axis programming techniques.

REFERENCES

1. J.L. Stauffer, (1993) Finishing Systems design & Implementation, Published by association of Finishing process of the Society of Manufacturing Engineers. (SME)
2. Practical CNC-Training for planning and shop-Hanser Publishers
3. Introduction to Computer Numerical Control-Barry Leathem-Jon

BMMI 2103
PRECISION AND FINISHING IN EDM AND GRINDING TECHNOLOGIES /
KETEPATAN DAN KEMASAN DALAM TEKNOLOGI EDM DAN PENGISARAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Recognize the capabilities of EDM and Grinding Proces
2. Develop programs by using a coordinate system for EDM and Grinding for machining solution
3. Manage production by using EDM and Grinding machines to produce components

SYNOPSIS

This subject introduces students to EDM and grinding technologies. It starts with introduction of EDM and grinding technologies. In addition, students will be exposed to knowledge about classification of EDM and grinding technologies for selected operation. This course also will introduce student to identify the principles and analysis of a tool design and tool manufactured in both machine applications. In this course, the tool drawing is important to students in order to operate and manage the machine in laboratory. The content in this lesson plan will guide the lecturer on the presentation.

REFERENCES

1. J.L. Stauffer, (1993) Finishing Systems design & Implementation, Published by association of Finishing process of the Society of Manufacturing Engineers. (SME)
2. Tool and Cutter Sharpening (Workshop Practice), Harold Hall, Special Interest Model Books; UK ed. Edition, 2012

BMMI 2114
PRISMATIC CADCAM PRODUCT /
PRODUK CADCAM PRISMATIK

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Design the product by using the CAD/CAM system
2. Apply the method of converting CADCAM design to the CNC programs
3. Manage the different procedures in NC programming

SYNOPSIS

This course covers complete integration of design and manufacturing simplifies the creation of manufacturing components and geometry. The topics involved feature-based and geometry-based programming, for easy adaptability to design changes. Student will practice predictable and reliable machining accelerates delivery of products to customers. Other skills that can be obtanied including capture and reuse your machining practices to streamline and standardize manufacturing methodologies. This course provides a complete solution, from design through NC code generation. NC program creation, process documentation, post-processing and toolpath verification and simulation.

REFERENCES

1. Fred Karam, Using CATIA V5, Tomson (Delma Learning), 2014
2. P N Rao, CAD/CAM Principles and Applications, 2nd Edition, McGraw Hill, 2004.
3. Chang T.C., Richard A. Wysk, Wang H.P., Computer-Aided Manufacturing, 2nd Edition, Prentice Hall, 2006.

BMTU 2124
TECHNOPRENEUR CAPSTONE 1: REVENUE GENERATION /
CAPSTONE TEKNOKEUSAHAWANAN 1 : PENJANAAN PENDAPATAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Apply various financial indicators & tools to prepare for financial information for a new business venture
2. Acquire skills to analyze financial statements
3. Present financial information for new busines
4. Display the art of negotiation with investors

SYNOPSIS

Entrepreneurs need money to start and to grow their business. It is important to understand how revenue is generated, how to source for funds, how to control cash flow, how to assess the succes of the company in monetary terms, and how to value a company for various purposes. The course exposes students to the various financial aspects relating to new ventures. These include approaches to secure start-up capital and venture financing. Students learn about the basic accounting, essential financial indicators, the types of funds available, the different categories of investors, the importance of intellectual property in securing finance, the financial details to be included in a business plan required for investment purpose, valuation of company and the art of negotiation with investors.

REFERENCES

1. NTU (2013). Entrepreneurship & Innovation Asia. Overview. Nanyang Technological University, Singapore: Nanyang Technopreneurship Center.
2. Cremades, A. (2016). The Art of Startup Fundraising. Pitching Investors, Negotiating the Deal, and Everything Else Entrepreneurs Need to Know. Hoboken, NJ: John Wiley & Sons.
3. McKinsey & Co., Koller, T., Goedhart, M. & Wessels, D. (2015). Valuation. Measuring and Managing the Value of Companies, 6th edn. Hoboken, NJ: John Wiley & Sons.

BMMI 2123
MULTI AXIS MACHINING /
PEMESINAN PELBAGAI PAKSI

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Create machining program for complex parts that require multi axis machiningApply the method of converting CADCAM design to the CNC programs
2. Differentiate different types of machine configuration and machine kinematics
3. Present sources and possibility of machine collision during machining

SYNOPSIS

This subject gives in depth knowledge to students regarding multi axis machining. As compared to basic CNC machining which comprises of 3 linear axes namely X, Y and Z axis, multi axis machining gives further capability to machine complex parts with the additional rotary axis A, B and C as well as mill-turn and turn-mill capability. Understanding machines configuration will be key to avoid collision during machining. Students will be introduced to different types of machine configuration and machine kinematics to have better understanding of machine tools in order to create effective and safe CNC machining programs.

REFERENCES

1. CNC Machining Handbook: Building, Programming, and Implementation by Alan Overby,
2. Publisher: McGraw-Hill Education TAB, Release Date: October 2010
3. Secrets of 5-axis Machining, Karlo Apro, Industrial Press, Inc New York, 2008

BMMI 2134
COMPLEX CADCAM PRODUCT /
PRODUK CADCAM KOMPLEKS

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Distinguish the different procedures in NC programming for complex product
2. Apply the method of converting to the CNC programs
3. Develop the geometric features and method to design complex CAD/CAM part

SYNOPSIS

This course is the continuity from the course of Prismatic CADCAM Product. Complex CADCAM product will be produced by using either 3, 5 or 9 axis CNC machines. The topics involed with construction views; cross section surface construction; trim plane surface; extruded surface; surface of revolution; drive curve surface construction; surface fillet construction; extending surface; composite surface construction.

REFERENCES

1. Fred Karam, Using CATIA V5, Tomson (Delma Learning), 2014
2. P N Rao, CAD/CAM Principles and Applications, 2nd Edition, McGraw Hill, 2004.
3. Chang T.C., Richard A. Wysk, Wang H.P., Computer-Aided Manufacturing, 2nd Edition, Prentice Hall, 2006.

BMMI 2143
HEAT TREATMENT OF THE MACHINED COMPONENTS/
RAWATAN HABA UNTUK KOMPONEN TERMESIN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Conduct heat treatment to alter the properties of selected steel
2. Differentiate the heat treatment application to change the properties of material
3. Present the capability heat treated steel to be apllied in other application

SYNOPSIS

This course will discuss the concept and application of heat treatment on various types of metal. The topics involved with the main alloying element that affected the hardenability of steel. The students will be exposed to the common heat treatment practice in industry. Student will also practice the quality control evaluation after heat treatment. Several advanced heat treatment process also will be discussed.

REFERENCES

1. Totten, G.E., 2010. Steel heat treatment: metallurgy and technologies. crc Press.
2. Sharma, R.C., 2008. Principles of heat treatment of steels. New Age International.

BMTU 3134
TECHNOPRENEUR CAPSTONE 2: MANAGING NEW & ONGOING VENTURES /
CAPSTONE TEKNOKEUSAHAWANAN 2: PENGURUSAN PERUSAHAAN BARU DAN BERTERUSAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Apply the business model canvas incorporating human and financial elements
2. Acquire skills to resolve organizational conflicts Present financial information for new busines
3. Write a convincing business plan
4. Evaluate vital organizational behaviours necessary to grow a new venture
5. Motivate all stakeholders and build a cohesive venture team

SYNOPSIS

The start-up and growth of an enterprise invariably involves both human and financial capital. To manage the increasing pool of human resources and to convince venture capitalists to invest become two main issues especially for growing venture. This course consists of two parts: in the first part, organization and human resource management are introduced; in the second part, the focus is on writing a convincing business plan to attract venture capital investment. When enterprise starts to take shape and grow, more people will be hired, proper organization, team building and human resource management will become important issues. In this course, students will be exposed to the various organizational aspects relevant to new ventures and established companies. These include the pros and cons of the different organization structures, conflicts that may arise among employees, and approaches to building strong teams. Human resourse management techniques will also be introduced and discussed. In the second part of the course, the business model canvas will be described listing the connections among the different components of a business. The value of a business plan and the techniques of writing a business plan will be introduced.

REFERENCES

1. NTU (2013). Entrepreneurship & Innovation Asia. Overview. Nanyang Technological University, Singapore: Nanyang Technopreneurship Center.
2. Cremades, A. (2016). The Art of Startup Fundraising. Pitching Investors, Negotiating the Deal, and Everything Else Entrepreneurs Need to Know. Hoboken, NJ: John Wiley & Sons.

BMMI 3154
ASSEMBLY METHOD /
KAEDAH PEMASANGAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Develop of product by assembly component manufacture various technique
2. Present the posibility to assemble components by using various techniques Implementing operational risk management (ORM)
3. Organize the components that can be assembled by design for manufacturing assembly (DMFA) approach

SYNOPSIS

This subject introduces students to assembly method. It starts with types and functions of joining techniques in metal and plastic part. In addition, students will be exposed to knowledge about process assembly for metal and plastic parts. This course also will introduce student to design for manufacturing and assembly application. In this course, the principle of assembly method is important to students in order to design effectively step by step of assembly.

REFERENCES

1. Geoffrey Boothroyd, Peter Dewhurst, Winston A. Knight. Product Design for Manufacture and Assembly (Manufacturing Engineering and Materials Processing) 3rd Edition, 2011. ISBN: 10.1420089277/ISBN:13.9781420089271.
2. Lanxess, A Design Guide, Joining Techniques in Engineering Plastics, Joining Techniques.2010.

BMMI 3214
REWORK AND REHABILITATION OF MACHINED COMPONENTS /
KERJA DAN PEMULIHAN KOMPONEN TERMESIN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Identify parts that can be reworked or rehabilitated
2. Propose the methods and procedures that can be utilized for rework and rehabilitation process
3. Verify whether reworked or rehabilitated parts are ready for use

SYNOPSIS

This subject gives an exposure on rework of machined part and rehabilitating machined components which are out of tolerance due to wear and tear. Rework are required when machined parts are under machined and still have unremoved materials due to tool wear during machining. Whereas rehabilitation of parts is required when a machined part is out of tolerance after servicing its purpose in the field. Students will gain understanding of rework and rehabilitation and be aware of its purposes in the field of manufacturing.

REFERENCES

1. Handbook of Mould, Tool and Die Repair Welding, 1st Edition, S Thompson, 2010

BMMI 3224
SURFACE AESTHETICS OF MACHINED COMPONENT / ESTETIKA PERMUKAAN UNTUK KOMPONEN TERMESIN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Propose the suitable surface treatment process for suitable application
2. Organize process to be applied to treat the surface from machining to coating process
3. Present the benefit of fine surface finish of machined component to reduce operational cost

SYNOPSIS

This course covers various types of coating method for performance and aesthetics purposes of machined component. It covers the fundamental of coating technologies, testing and procedures of each coating method.

REFERENCES

1. Tracton, A.A. ed., 2010. Coating Technology: Fundamentals, Testing, and Processing Techniques. CRC Press.
2. Kalpakjian, S., Vijai Sekar, K.S. and Schmid, S.R., 2014. Manufacturing engineering and technology. Pearson.

BMMU 3134
FINAL YEAR PROJECT 1 / PROJEK TAHUN AKHIR 1

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Explain the problem, objectives and scope of project associated to the industrial or community needs
2. Use relevant theory to produce solution.
3. Present the preliminary findings in the oral and written forms effectively

SYNOPSIS

The student needs to plan and implement the project individually that related to the respective engineering technology field. The student should implement a project, do the analysis and apply the theory to solve the problems related to topic. At the end, the student should write a problem based learning report that covers problem statement, literature review, methodology to overcome the problem. The student needs to achieve the objective of the project and presented it in the report.

REFERENCES

1. Manual Projek Sarjana Muda (PSM).

BMMI 3234
MACHINE MAINTENANCE /
PENYELENGGARAAAN MESIN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Present the different techniques in machine maintenance
2. Propose preventive maintenance program with consideration of cost, manpower and time
3. Demonstrate problem solving of real life condition regards to machine maintenance issues

SYNOPSIS

The student will be exposed to the maintenance technique, trouble-shooting and fault diagnosis for mechanical equipment. Among the basic maintenance methods are: condition based monitoring, vibration analysis, alignment dynamic balancing and mechanical seals. Students also will also learn about trouble-shooting and maintenance of various machines and components such as valve, pump, compressor, gear etc. The essential steps of disassemble, check, trouble-shoot, repair and reassemble of mechanical components will be stressed in this course.

REFERENCES

1. Daniel E., Whitney, 2012, Mechanical Assemblies: Their Design, Manufacture and Role In Product Development, Oxford University Press
2. Joel Levitt, 2010, Tpm Reloaded: Total Productive Maintenance, 1st Edition, Industrial Press
3. Smith, Ricky, And Bruce Hawkins. Lean Maintenance: Reduce Costs, Improve Quality, And Increase Market Share. Amsterdam: Elsevier Butterworth Heinemann, 2004

BMMI 3244
PROJECT MANAGEMENT AND SUPERVISION /
PENGURUSAN PROJEK DAN PENYELIAAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Present the case study that exhibit excellent project manager
2. Analyzing the main factors influencing project management outcome with consideration of profesionalism and ethics
3. Develop project management skills through theoretical understanding and practical application of the project management principles

SYNOPSIS

This course provides a systematic and thorough introduction to all aspects of project management and supervision. Projects are an increasingly important aspect of modern business, so we begin with the relation between projects and the strategic goals of the organization. This course covers the technical, cultural, and interpersonal skills necessary to successfully manage projects from start to finish. The course emphasizes that manufacturing project management with its own tools, body of knowledge, and skills.

REFERENCES

1. Project Management Institute, A Guide to the Project Management Body of Knowledge: (PMBOK® Guide) Sixth edition, PMI, 2018, ISBN 9781628253825
2. Frame, J. Davidson, Managing Projects in Organizations: How to Make the Best Use of Time, Techniques, and People, 3rd edition, Jossey-Bass, 2003, ISBN 0-787-96831-5
3. Project Management Institute, The Standard for Program Management, Third Edition, Project Management Institute, 2013, ISBN 978-1935589686
4. Stackpole, Cynthia Snyder, A Project Manager's Book of Forms: A Companion to the PMBOK® Guide, Wiley, 2009, ISBN 978-0470389843
5. Weiss, Joseph and Wysocki, Robert, Five-phase Project Management: A Practical Planning and Implementation Guide, Basic Books, 1992, ISBN 0-201-56316-9

BMMI 3254
ACTS AND RISKS ASSESMENT IN MACHINING PRODUCTION/
AKTA DAN PENILAIAN RISIKO DALAM PENGELUARAN PEMESINAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Be able to assess, analyse and interpret risks to the health and safety
2. Able to plan, organise, control, monitor and review the preventive and protective measures
3. Implementing operational risk management (ORM)

SYNOPSIS

This subject teaches students the about health and safety and work in safer and healthier ways. student will be exposed with the related act. Apart from that, the regulations set by the department of environment (DOE) and department of occupational safety & health (DOSH) are also being exposed to students.

REFERENCES

1. FAA System Safety Handbook, Health and safety in engineering workshops, 2010.
2. Serope Kalpakjian and Steven R Schmid, K. Manufacturing Engineering and Technology 7th Edition. Pearson Education, 2016. ISBN-13: 978-0133128741/ISBN-10: 0133128741.

BMMU 3186
FINAL YEAR PROJECT 2 /
PROJEK TAHUN AKHIR 2

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Analyze data in a meaningful form using relevant tools.
2. Perform project implementation systematically
3. Present the results in the oral and written forms effectively

SYNOPSIS

This is the second part of the Bachelor Degree Project. Students are expected to continue the project performed in Bachelor Degree Project until completion. At the end of the semester, students are required to submit the Bachelor Degree Project report and present their projects for assessment.

REFERENCES

1. Manual Projek Sarjana Muda (PSM).
2. Faculty Student 's Log Book
3. Faculty Final Year Project Guide Book

BMMU 3186
INDUSTRIAL TRAINING /
LATIHAN INDUSTRI

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Solve technology related problems using methods, tools and techniques learnt throughout the training
2. Explain effectively with the technical community and produce technical reports and presentations.
3. Demonstrate social ethique and professionalism in technology practice.

SYNOPSIS

Industrial training is a compulsory component for degree program students at Universiti Teknikal Malaysia Melaka (UTeM). The experience and skills acquired from a period of placement can be invaluable and provide the advantage to the students when applying for employment after graduation. During the training period with the relevant industry, students are expected to involve in the following areas of training in order to achieve the underlying objectives: Manufacturing, production process and / or its optimization process, mechanical design and product, maintenance and repair of equipments, poduct testing and quality control.

REFERENCES

1. Faculty Student 's Log Book
2. Faculty Final Year Project Guide Book

ELECTIVE

BMMI 3184
AEROSPACE MACHINING / PEMESINAN AEROANGKASA

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Relate the profesion of design, maintenance, process and inspection in the aerospcae industry
2. Elaborate the potential of machining experts in the aerospace industry
3. Develop on characteristics that can be adapted in the aerospace industry

SYNOPSIS

This course provides students with advanced concepts and practices in CNC machining that are advanced computer programming of CNC milling and turning specific for aerospace machining processes such as profiling, drilling, boring, grooving, facing and threading. Emphasis is on programming and production of complex aerospace parts including investigation in 3, 4 and 5-axis programming techniques, utilizing canned cycles, macros (subroutines), looping and parametric programming. The uses of CAM in producing complex and efficient programming techniques are also covered.

REFERENCES

1. Erik Oberg, Franklin Jones, Holbrook Horton, Henry Ryffel, Christopher McCauley, (2016) 30th Edition, Machinery's Handbook, Industrial Press
2. Winston A. Knight, Geoffrey Boothroyd, (2005) 3rd Edition, Fundamentals of Metal Machining and Machine Tools, Taylor & Francis J. Paulo Davim, (2014) 1st Edition, Machinability of Advanced Materials, Wiley
3. J. Paulo Davim, (2011) 1st Edition, Machining of Hard Materials, Springer
4. A Mouritz, (2012) 1st Edition, Introduction to Aerospace Materials, Woodhead Publishing.

BMMI 3194
HUMAN FACTOR TECHNOLOGY / TEKNOLOGI FAKTOR KEMANUSIAAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Relate the profesion of design, maintenance, process and inspection in the human factor technology
2. Elaborate the potential of machining experts in the human factor technology
3. Develop on characteristics that can be adapted in the human factor technology

SYNOPSIS

This course provides human factor technologies pertinent to machine building particularly on ergonomic issues. Ergonomics (or human factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance. Ergonomists in machining contribute to the design and evaluation of tasks, jobs, products, environments and systems in order to make them compatible with the needs, abilities and limitations of a machinist.

REFERENCES

1. Tewari, P. C. (2017). Work study and ergonomics. Boca Raton: CRC Press.
2. Shorrock, S. T., & Williams, C. (2017). Human factors and ergonomics in practice: Improving system performance and human well-being in the real world. Boca Raton: CRC Press Taylor & Francis Group.
3. Bridger, R. S. (2018). Introduction to human factors and ergonomics. Boca Raton, FL: CRC Press, Taylor & Francis Group.

BMMI 3204
PRODUCTION PLANNING IN MACHINING /
PERANCANGAN PENGELUARAN DALAM PEMESINAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Relate the profesion of design, maintenance, process and inspection in the production planning
2. Elaborate the potential of machining experts in the production planning
3. Develop on characteristics that can be adapted in the production planning

SYNOPSIS

The process planning in machining is basically a plan of how the designed parts will be fabricated, machine and equipment selection, to achieve required specification. It involves proper and strategic decisions along with analysis in order to plan and adapt the production of every single component that will be built. This course intent to provide substantial knowledge on production planning in machining. The course covers from the philosophy of process and machining engineering, methods of production planning, and up until production planning practices.

REFERENCES

1. Manjuri Hazarika, Uday Shanker Dixit. (2014). Setup Planning for Machining: Springer
2. LaRoux K. Gillespie. (2017). Design for Advanced Manufacturing: Technologies and Processes: McGraw Hill Professional.
3. Yousef Haik, Sangarappillai Sivaloganathan, Tamer M. Shahin. (2015). Engineering Design Process. Cengage Learning.

BMMI 3174
RAPID MACHINING /
PEMESINAN PANTAS

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Relate the profesion of design, maintenance, process and inspection in the rapid machining
2. Elaborate the potential of machining experts in the rapid machining
3. Develop on characteristics that can be adapted in the rapid machining

SYNOPSIS

The course will introduce the concepts of Rapid Machining (RM). It covers the knowledge on materials as workpiece, cutting tools, cutting conditions and machines used in the RM. Instead of that, students will learn to develop CNC programming for RM and also analyse the cutting performance of RM.

REFERENCES

1. King, R., 2013. Handbook of high-speed machining technology. Springer Science & Business Media.
2. El-Hofy, H.A.G., 2013. Fundamentals of machining processes: conventional and nonconventional processes. CRC press.

BMMI 3164
TOOL AND DIE MAKING /
PEMBUATAN PERKAKAS DAN DAI

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Relate the profesion of design, maintenance, process and inspection in the tool and die making
2. Elaborate the potential of machining experts in the tool and dia making
3. Develop on characteristics that can be adapted in the tool and die making

SYNOPSIS

This subject introduces students to tool and die making. It starts with introduction about press machine. Further, students will be exposed to the knowledge about elements of progressive combination and compound dies. This course also introduces to student how to identify the principles and analysis of a mould. Finally, student will be explained the design considerations in design tool, mould and die.

REFERENCES

1. Injection Moulding Machine-Parameters and Product Improvement Guideline, Abd. Kahar Nordin, Norfauzi Tamin, Mohd Hadzley Abu Bakar, Penerbit UTeM2019, ISBN: 978-967-2145-42-4.
2. Tool and Cutter Sharpening (Workshop Practice), Harold Hall, Special Interest Model Books; UK ed. Edition, 2006

BMMK Technology Courses

BMMK 1014
SAFETY IN WELDING/ KESELAMATAN DALAM KIMPALAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Apply the welding risk control based on procedures in the working environment
2. Create control method to minimize the impact of possible hazard in the working environment
3. Evaluate welding hazards that impact the safety, health, and environment at working area

SYNOPSIS

The aim of this course is to expose students on safety practices and procedures. The students are required to identify types of hazards that may incur in industries especially related to welding processes. The students are required to understand equipment,

REFERENCES

1. Phil Hughes, Ed Ferrett, Introduction to International Health and Safety at Work, Elsevier, 2013
2. Goetsch, D. L. Occupational Safety and Health for Technologists, Engineers, and Managers, 9th Edition, Upper Saddle River, NJ: Prentice Hall, 2019
3. John Cadick et.all. Electrical safety handbook, 2012

BMMK 1024
CAD AND WELDING GRAPHICS/ CAD DAN GRAFIK KIMPALAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Explain the engineering drawings include welding symbol and standard codes
2. Construct technical drawing using manual sketching and computer aided design
3. Communicate by using engineering drawings for welding application

SYNOPSIS

The course will provide students with an understanding of the importance of engineering graphics as a communication tool specially for welding application. Student will be exposed to geometry drawing, orthographic drawing, section view, isometric drawing, assembly drawing, dimension, tolerance, welding symbol and standard codes using manual sketches and computer aided design (CAD) software.

REFERENCES

1. Dix, M. & Riley, P., 2014, Discovering AutoCAD 2017 Prentice Hall, New York.
2. Giesecke, F. E., Mitchell, A., Spencer, H. C., Hill, I. L., Dygdon, J. T. and Novak, J. E., 2016, Technical Drawing, 15th Ed., Prentice Hall, New York.
3. Jensen, C., & Jay D. H., 2007, Engineering Drawing and Design, 7th Ed., Glencoe and McGraw Hill, New York.
4. James D. Bethune, 2018, Engineering Graphics with AutoCAD 2017, Prentice Hall.
5. Welding symbol and standard code note

BMMK 1034
METAL FABRICATIONS TECHNOLOGY/ TEKNOLOGI FABRIKASI LOGAM

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Manipulating the basic principles and scientific processes and materials to produce products with reasonable judgment.
2. Demonstrate understanding of the concept and use of the terms contained in metal fabrication and welding technology.
3. Organizing themselves either its individuals or in groups during project generating process.

SYNOPSIS

This course is to equip students with the knowledge of metal fabrication and welding technology to improve manufacturing expertise in providing human capital development at par with global technological developments.

REFERENCES

1. Kalpakjian, Schmid, Steven R. (2018). Manufacturing Engineering and Technology - 7th ed. Pearson India.
2. Yogesh Jaluria (2018). Advanced Materials Processing and Manufacturing (Engineering Series) - 1st ed. Springer.
3. Larry Jeffus (2018) Welding: Principles and Applications - 8th ed. Cengage Learning.
4. T.S. Srivatsan, T.S. Sudarshan, K. Manigandan (2018) - Manufacturing Techniques for Materials: Engineering and Engineered- 1st ed. CRC Press.
5. Myer Kutz (2015). Mechanical Engineers' Handbook: Materials and Engineering Mechanics- 4th ed. Wiley.
6. Jerry P. Byers (2017). Metalworking Fluids (Manufacturing Engineering and Materials Processsing) - 3rd ed. CRC Press.
7. Josef Dillinger & Falko Wieneke (2016). Metal Engineering Textbook. Europa Lehrmittel Verlag.

BMMK 1043
PRODUCT DESIGN IN WELDING/ REKABENTUK PRODUK DALAM KIMPALAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Apply an appropriate design method of developing a practical solution of product design problem
2. Develop a practical design solution through a systematic investigation of the product design problem exspecially welding product application
3. Communicate effectively in written, oral and visual including teamwork.

SYNOPSIS

This subject covers product design problems, formulating design problems, concept design, configuration design, parametric design, product costing, project and teamwork exspecially for welding product application

REFERENCES

1. Dieter, G. E., Schmidt, L. C, 2012. Engineering Design. 5th Edition McGraw-Hill/Higher Education, Singapore.
2. Ulrich, K. T. and Eppinger, S. D. 2016. Product Design and Development. McGraw-Hill
3. Haik, Y and Shahin, T., 2018. Engineering Design Process. 2nd CENGAGE Learning, Stamford, USA.
4. Rudolph J Eggert, 2010. Engineering Design. Pearson Prentice Hall.
5. Ullman, D.G. 2010. The Mechanical Design Process. McGraw-Hill Education (Asia), Singapore.

BMMK 1054
WELDING DOCUMENTATION/ DOKUMENTASI KIMPALAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Apply welding procedure qualification and welder qualification.
2. Construct various type of drawing design and symbol in welding according to related standard.
3. Demonstrate type of drawing design and symbol in welding as required according to related standard.

SYNOPSIS

The job of welding inspection requires that the inspector possess or have access to agreat deal of information and guidance. Welding inspectors cannot evaluate a welded structure without information from the designer or the welding engineer regarding weld quality. The inspector also needs to know when and how to evaluate the welding. To satisfy this need, there are documents available to be performed. Many of these documents also include acceptance criteria with codes and standards. The course identifies the competence required in welding design, welding joint detail and welding symbol according to AWS/BS/ISO standard

REFERENCES

1. Blueprint Reading for Welders (2015), A.E. Bennet, Cengage ISBN978-1133605782.
2. Standards: American Welding Society (AWS), D1.1 (2015)
3. David J Hoffman, Kevin R Dahle, David J Fisher (2016). Welding. New Jersey: Pearson Education David J Hoffman.

BMMK 1064
NON-CONVENTIONAL WELDING PROCESS/ PROSES KIMPALAN BUKAN KONVENSIONAL

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Identify types of joining processes applied in manufacturing sector.
2. Practice the joining processes using certain equipment to make variety of joints.
3. Explain the characteristics of joining in terms of process, equipment and setup.

SYNOPSIS

This subject is to provide student with welding processes that are not commonly used in the current industries that can be categories as new or advanced welding technology. Students will be exposed all welding processes and required should be able to perform process selection when deal with the special and complex demand of welding work.

REFERENCES

1. Kapil Gutha (2017). Advanced Manufacturing Technologies: Modern Machining, Advanced Joining, Sustainable Manufacturing (Materials Forming, Machining and Tribology)- 1st ed. Springer.
2. Edward R.Bohnart (2017). Welding Principles and Practices - 1st ed. Ma-Graw-Hill Education.
3. David J. Hoffman, Kevin R.Dahle, David J.Fisher (2016). Welding - 2nd ed. Pearson.
4. Andrew D. Althouse (2018). Modern Welding - 12th ed. Goodheart-Willcox.

BMMK 2074
IMPERFECTION IN WELDING AND TESTING/
PENGUJIAN DAN KETIDAKSEMPURNAAN DALAM KIMPALAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Apply welding inspection method.
2. Implement the characteristics of metal properties and destructive testing.
3. Analyse the inspection and other NDE methods.

SYNOPSIS

The course will provide students with knowledge of identifying types of defects and the strategy of controlling the imperfection. The students will also require to perform mechanical destructive test that is tensile, bending, copy and hardness test. The competence required for checking fabrication materials, structural alignment & dimensions, checking welding quality (welding defect/distortion and weld repair).

REFERENCES

1. Amitava Mitra (2016). Fundamentals of Quality Control and Improvement. J. Paul Guyer (2017). An Introduction to Welding Inspection 2. John C. Uppold (2015). Welding Metallurgy and Weldability
2. Ram Babu Sao (2016). Perfect: Quality Assurance & Quality Control. New York: CreateSpace Independent Publishing Platform.
3. David J Hoffman, Kevin R Dahle, David J Fisher (2016). Welding. New Jersey: Pearson Education

BMMK 2084
MATERIALS BEHAVIOUR IN WELDING/ TINGKAHLAKU BAHAN DALAM KIMPALAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Classify metals based on generic properties, structural relationships with properties, especially the emergence of microstructures by heat treatment methods for the metal class.
2. Explain the behaviour of structural in fusion welding and testing of materials welded joints.
3. Discuss the classification of composite and ceramic based on the testing and the microstructure.

SYNOPSIS

This course describes the materials used in engineering. Scope covers Materials introduction; latest developments in materials, introduction to metal, metal forging. Metal structure; scale relationship with nature, and phase diagram. This course also will provide the students with understanding of the Microstructure development with heat treatment and mechanical properties. The students will be exposed to light alloy processing and diffusion process with microstructural appearance on thermal and mechanical properties. This course also covers the knowledge of the ceramic classification, polymer classification and composite on microstructure relationship and mechanical properties.

REFERENCES

1. Neville, A. M. (2015). Concrete technology. Harlow, England ; New York :Prentice Hall. LC Call Number: TA439.N462.
2. Askeland, Donald R.; Pradeep P. Phulé (2016). The Science & Engineering of Materials.Thomson-Engineering. LC Call Number: TA403.D87 2010
3. Callister, Jr., William D. (2014). Materials Science and Engineering – An Introduction. John Wiley and Sons. LC Call number: TA403 .C33 2011
4. Lewis, P.R., Reynolds, K. & Gagg, C. (2003). Forensic Materials Engineering: Case Studies. Boca Raton: CRC Press. LC Call number: TA219 .L48 2004
5. Mathews, F.L. & Rawlings, R.D. (1999). Composite Materials: Engineering and Science. Boca Raton: CRC Press. LC Call number: TA418.9.C6 .M37 1999

BMMK 2194
SAFETY MANAGEMENT/ PENGURUSAN KESELAMATAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Explain the different requirements and regulations of Factory and Machinery Act, Occupational Safety and Health Act.
2. Conduct hazard identification and risk assessment in workplace.
3. Construct preventive and control technique according to the acts pertinent to the Occupational Safety and Health.

SYNOPSIS

Safety management is a course that design to provide knowledge for managing activities in the business workplace that apply comprehensive management system designed to manage safety elements in the workplace. It includes acts, policy, objectives, plans, risk assessement, procedures, organisation, responsibilities and other measures. This is important to prevent accidents, injuries and other impact to the organisation that shows the role of management that focus to deter such catastrophic.

REFERENCES

1. Taylor, J. B. (2012). Safety culture: assessing and changing the behaviour of organisations. Gower Publishing, Ltd..
2. Geller, E. S. (2017). Working safe: How to help people actively care for health and safety. CRC Press.
3. Bahari, I. (2002). Pengaturan sendiri di dalam pengurusan keselamatan dan kesihatan pekerjaan. Mc Graw Hill.
4. Griffith, A., & Howarth, T. (2014). Construction health and safety management. Routledge.

BMMK 2114
WELDING DESIGN ANALYSIS/ ANALISIS REKABENTUK KIMPALAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Describe basic concepts and fundamental principles of mechanical applications.
2. Apply basic concepts and fundamental principles to solve design for welding application.
3. Analyze basic problems in design considerations for welding.

SYNOPSIS

The subject covers: Static: General principle, Force vector and Equilibrium of Particle; Mechanics: Principle of Stress & Strain, Torsion; Mechanics: Pure Bending and analysis and design of beams for bending; Welded design Program; Design Equations; Welded design Considerations; Design for welded join; Weld join design

REFERENCES

1. Hibbeler, R.C., 2016, Engineering Mechanics-Statics, 14thEditions, Pearson.
2. Beer, F.P., Johnston E.R, DeWolf J.T and Mazurek D.F, 2015, Mechanics of Materials 7th Editions in SI Units,McGraw-Hill.
3. Design for welding, Welding Handbook Chapter Committee on Design for Welding, 2003, American Welding society
4. V.M. Radhakrishnan 2005, Welding Technology and Design

BMMK 2124
ELECTRICAL WELDING EQUIPMENT/
PERALATAN KIMPALAN ELEKTRIK

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Examine the physical phenomenon occurring in the arc and the types of forces and metal transfer in the arc based on measurements of power source characteristics.
2. Demonstrate the right choice of diode material, thyristors and inverters based on the understanding of the basic principles and methods for controlling the volt-ampere characteristics of the electric welding machines.
3. Integrate the welding current, voltage, temperature, load and displacement using equipment's such as clamp meter, LVDT, arc welding analyzer and resistance for welding quality monitoring.

SYNOPSIS

This subject is aimed to provide the students with the understanding of static and dynamic characteristics of the electric arc and its associated power characteristics. Students will learn the basic principles, methods and circuit components that control operating power and the volt-ampere characteristics in electrical resistance and arc welding. Through that students will gain knowledge of the operating principles of Alternators, D.C. generators and motors used for welding.

REFERENCES

1. WATERS, T. F. (2017). Fundamentals of manufacturing for engineers. Place of publication not identified: CRC Press.
2. Abu Hassan Ismail. (1993). Kimpalan dan Potongan Gas : Manual Bengkel. IBS Buku. LC Call Number: TS227 .A38 1993
3. Groover, M. P. (2015). Fundamentals of Modern Manufacturing. Wiley.
4. Kalpakjian, S., Schmid, S. R., & Sekar, K. S. (2016). Manufacturing: Engineering and technology. Melbourne, Victoria, Australia: Pearson Australia.
5. Crowson, Richard. (2006), The Handbook of Manufacturing Engineering. Taylor and Francis. LC Call Number: TS183 .H36 2006 v.1

BMMK 2134
NON DESTRUCTIVE TESTING/
UJIAN TANPA MUSNAH

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Explain the current basic and some advanced principles of Non-Destructive Testing (NDT) techniques to satisfy complex engineering problems.
2. Select and propose suitable NDT techniques based on their analysis on engineering problems that fulfill the standard practice
3. Develop the ability to communicate effectively using available resources to disseminate knowledge of NDT techniques in relation with industrial problem.

SYNOPSIS

This course introduces the basic principles of non-destructive testing and the methods of non-destructive testing that are widely use in the industry, which are Visual Inspection, Penetrant Test, Magnetic Particle Testing, Eddy Current Testing, Ultrasonic Testing and Radiographic Testing. This course also covers the execution, evaluation and interpretation of each NDT techniques. The advantages, limitations and main application of each NDT techniques are also provided.

REFERENCES

1. Nathan Ida, Norbert Meyendorf (2019). Handbook of Advanced Non-Destructive Evaluation - 1st ed. Springer.
2. Gerardus Blokdyk (2018). Nondestructive Testing - 3rd ed. 5STARCooks.
3. R.S. Sharpe, J.West and D.S Dean (2017). Quality Tehcnology Handbook - 4th ed. Butterworth-Heinemann.
4. F.P.G. Marquez, M. Papaelias, Noor Zaman (2016). Non-Destructive Testing. InTech Open.
5. Wesley Davis (2015). Procedures and Applications of Nondestructive Testing. NY RESEARCH PRESS.

BMMK 2224
COMPUTER AIDED ANALYSIS/
ANALISIS BERBANTU KOMPUTER

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Analyse basic stress analysis for welding connection.
2. Apply fundamental sketching and feature modeling, build feature based models of parts and assemblies for easy editing.
3. Produce document design intent of parts and assemblies (include weld design) in manufacturing drawings.

SYNOPSIS

This course will empower the students with fundamental knowledge and technical skills of 3D solid modeling skills using industry-proven 3D mechanical CAD software. The students will learn about the different techniques for creating solid models and surface with emphasis on design intent. The students also will expose to the introduction to FEA structure/stress analysis, FEA application for weld product (welding connection analysis). The course includes hands-on exercises and best practice methods for students during drafting stage, part, assembly (weld product) and Finite Element Analysis (weld product)

REFERENCES

1. Tickoo, P. , 2016, Catia V5-6R2015 For Designers, 13th Ed., CADCIM Technologies, USA.
2. Dassault Systeme, 2008, CATIA: Part Design Fundamental, Generative structure analysis, generative assembly structure analysis, France.
3. Giesecke, F. E., Mitchell, A., Spencer, H. C., Hill, I. L., Dygdon, J. T. and Novak, J. E., 2016, Technical Drawing, 15th Ed., Prentice Hall, New York.
4. Jensen, C., and Helsel, J. D., Short, D.R., 2017, Engineering Drawing And Design, 7th Edition, Glencoe and McGraw Hill, India.

BMMK 3144
ECONOMIC OF WELDING AND PROCUMENT/
EKONOMI KIMPALAN DAN PEROLEHAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Calculate welding costs that iclude machine, material and labour.
2. Suggest the effective costing and the factors influencing welding costs.
3. Record of transactions in jurnal and ledgers, trial-balance and preparation of final account.

SYNOPSIS

The aim of this course is to provide participants with a clear understanding of the principles of effective procurement by utilising the capabilities to plan, implement, and evaluate a sourcing process appropriate to the value/ risk of the joining technology, materials/ part/ equipment being procured, communication and negotiation skills, and capacity to to manage strategic supply, services and consultancy contracts. Besides to acquire knowledge in welding economics in the selection of process, consumables and workpiece materials.

REFERENCES

1. L. P. Connor, (2016) Economics In Welding And Cutting, American Welding Society.
2. Peter Baily, David Farmer, varry Crocker, David Jessop, David Jones, (2015) Procurement Principles and management, Pearson
3. R. panneerselvam, (2008), Engineering Economics, Eastern Economy Edition

BMMK 3184
WELDING QUALITY ASSURANCE/
JAMINAN KUALITI KIMPALAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Design a plan for quality assurance and control in welding manufaturing process according specifications and standards
2. Demonstrate the procedure and inspection techniques related to welding assurance and control.
3. Apply creative thinking in problem solving to solve the problems associated with welding assurance and control.

SYNOPSIS

This subject provides students with knowledge related with welding quality assurance. They will be taught with various topics covering Introduction to Welding Quality Assurance, Quality System Management and Responsibilities, Quality Assurance Planning, Welding Quality Standards, Inspections and Tests, Statistical Process Control, Nonconformances and Corrective Actions, Preventive Actions, Quality Audits, Records and Documents Control.

REFERENCES

1. Jay Heizer, Bery Render, Chuck Munson (2016). Operations Management: Sustainability and Supply Chain Management -12th Edition. Pearson
2. R.S. Sharpe, J.West and D.S Dean (2017). Quality Tehcnology Handbook - 4th ed. Butterworth-Heinemann.
3. Kalpakjian, Schmid, Steven R. (2018). Manufacturing Engineering and Technology - 7th ed. Pearson India.
4. William J Stevenson (2017). Operation Management - 13th ed. McGraw-Hill Education.

BMMK 3193
CYBER PHYSICAL SYSTEMS IN WELDING/
SISTEM FIZIKAL SIBER DALAM KIMPALAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Justify the added value that can be achieved through application of CPS in welding process.
2. Demonstrate effectively the appropriate CPS tools in acquiring process variables in real time.
3. Criticise the logged data acquired from conventional and non conventional welding techniques.

SYNOPSIS

The aim of this course is to provide participants with a clear understanding of the potential application of cyber-physical systems (CPS) in welding industry. Competency in applying CPS technology, both with standalone and built-in CPS in analysis of welding parameters (e.g. current, temperature) and welding outputs (e.g. fume composition, welding bead) is thought for improving the marketability of the graduates in the era industrial revolution 4.0

REFERENCES

1. Alur, R. (2015). Principles of cyber-physical systems. MIT Press.
2. Jeschke, S., Brecher, C., Meisen, T., Özdemir, D., & Eschert, T. (2017). Industrial internet of things and cyber manufacturing systems. In Industrial Internet of Things (pp. 3-19). Springer, Cham.
3. Pires, J. N., Loureiro, A., & Bölmsjo, G. (2006). Welding robots: technology, system issues and application. Springer Science & Business Media."

BMMK 3214
MANAGING PRODUCTION AND SUPERVISION/
PENGURUSAN PENGELUARAN DAN PENGAWASAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Evaluate total welding process performace based on quality management system.
2. Perform planning, schedulling and control.
3. Propose solution for solving related supervision problem.

SYNOPSIS

Welding production planning is another very important element in manager's responsibility to allocate the resources required to achieve cost-effectiveness in welding processes. Furtheremore, this subjet shall cover manager's responsibility to maintain equipment and consistently meet throughput requirements with a level of quality that conforms to the required standards.

REFERENCES

1. J.R. Barckhoff (2005), Total Welding Management, American Welding Society.
2. Kerzner, H.R., (2017), Project Management : A Systems Approach to Planning, Scheduling, and Controlling, 12th Ed. John Wiley & Sons Inc, USA.
3. Cartlidge, D., (2015), Construction Project Manager's Pocket Book, 1st Ed. Routledge, USA.
4. Fredrike Bannik, (2014), Handbook of Positive Supervision, Hogrefe Publishing

BMMK 3204
RECLAIMINATION IN WELDING/
PEMULIHAN DALAM KIMPALAN

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Extrapolate the repair welding skill and apply techno-economics for practical problems.
2. Demonstrate high quality of repair welding which will benefit the industry in term of productivity and savings.
3. Acquire the skills to carry out practical feasible repair techniques maintaining low cost.

SYNOPSIS

The aim of this subject is to to acquire knowledge and to solve problems associated with failure and to update personal on the latest technology to ensure welded subject would be maintained in good operating condition and at low maintenance cost.

REFERENCES

1. Dobly R.E., Kent K.S., (1986) Repair and Reclamation", The Welding Institute.
2. Jeffus, L. F. (2017). Welding: Principles and applications. Australia: Cengage Learning.
3. Bowditch, W. A. (2018). Modern Welding. S.L.: Goodheart-Willcox.
4. Lippold, J. C. (2015). Welding metallurgy and weldability. Hoboken, NJ: John Wiley & Sons.
5. Welding inspection technology: Workbook. (2008). Miami, FL: American Welding Society, Education Services.

ELECTIVE

BMMK 3154
NON DESTRUCTIVE TEST FOR PROFESSIONAL
UJIAN TANPA MUSNAH UNTUK PROFESIONAL

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Construct testing instruction and work planning.
2. Suggest the condition of welding based based on the NDT signal.
3. Recommend the maintenance and calibration of the NDT equipment.

SYNOPSIS

This subject covers the preparation for the certification in the selected NDT technology. Certification is important because NDT personnel need to make critical judgments that can have safety and/or significant financial consequences. Therefore, in this subject elements of technology preparation, operation, planning, data collection and interpretation, and maintenance are being provided.

REFERENCES

1. International Standard ISO 9712
2. New Technologies in Electromagnetic Non-destructive Testing, (2016), Songling Huang and Shen wang
3. National Occupational Skill Standard, Department of skills Development
4. Non Destructive test, (2016), Fausto Pedro García Márquez, Mayorkinos Papaelias, Noor Zaman
5. Ultrasonic Methods of Non-destructive Testing, (1996), Jack Blitz and Geoff Simpson.
6. Non-destructive Testing Techniques, (2009) Ravi Prakash

BMMK 3164
WELDING TECHNOLOGY FOR PROFESSIONAL/
TEKNOLOGI KIMPALAN UNTUK PROFESIONAL

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Design a WPS and WPQTusing according specifications and standards.
2. Develop the welding procedure based on knowledge related to weld techniques and position.
3. Suggest solution to the problems associated with welding qualification

SYNOPSIS

This subject provides students with knowledges and skills related with welding technology. They will be taught with various topics covering Introduction to Welder Certification Scheme, Welding Processes and Procedures, Welding Codes and Standards, Welding Procedure specification (WPS), Welding Procedure Qualification Test (WPQT), Pre and Post-Weld Inspection, Reports and Documentations and Welder Qualification Training and Testing (WQT).

REFERENCES

1. Gower A. Kennedy, 2012, Welding Technology, 5th Ed. Howard W. Sams., Prentice Hall.
2. O.P. Khanna, 2015 A text Book of Welding Technology, 1st edition, Dhanpat Rai Publication.
3. Larry Jeffus, 2017, Welding Principles and Application, 8th edition, sense publication.

BMMK 3174
WELDING INSPECTION FOR PROFESSIONAL/
PEMERIKSAAN KIMPALAN UNTUK PROFESIONAL

LEARNING OUTCOMES

Upon completion of this course, student should be able to:

1. Explain the duties and responsibilities of a welding inspector including fusion welding processes, typical weld defects, types of steel (including carbon-manganese, low alloy and stainless steels), the hardening of steels, weldability, heat treatment, and parent metal defects.
2. Develop procedure for approval based on codes and standards, and an outline of safe working practices
3. Justify the test requirement of visual inspection, the testing of parent metals and welds, and destructive and non-destructive test techniques.

SYNOPSIS

This course will teach the duties and responsibilities of a welding inspector including fusion welding processes, typical weld defects, types of steel (including carbon-manganese, low alloy and stainless steels), the hardening of steels, weldability, heat treatment, and parent metal defects. The course also includes visual inspection, the testing of parent metals and welds, and destructive and non-destructive test techniques. It is also learnt in the course about welder and procedure approval, codes and standards, and an outline of safe working practices.

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1. Hughes, S. E. (2009). A Quick Guide to Welding and Weld Inspection. Amer Society of Mechanical.
1. 2.Welding inspection technology. (2008). Miami, FL: American Welding Society, Education Dept.
2. Gower A. Kennedy, 2012, Welding Technology, 5th Ed. Howard W. Sams., Prentice Hall.
3. O.P. Khanna, 2015 A text Book of Welding Technology, 1st edition, Dhanpat Rai Publication.
4. Larry Jeffus, 2017, Welding Principles and Application, 8th edition, sense publication.

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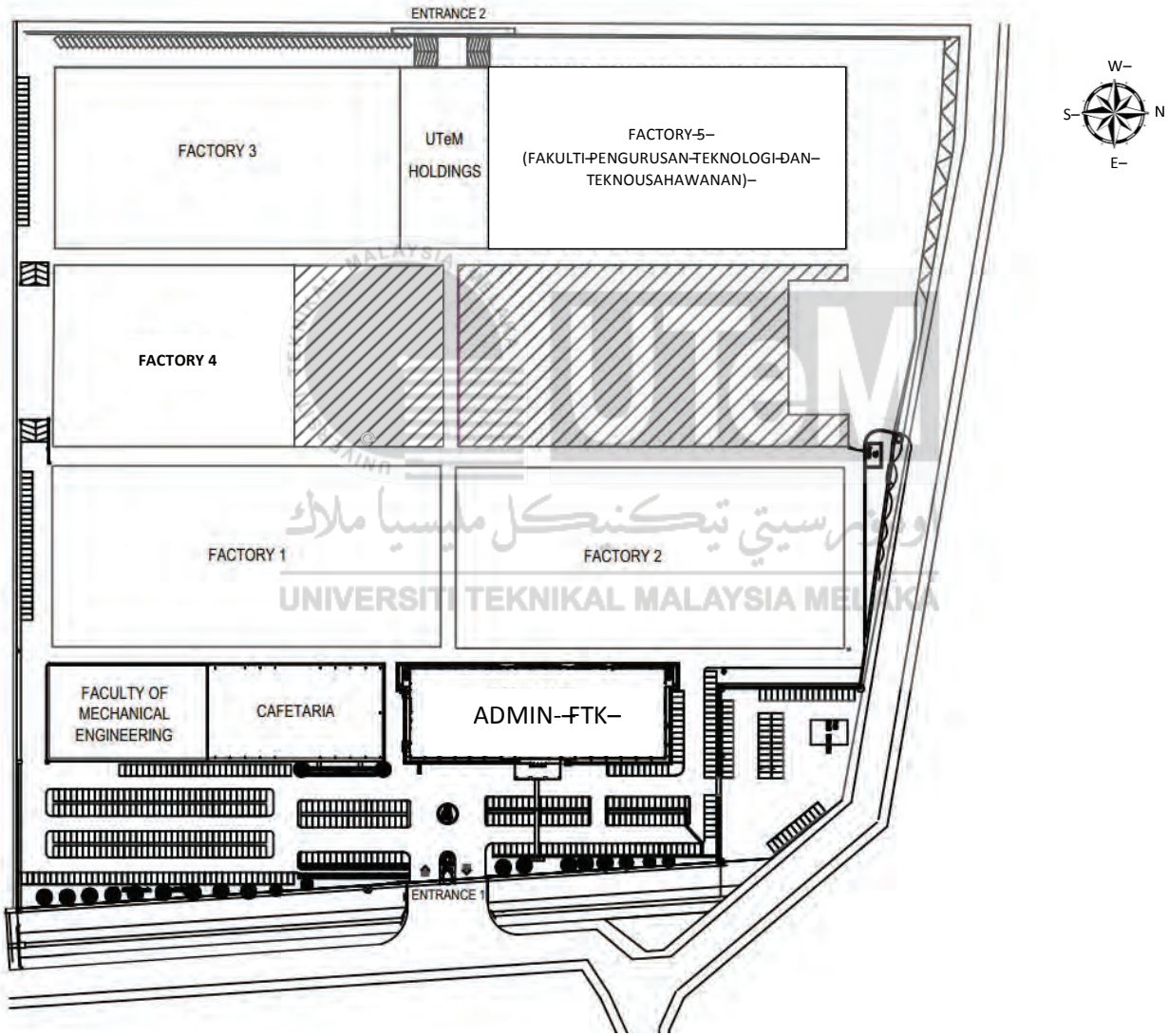
MAPS & LOCATIONS

PELAN KAMPUS TEKNOLOGI



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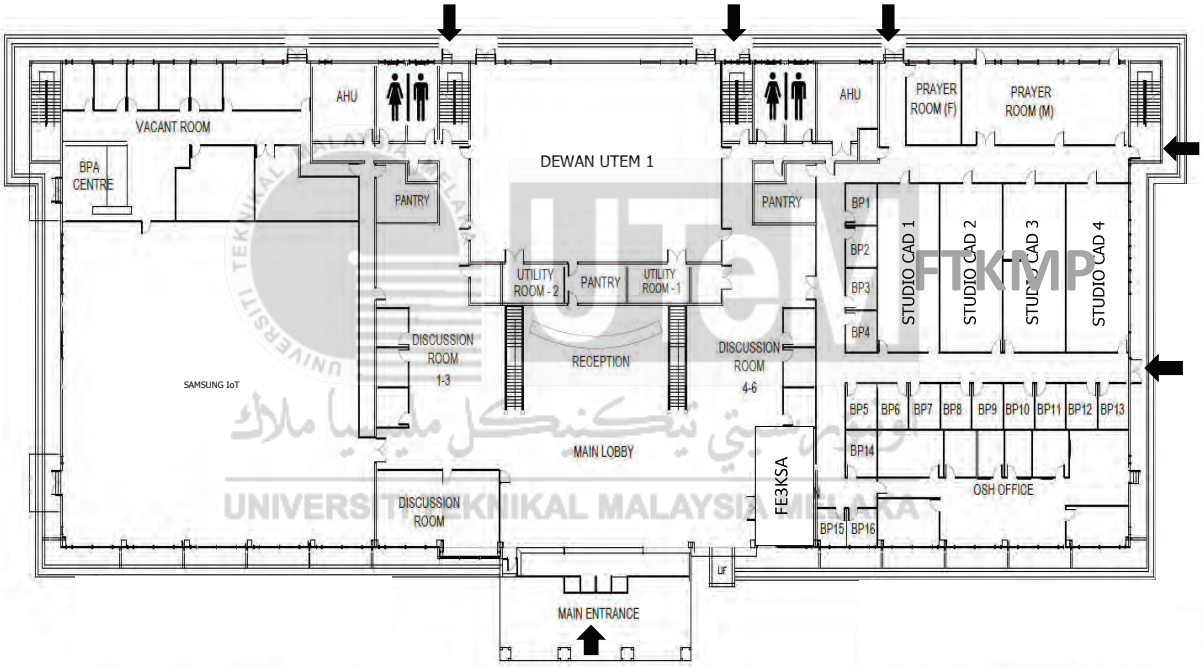
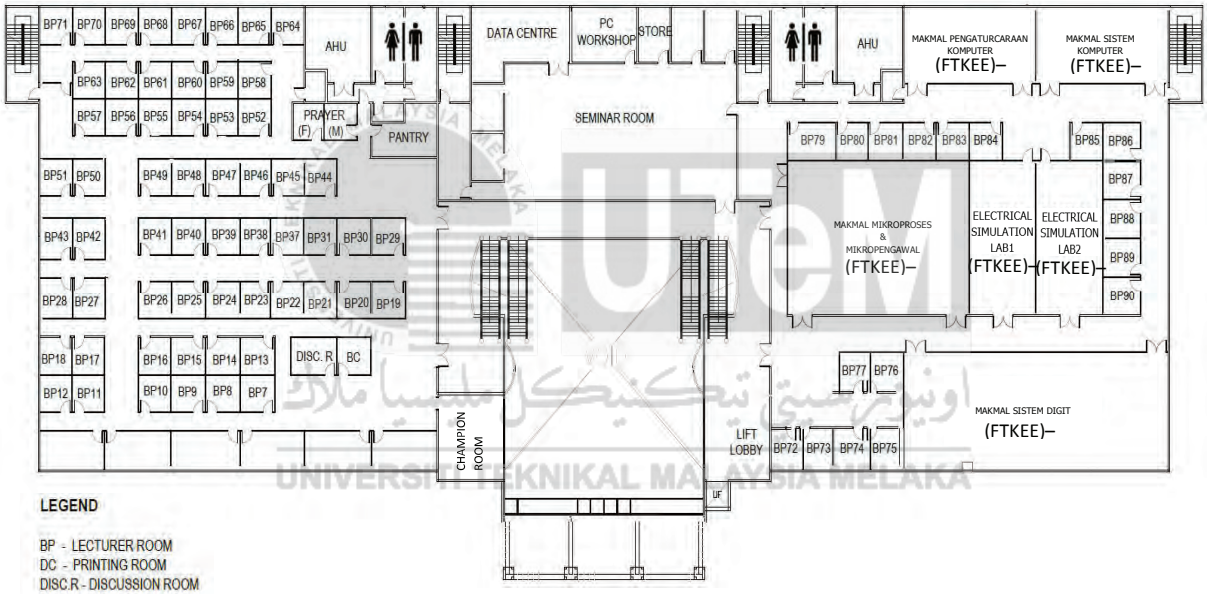


LEGEND:

BP - LECTURER ROOM
BPA - ACADEMIC ADMINISTRATION DEPARTMENT
OSH - OCCUPATIONAL SAFETY AND HEALTH

ENTRANCE-TO-BUILDING

ADMIN-FTK (ARAS 1)



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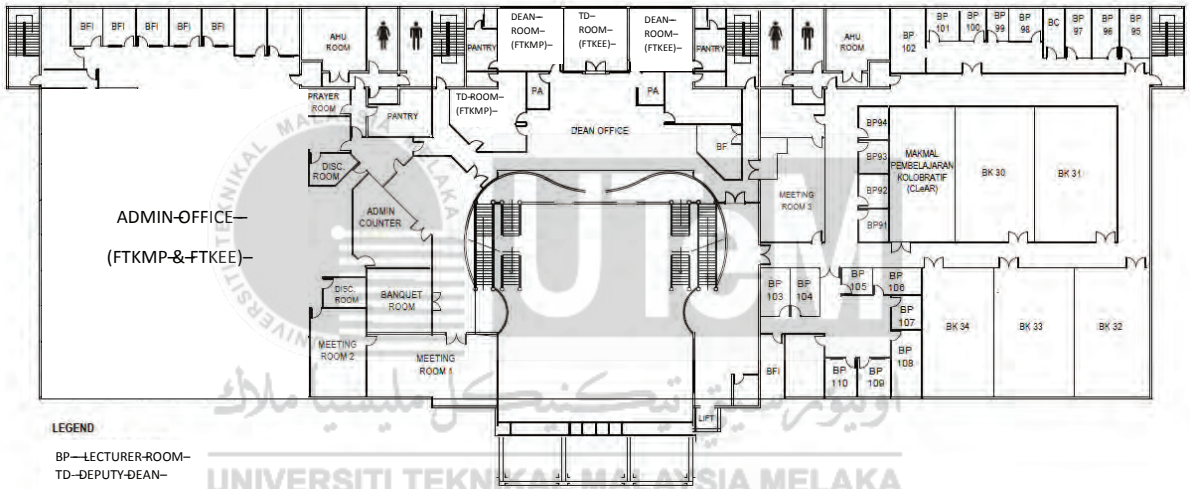

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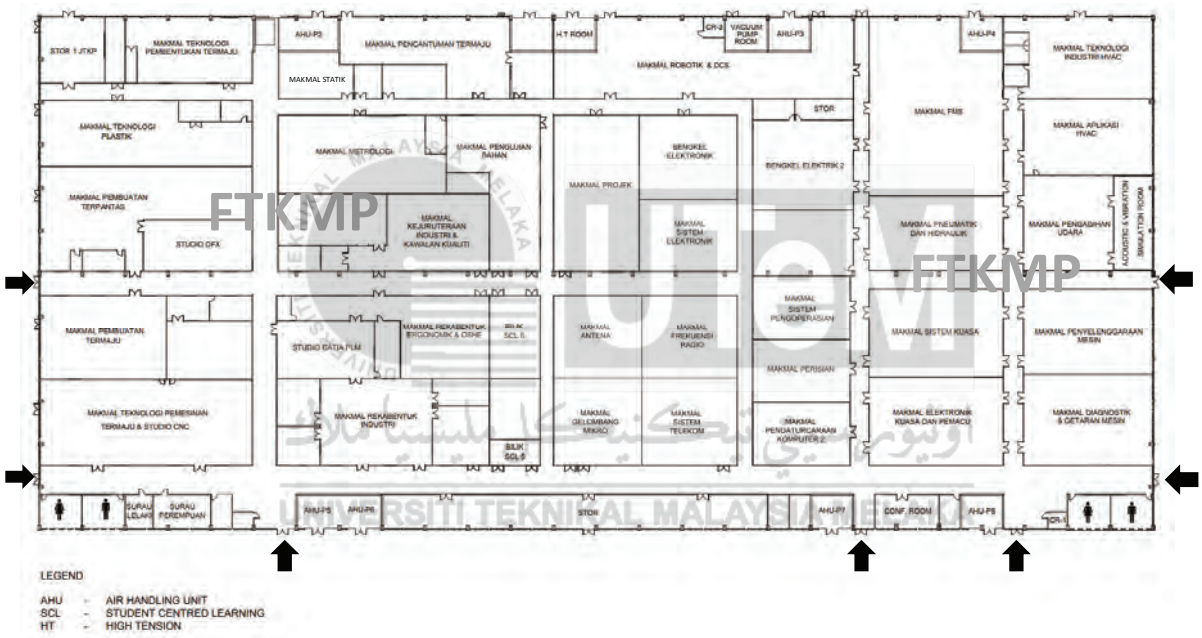
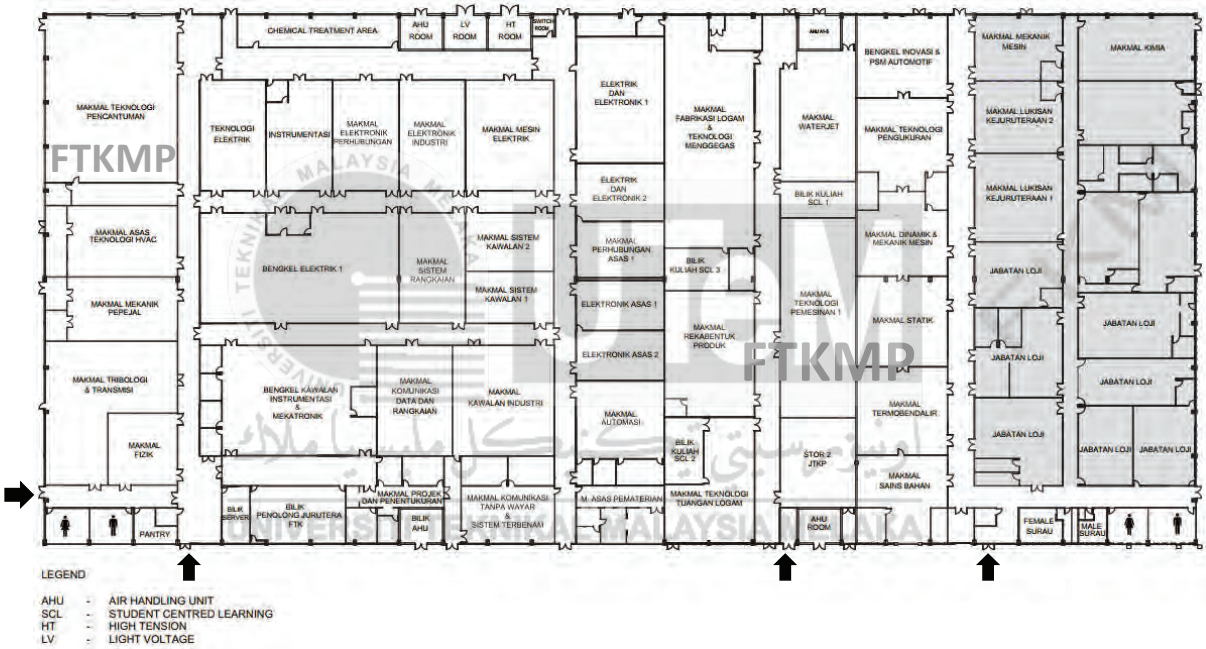
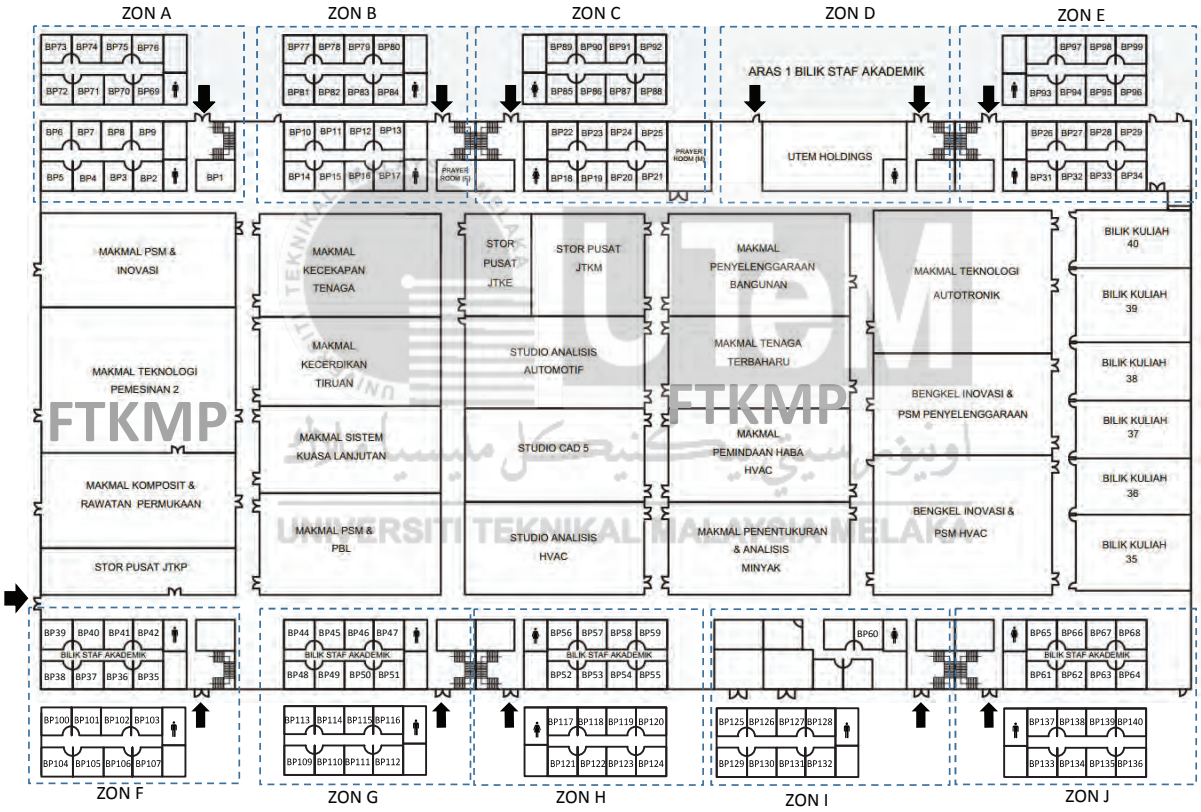

STOR 1 JTKP
MAKMAL TEKNOLOGI PEMBENTUKAN TERMAJU
AHU-P2
MAKMAL PENCANTUMAN TERMAJU
H.T ROOM
CP-2
VACUUM PUMP ROOM
AHU-P3
MAKMAL ROBOTIK & DCS
AHU-P4
MAKMAL TEKNOLOGI INDUSTRI HVAC
MAKMAL STATIK
MAKMAL TEKNOLOGI PLASTIK
MAKMAL METROLOGI
MAKMAL PENGUJIAN BAHAN
MAKMAL PROJEK
BENGKEL ELEKTRONIK
STOR
MAKMAL FMS
MAKMAL APLIKASI HVAC
MAKMAL PEMBUATAN TERPANTAS
STUDIO DFX
MAKMAL KEJURUTERAAN INDUSTRI & KAWALAN KUALITI
MAKMAL SISTEM ELEKTRONIK
BENGKEL ELEKTRIK 2
MAKMAL PNEUMATIK DAN HIDRAULIK
MAKMAL PENGABSIHAN UDARA
ACOUSTIC & VIBRATION
SIMULATION ROOM
MAKMAL PEMBUATAN TERMAJU
STUDIO DATA FILM
MAKMAL REKABENTUK ERGONOMIK & OSHE
BILIK SCL 6
MAKMAL ANTENNA
MAKMAL FREKUENSI RADIO
MAKMAL SISTEM PENGOPERASIAN
MAKMAL SISTEM KUASA
MAKMAL PENYELENGGARAAN MESIN
MAKMAL TEKNOLOGI PEMESINAN TERMAJU & STUDIO CNC
MAKMAL REKABENTUK INDUSTRI
BILIK SCL 5
MAKMAL GELOMBANG MIKRO
MAKMAL SISTEM TELEKOM
MAKMAL PERISIAN
MAKMAL PENDAIURICARAAN KOMPUTER 2
MAKMAL ELEKTRONIK KUASA DAN PEMACU
MAKMAL DIAGNOSTIK & GETARAN MESIN
SURAU LELAKI
SURAU PEREMPUAN
AHU-P5
AHU-P6
STOR
AHU-P7
CONF. ROOM
AHU-P8
LEGEND
AHU - AIR HANDLING UNIT
SCL - STUDENT CENTRED LEARNING
HT - HIGH TENSION

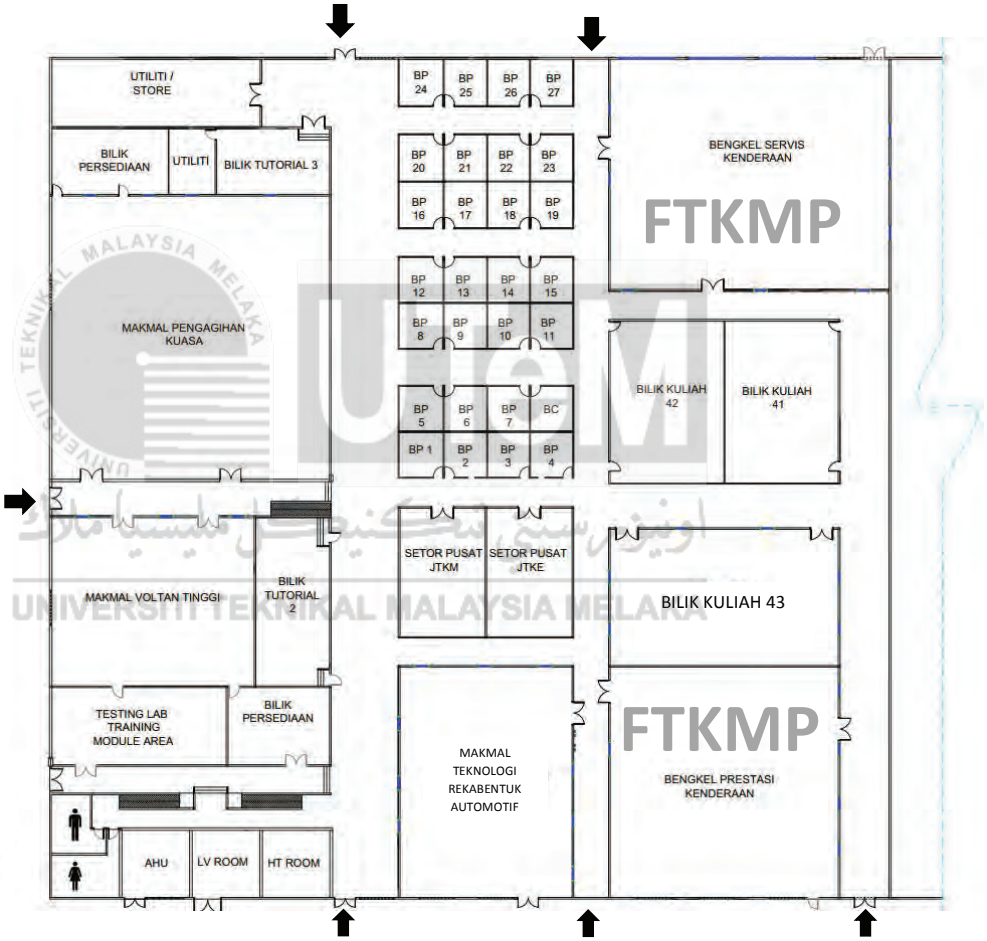
FACTORY 2


CHEMICAL TREATMENT AREA
AHU ROOM
LV ROOM
HT ROOM
SWITCH ROOM
MAKMAL TEKNOLOGI PENCANTUMAN
TEKNOLOGI ELEKTRIK
INSTRUMENTASI
MAKMAL ELEKTRONIK PERHUBUNGAN
MAKMAL ELEKTRONIK INDUSTRI
MAKMAL MESIN ELEKTRIK
ELEKTRIK DAN ELEKTRONIK 1
MAKMAL FABRIKASI LOGAM & TEKNOLOGI MENGGEGAS
MAKMAL WATERJET
BENGKEL INOVASI & PSM AUTOMOTIF
MAKMAL MEKANIK MESIN
MAKMAL KIMIA
FTKMP
MAKMAL ASAS TEKNOLOGI HVAC
BENGKEL ELEKTRIK 1
MAKMAL SISTEM RANGKAIAN
MAKMAL SISTEM KAWALAN 2
MAKMAL SISTEM KAWALAN 1
ELEKTRIK DAN ELEKTRONIK 2
MAKMAL PERHUBUNGAN ASAS 1
BILIK KULIAH SCL 3
BILIK KULIAH SCL 1
MAKMAL TEKNOLOGI PENGUKURAN
MAKMAL LUKISAN KEJURUTERAAN 2
MAKMAL LUKISAN KEJURUTERAAN 1
MAKMAL DINAMIK & MEKANIK MESIN
JABATAN LOJI
MAKMAL MEKANIK PEPEJAL
ELEKTRONIK ASAS 1
ELEKTRONIK ASAS 2
MAKMAL REKABENTUK PRODUK
MAKMAL TEKNOLOGI PEMESINAN 1
MAKMAL STATIK
MAKMAL TRIBOLOGI & TRANSMISI
BENGKEL KAWALAN INSTRUMENTASI & MEKATRONIK
MAKMAL KOMUNIKASI DATA DAN RANGKAIAN
MAKMAL KAWALAN INDUSTRI
MAKMAL AUTOMASI
MAKMAL TERMOBENDALIR
MAKMAL FIZIK
BILIK KULIAH SCL 2
STOR 2 JTKP
MAKMAL SAINS BAHAN
BILIK SERVER
BILIK PENOLONG JURUTERA FTK
MAKMAL PROJEK DAN PENENTUKURAN
BILIK AHU
MAKMAL KOMUNIKASI TANPA WAYAR & SISTEM TERBENAM
M. ASAS PEMATERIAN
MAKMAL TEKNOLOGI TUANGAN LOGAM
AHU ROOM
PANTRY
FEMALE SURAU
MALE SURAU
LEGEND
AHU - AIR HANDLING UNIT
SCL - STUDENT CENTRED LEARNING
HT - HIGH TENSION
LV - LIGHT VOLTAGE

FACTORY 3


ZON A
ZON B
ZON C
ZON D
ZON E
ARAS 1 BILIK STAF AKADEMIK
UTEM HOLDINGS
PRAYER ROOM (M)
PRAYER ROOM (F)
MAKMAL PSM & INOVASI
MAKMAL TEKNOLOGI PEMESINAN 2
MAKMAL KOMPOSIT & RAWATAN PERMUKAAN
STOR PUSAT JTKP
MAKMAL KECEKAPAN TENAGA
MAKMAL KECERDIKAN TIRUAN
MAKMAL SISTEM KUASA LANJUTAN
MAKMAL PSM & PBL
STOR PUSAT JTKE
STOR PUSAT JTKM
STUDIO ANALISIS AUTOMOTIF
STUDIO CAD 5
STUDIO ANALISIS HVAC
MAKMAL PENYELENGGARAAN BANGUNAN
MAKMAL TENAGA TERBAHARU
MAKMAL PEMINDAAN HABA HVAC
MAKMAL PENENTUKURAN & ANALISIS MINYAK
MAKMAL TEKNOLOGI AUTOTRONIK
BENGKEL INOVASI & PSM PENYELENGGARAAN
BENGKEL INOVASI & PSM HVAC
BILIK KULIAH 40
BILIK KULIAH 39
BILIK KULIAH 38
BILIK KULIAH 37
BILIK KULIAH 36
BILIK KULIAH 35
BILIK STAF AKADEMIK
ZON F
ZON G
ZON H
ZON I
ZON J

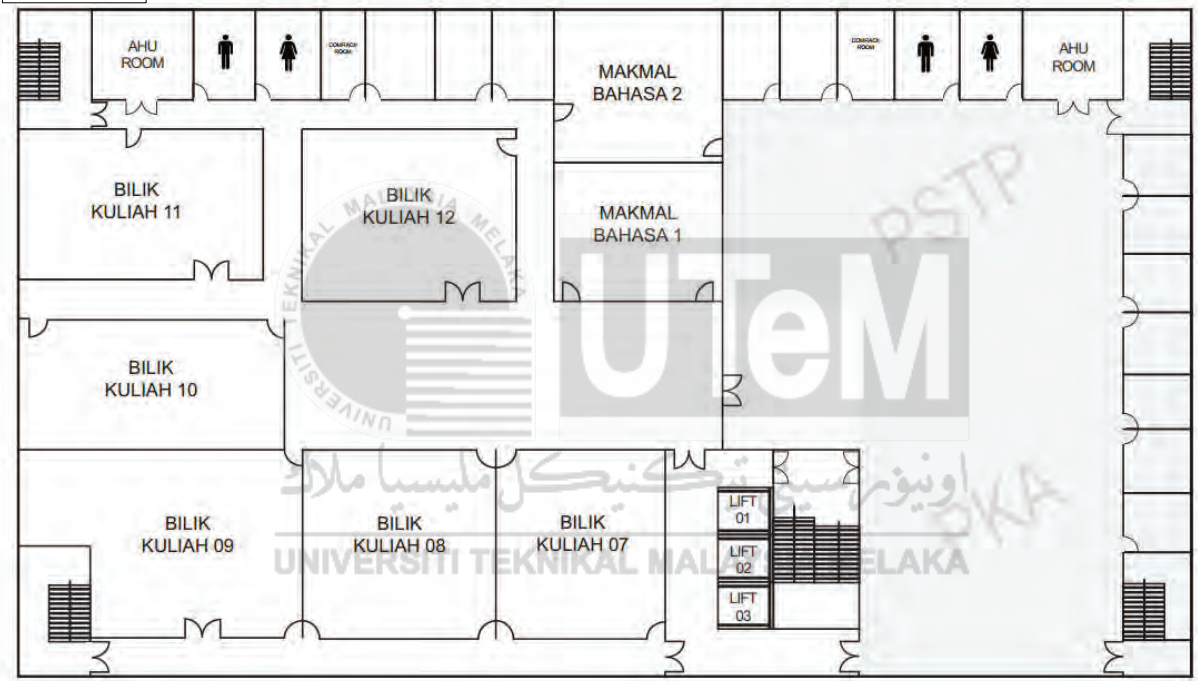
FACTORY 4



LEGEND :

HT - HIGH TENSION
LV - LIGHT VOLTAGE
BC - BILIK COMRACK
BP - BILIK PENGAJAR

FKM – ARAS 4



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