



USM UNIVERSITI
SAINS
MALAYSIA



**Pusat
Pengajian
Sains Kimia**



Pusat Pengajian Sains Kimia
School of Chemical Sciences

School Of Chemical Sciences Universiti Sains Malaysia

BACHELOR OF SCIENCE IN CHEMISTRY WITH HONOURS

Academic Session 2026/2027

<http://chem.usm.my>



WE LEAD

Transforming Higher Education for a Sustainable Tomorrow

PERSONAL DETAILS

STUDENT INFORMATION:

FULL NAME	:	
STUDENT ID	:	
EMAIL ADDRESS	:	
MOBILE NUMBER	:	
ENTRY CGPA	:	
HOME ADDRESS	:	

EMERGENCY CONTACT:

FULL NAME	:	
MOBILE NUMBER	:	

ACADEMIC ADVISOR INFORMATION:

FULL NAME	:	
MOBILE NUMBER	:	
EMAIL	:	

Main Administrative Staff

DEAN



Assoc. Prof. Dr. Mohd. Rizal Razali

DEPUTY DEANS

(Academic,
Career & International)



Dr. Ng Si Ling

(Research, Innovation & Industry
Community Engagement)



Prof. Dr. Mohamad Nasir
Mohamad Ibrahim

PROGRAMME MANAGERS

(Organic & Inorganic
Chemistry)



Dr. Yam Wan Sinn

(Analytical Chemistry)



Assoc. Prof. Dr.
Mazidahakmarn Miskam

(Physical Chemistry)



Assoc. Prof. Ts. Dr. Noor
Haida Mohd Kain

(Industrial Chemistry)



Assoc. Prof. Dr. Chua
Yong Shen

ADMINISTRATIVE OFFICERS

Principal Science Officer
(Technical & Laboratory)



Mrs. Nurul Arita Kushiar

Principal Assistant Registrar
(Undergraduates)



Mrs. Rastlene Raza Rasalingam

Senior Assistant Registrar
(Postgraduates)



Mr. Mohd Zuaril Akimi Mohd Shaari

PROGRAMME EDUCATIONAL OBJECTIVES:

- PEO 1 : Chemists who are able to apply the knowledge and practical skills acquired to improve the practice of chemistry in the public and private sectors.
- PEO 2 : Chemists who can integrate ethical and professional values in their professional and social relationships.
- PEO 3 : Chemists who can take on the roles of leaders and team members in providing solutions to chemistry-related issues and problems through effective communications with industry and society.
- PEO 4 : Chemists who are competent in digital and numerical skills and able to proactively acquire new knowledge to improve their skills in career advancement and demonstrate innovative resource and information management.

PROGRAMME LEARNING OUTCOMES:

Upon completion of this programme, students will be able to:

PO1	Knowledge (of the discipline)	Apply theoretical, conceptual, and practical knowledge within the field of chemical sciences.
PO2	Cognitive Skills	Demonstrate scientific, critical, and creative thinking in identifying and solving chemistry-related problems by using appropriate and relevant chemical knowledge and skills toward effective contributions.
PO3	Practical Skills (of the discipline)	Handle chemicals safely and comply with laboratory equipment operating procedures under supervision within a research laboratory, as well as verifying findings.
PO4	Interpersonal Skills	Demonstrate social skills, leadership, and collaboration within a team, remain sensitive to community challenges and demonstrate social responsibility for the well-being of society.
PO5	Communication Skills	Present information and findings clearly and execute effective communication.
PO6	Digital Skills	Demonstrate the ability to use digital skills in creating effective work and assignments
PO7	Numeracy Skills	Demonstrate the ability to use numeracy skills effectively in calculations involving chemical problems.
PO8	Leadership, Autonomy and Responsibility	Demonstrate the ability to work effectively as a leader.
PO9	Personal Skills	Demonstrate the ability to apply the skills and principles of lifelong learning in academic and career development.
PO10	Entrepreneurial Skills	Practice quality management systems and demonstrate relevant and appropriate entrepreneurial skills.
PO11	Ethics and Professionalism	Comply with safety requirements and regulations, legal and ethical principles, and professional codes of practice within research laboratories to balance and uphold positive values and accountability in professional and community engagement.

Bachelor of Science in Chemistry with Honours

PROGRAMME STRUCTURE

(i) Structure of Study Programme

Course Component	Unit Requirement
Core (T)	70
Elective (E)	32
University (U)	18
Total	120

For Bachelor of Science in Chemistry with Honours, students are allowed to choose between **two (2)** packages offered by the School of Chemical Sciences. **Package 1** is designed to allow the students to register for Industrial Training in the final semester (Semester 8) while **Package 2** is for the students who prefer to take open elective courses.

(ii) Industrial Training

Students are highly encouraged to apply for Industrial Training (KIE461/9) after accumulating at least 111 units.

(iii) Chemistry Project

Students are encouraged to register for Chemistry Project (KUE319/6) during their third year of studies. This involves conducting research work for 2 semesters and submitting a Chemistry Project report.

Students who do not wish to register for the Chemistry Project (KUE319/6) may fulfil the 6 credits requirement by registering for other theory courses offered by the School.

(iv) Assessment

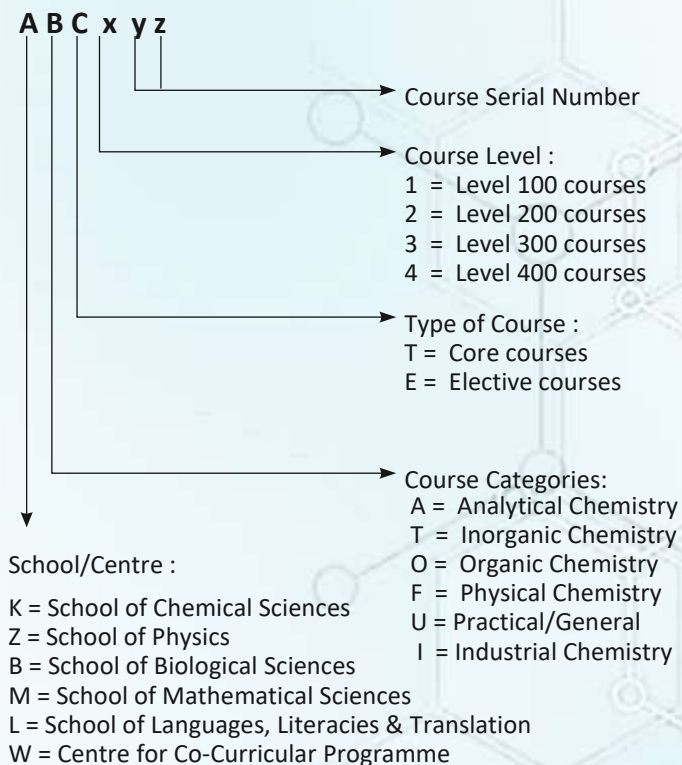
Course assessment will be based on:

- Examination
- Coursework

The cognitive, psychomotor and/or affective skills will be assessed in coursework (such as assignments, quizzes, tests, presentations, laboratory reports and practical tests) and examination.

Course Code

Each course has a course code which is made up of 3 alphabets and 3 numbers.



LIST OF COURSES OFFERED - *Package 1*

Bachelor of Science in Chemistry with Honours		
(i) Core Courses (T) - 70 Credits		
Selection of 3 Credits		Pre-requisites
ZCT103/3	Vibrations, Waves and Optics	
BOI102/3	Ecology	
BOI101/3	Organisms Biodiversity	
Compulsory - 61 Credits		Pre-requisites
MAA101/4	Calculus for Science Students 1	
KUT100/2	Safety and Security for Chemical Sustainability	
KUT101/2	General Chemistry Practical I	
KUT102/2	General Chemistry Practical II	
KTT112/4	Inorganic Chemistry I	
KOT122/4	Organic Chemistry I	
KFT133/4	Physical Chemistry I	
KAT145/4	Analytical Chemistry I	
KUT203/2	Inorganic Chemistry Practical	KUT101 (s)
KUT206/2	Organic Chemistry Practical	KUT102 (s), KOT122 (s)
KTT212/3	Inorganic Chemistry II	KTT112 (s)
KOT222/3	Organic Chemistry II	KOT122 (s)
KUT214/2	Physical Chemistry Practical	KUT102 (s), KFT234 (c)
KUT215/2	Analytical Chemistry Practical I	KUT101 (s), KAT249 (c)
KFT234/3	Physical Chemistry II	KFT133 (s)
KAT249/3	Analytical Chemistry II	KAT145 (s)
KTT313/3	Inorganic Chemistry III	KTT212 (s)
KUT306/2	Research Methodology in Chemistry	
KUT317/2	Inorganic and Analytical Chemistry Practical	KUT203 (s), KUT215 (s)
KUT318/2	Physical and Organic Chemistry Practical	KUT206 (s), KUT214 (s)
KOT323/3	Organic Chemistry III	KOT222 (s)
KFT431/3	Physical Chemistry III	KFT234 (s)
Selection of 6 Credits		
KUE319/6 or 6 credits	Chemistry Project or Other theory courses from Analytical Chemistry, Industrial Chemistry or Pure Chemistry.	

(ii) Elective Courses (E) – 32 Credits		
(a) Selection of 18 Credits or more		Pre-requisites
KIT257/3	Materials Chemistry	
KAT345/4	Spectroscopic Methods	KAT145 (s)
KIT358/3	Polymer Chemistry	KOT122 (s)
KIE359/3	Green Chemistry and Technology	
KTE411/3	Selected Topics in Inorganic Chemistry	KTT212 (s)
KOE423/3	Selected Topics in Organic Chemistry	KOT222 (s)
KFE441/3	Applied Surface Chemistry	KFT234 (s)
KAE445/3	Bioanalysis	KAT344 (s) or KAT249 (s)
KIE456/3	Food and Palm Oil Chemistry	
KIT458/3	Chemical Processing	KTT112 (s), KOT122 (s)
KIE461/9	Industrial Training	
(b) Selection of 14 Credits or less		
An additional 14 units or less to fulfill the elective component can be taken from any other Schools, not limited to School of Physics, Mathematical Sciences, Biological Sciences, or Centre for Global Archaeological Research, subject to the requirements imposed by the respective Schools. Recommended courses from School of Physics and School of Biological Sciences are:		
ZCT104/3	Physics IV (Modern Physics)	
BOI107/2	Practical of Biodiversity and Ecology	BOI101(c)
BST212/3	Tropical Ecosystem	
BST327/3	Climate Change in the Tropics	BOI102(s)
BST419/3	Sustainable Management of Natural Resources	BOI102(s), BST212(s)

*All the courses offered are subject to changes when the need arises.

(s) = sequential (Course must be taken earlier)

(c) = concurrent (Course must be taken concurrently)

Package 2

Bachelor of Science in Chemistry with Honours		
(i) Core Courses (T) - 70 Credits		
Selection of 3 Credits		Pre-requisites
ZCT103/3	Vibrations, Waves and Optics	
BOI102/3	Ecology	
BOI101/3	Organisms Biodiversity	
Compulsory - 61 Credits		Pre-requisites
MAA101/4	Calculus for Science Students 1	
KUT100/2	Safety and Security for Chemical Sustainability	
KUT101/2	General Chemistry Practical I	
KUT102/2	General Chemistry Practical II	
KTT112/4	Inorganic Chemistry I	
KOT122/4	Organic Chemistry I	
KFT133/4	Physical Chemistry I	
KAT145/4	Analytical Chemistry I	
KUT203/2	Inorganic Chemistry Practical	KUT101 (s)
KUT206/2	Organic Chemistry Practical	KUT102 (s), KOT122 (s)
KTT212/3	Inorganic Chemistry II	KTT112 (s)
KOT222/3	Organic Chemistry II	KOT122 (s)
KUT214/2	Physical Chemistry Practical	KUT102 (s), KFT234 (c)
KUT215/2	Analytical Chemistry Practical I	KUT101 (s), KAT249 (c)
KFT234/3	Physical Chemistry II	KFT133 (s)
KAT249/3	Analytical Chemistry II	KAT145 (s)
KTT313/3	Inorganic Chemistry III	KTT212 (s)
KUT306/2	Research Methodology in Chemistry	
KUT317/2	Inorganic and Analytical Chemistry Practical	KUT203 (s), KUT215 (s)
KUT318/2	Physical and Organic Chemistry Practical	KUT206 (s), KUT214 (s)
KOT323/3	Organic Chemistry III	KOT222 (s)
KFT431/3	Physical Chemistry III	KFT234 (s)
Selection of 6 Credits		
KUE319/6 or 6 credits	Chemistry Project or Other theory courses from Analytical Chemistry, Industrial Chemistry or Pure Chemistry.	

(ii) Elective Courses (E) – 32 Credits		
(a) Selection of 12 credits or more		Pre-requisites
ZCT104/3	Physics IV (Modern Physics)	BOI101(c)
BOI107/2	Practical of Biodiversity and Ecology	
BST212/3	Tropical Ecosystem	
BST327/3	Climate Change in the Tropics	BOI102(s)
BST419/3	Sustainable Management of Natural Resources	BOI102(s), BST212(s)
KAT345/4	Spectroscopic Methods	KAT145 (s)
KIT358/3	Polymer Chemistry	KOT122 (s)
KIE359/3	Green Chemistry and Technology	
KTE411/3	Selected Topics in Inorganic Chemistry	KTT212 (s)
KOE423/3	Selected Topics in Organic Chemistry	KOT222 (s)
KFE441/3	Applied Surface Chemistry	KFT234 (s)
KAE445/3	Bioanalysis	KAT344 (s) or KAT249 (s)
KIE456/3	Food and Palm Oil Chemistry	
KIT458/3	Chemical Processing	KTT112 (s), KOT122 (s)
Open Elective		
(b) Selection of 20 credits or less		
Select from any offered programme. All open elective courses offered by other Schools can be taken by students of School of Chemical Sciences, subject to the requirements imposed by the respective School which offers Open Elective programme.		

*All the courses offered are subject to changes when the need arises.

(s) = sequential (Course must be taken earlier)

(c) = concurrent (Course must be taken concurrently)

BACHELOR OF SCIENCE IN CHEMISTRY WITH HONOURS - Package 1

YEAR 1					
COMPONENT	SEMESTER 1		SEMESTER 2		CREDIT
	CODE	CREDIT	CODE	CREDIT	
University Courses (U)	¹ WUS101	2	³ WAR122	2	
	² SHE102	2			
Core Courses (T)	KAT145	4	KFT133	4	
	KTT112	4	KOT122	4	
	KUT101	2	KUT102	2	
	KUT100	2	MAA101	4	
			BOI101* (Optional)	3*	
TOTAL CREDIT		16		16/19*	32/35*

Note: ¹ Local students– WUS101/2; International students– U course.

² Local students– SHE102/2; International students– SHE103E/2.

³ Local students– WAR122/2; International students– WAR123E/2.

* Students can choose from BOI101/3, ZCT103/3 or BOI102/3.

YEAR 2					
COMPONENT	SEMESTER 3		SEMESTER 4		CREDIT
	CODE	CREDIT	CODE	CREDIT	
University Courses (U)			⁵ HFF226	2	
	U	2	⁶ LKM400	2	
Core Courses (T)	KOT222	3	KTT212	3	
	KAT249	3	KFT234	3	
	KUT203	2	KUT206	2	
	KUT215	2	KUT214	2	
Elective (E)	Elective	3	Elective	3	
Prerequisite Courses (Z)	⁴ LSP201	2			
TOTAL CREDIT		15		17	32

Note: ⁴ If MUET is 3.5 & below/ TOEFL 40 & below/ IELTS 5.0 & below/ PTE 47 & below.

⁵ Local students– HFF226/2; International students– SHE104E/2.

⁶ Local students– LKM400/2; International students– LKM100/2.

YEAR 3					
COMPONENT	SEMESTER 5		SEMESTER 6		CREDIT
	CODE	CREDIT	CODE	CREDIT	
University Courses (U)	⁴ LSP301	2	U (ko-k)	2	
Core Courses (T)	KTT313	3	KOT323	3	
	KUT317/ KUT318	2	KUT317/ KUT318	2	
	BOI102/ZCT103* (Optional)	3*	KUE319	3	
			KUT306	2	
Elective (E)	Elective	3	Elective	2	
	Elective	3	Elective	3	
TOTAL CREDIT		13/16*		17	30/33*

Note: ⁴If MUET is 3.5 & below/ TOEFL 40 & below/ IELTS 5.0 & below/ PTE 47 & below.

*Students can choose from BOI101/3, ZCT103/3 or BOI102/3.

YEAR 4					
COMPONENT	SEMESTER 7		SEMESTER 8		CREDIT
	CODE	CREDIT	CODE	CREDIT	
University Courses (U)	U	2			
Core Courses (T)	KUE319	3			
	KFT431	3			
Elective (E)	Elective	3	KIE461: Industrial Training for 1 Semester (18 weeks) with Industry/ Government Agency/ Private Company	9	
	Elective	3			
TOTAL CREDIT		14			23
GRAND TOTAL CREDIT HOURS					120

BACHELOR OF SCIENCE IN CHEMISTRY WITH HONOURS - Package 2

YEAR 1					
COMPONENT	SEMESTER 1		SEMESTER 2		CREDIT
	CODE	CREDIT	CODE	CREDIT	
University Courses (U)	¹ WUS101	2	³ WAR122	2	
	² SHE102	2			
Core Courses (T)	KAT145	4	KFT133	4	
	KTT112	4	KOT122	4	
	KUT101	2	KUT102	2	
	KUT100	2	MAA101	4	
			BOI101* (Optional)	3*	
TOTAL CREDIT		16		16/19*	32/35*

Note: ¹ Local students– WUS101/2; International students– U course.

² Local students– SHE102/2; International students– SHE103E/2.

³ Local students– WAR122/2; International students– WAR123E/2.

*Students can choose from BOI101/3, ZCT103/3 or BOI102/3.

YEAR 2					
COMPONENT	SEMESTER 3		SEMESTER 4		CREDIT
	CODE	CREDIT	CODE	CREDIT	
University Courses (U)	U	2	⁵ HFF226	2	
			⁶ LKM400	2	
Core Courses (T)	KOT222	3	KTT212	3	
	KAT249	3	KFT234	3	
	KUT203	2	KUT206	2	
	KUT215	2	KUT214	2	
Elective (E)	Elective	4	Elective	3	
Prerequisite Courses (Z)	⁴ LSP201	2			
TOTAL CREDIT		16		17	33

Note: ⁴ If MUET is 3.5 & below/ TOEFL 40 & below/ IELTS 5.0 & below/ PTE 47 & below.

⁵ Local students– HFF226/2; International students– SHE104E/2.

⁶ Local students– LKM400/2; International students– LKM100/2.

YEAR 3					
COMPONENT	SEMESTER 5		SEMESTER 6		CREDIT
	CODE	CREDIT	CODE	CREDIT	
University Courses (U)	⁴ LSP301	2	U	2	
Core Courses (T)	KTT313	3	KUE319	3	
	KUT317/ KUT318	2	KUT306	2	
	BOI102/ ZCT103* (Optional)	3*			
Elective (E)	Elective	4	Elective	4	
	Elective	3	Elective	4	
TOTAL CREDIT		14/17*		15	29/32*

Note: ⁴ If MUET is 3.5 & below/ TOEFL 40 & below/ IELTS 5.0 & below/ PTE 47 & below.

*Students can choose from BOI101, ZCT103/3 or BOI102/3.

YEAR 4					
COMPONENT	SEMESTER 7		SEMESTER 8		CREDIT
	CODE	CREDIT	CODE	CREDIT	
University Courses (U)			U	2	
Core Courses (T)	KUE319	3	KOT323	3	
	KFT431	3	KUT317/ KUT318	2	
Elective (E)	Elective	3	Elective	3	
	Elective	4			
TOTAL CREDIT		13		10	25
GRAND TOTAL CREDIT HOURS					120

UNIVERSITY COURSE REQUIREMENTS

Students are required to take 18 credits for the following University courses/options for University needs:

UNIVERSITY COURSE REQUIREMENTS		CREDIT TOTAL	
		Local Students	International Students
General Studies (MPU)			
U1	<u>Local Students</u> - HFF226 (Philosophy and Current Challenges) (2 credits) - SHE102 (Malaysian Nation -State Aspiration (2 credits) - WAR122 (Integrity and Anti-Corruption) (2 credits) <u>International Students of Science and Technology</u> - SHE103E (Malaysian Citra 1) (2 credits) - Malay Language course (2 credits) - WAR123E (Integrity and Anti-Corruption) (2 credits) <u>International Students of Arts</u> <i>(program with Malay Language as the medium of instruction)</i> - SHE103E (Malaysian Citra 1) (2 credits) - LKM100 (Malay Language I) (Z) - LKM200 (Malay Language II) (U) (2 credits) - WAR123E (Integrity and Anti-Corruption) (2 credits) <u>International Students of Arts</u> <i>(program with English Language as the medium of instruction)</i> - SHE103E (Malaysian Citra 1) (2 credits) - LKM100 (Malay Language I) (U) (2 credits) - WAR123E (Integrity and Anti-Corruption) (2 credits)	6	6
U2	<u>Local Students</u> - LKM400 (Malay Language IV) (2 credits) - English Language Course (2 credits)* <u>International Students</u> - English Language Course (2 credits)*	4	2
U3	<u>Local Students</u> - WUS101 (Core Entrepreneurship) (2 credits) <u>International Students</u> - SHE104E (Malaysian Citra 2) (2 credits)	2	2
U4	<u>Local Students</u> Co-Curricular Courses* <u>International Students</u> Co-Curricular Courses*	2	2
Options	Students can/have to choose any of the following: - Co-curricular courses - Skill courses/Foreign Language Courses/ Other courses offered by other schools	4	6
CREDIT TOTAL		18	18

OUR VISION

To realise the aspiration of Universiti Sains Malaysia in Transforming Higher Education for a Sustainable Tomorrow.

OUR MISSION

To produce chemistry graduates who are knowledgeable, highly skilled, well mannered and possess excellent work ethics suited for the requirements of the public and industrial sectors.

- To provide quality chemistry students with quality education.
- To instil awareness among chemistry students towards the welfare of the society.
- To provide modern facilities for chemistry teaching and research.
- To attract excellent students from Malaysia and overseas to embrace chemistry at USM.

GRADE POINT AVERAGE SYSTEM (GPA)

GRADE	GRADE POINT
A	4.00
A-	3.67
B+	3.33
B	3.00
B-	2.67
C+	2.33
C	2.00
C-	1.67
D+	1.33
D	1.00
D-	0.67
F	0.00

PNG>2.00: ACTIVE

CREDIT PER SEMESTER:

- Minimum : 9 Units
- Maximum : 20 Units

PNG<1.99: P1, P2, FO

- Not allowed for e-registration
- P1 : Maximum : 12 Units
- P2 : Maximum : 10 Units

SCHOOL OF CHEMICAL SCIENCES, UNIVERSITI SAINS MALAYSIA

YEAR	1				2				3				4				TOTAL
SEMESTER	I	Units	II	Units	I	Units	II	Units	I	Units	II	Units	I	Units	II	Units	
CORE (T)																	
ELECTIVE (E)																	
UNIVERSITY (U)																	
PREREQUISITE COURSES (Z)																	
TOTAL																	
PNG																	
PNG-AT																	
PNGK																	
STUDENT'S SIGNATURE																	

YEAR 1	SEMESTER I	SEMESTER II
COMMENTS BY ACADEMIC ADVISOR		
ACADEMIC ADVISOR'S SIGNATURE		
STUDENT'S SIGNATURE		
DATE		

YEAR 2	SEMESTER I	SEMESTER II
COMMENTS BY ACADEMIC ADVISOR		
ACADEMIC ADVISOR'S SIGNATURE		
STUDENT'S SIGNATURE		
DATE		

YEAR 3	SEMESTER I	SEMESTER II
COMMENTS BY ACADEMIC ADVISOR		
ACADEMIC ADVISOR'S SIGNATURE		
STUDENT'S SIGNATURE		
DATE		

YEAR 4	SEMESTER I	SEMESTER II
COMMENTS BY ACADEMIC ADVISOR		
ACADEMIC ADVISOR'S SIGNATURE		
STUDENT'S SIGNATURE		
DATE		



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others/current-undergraduate](https://chem.usm.my/index.php/others/current-undergraduate)

SCHOOL OF CHEMICAL SCIENCES

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