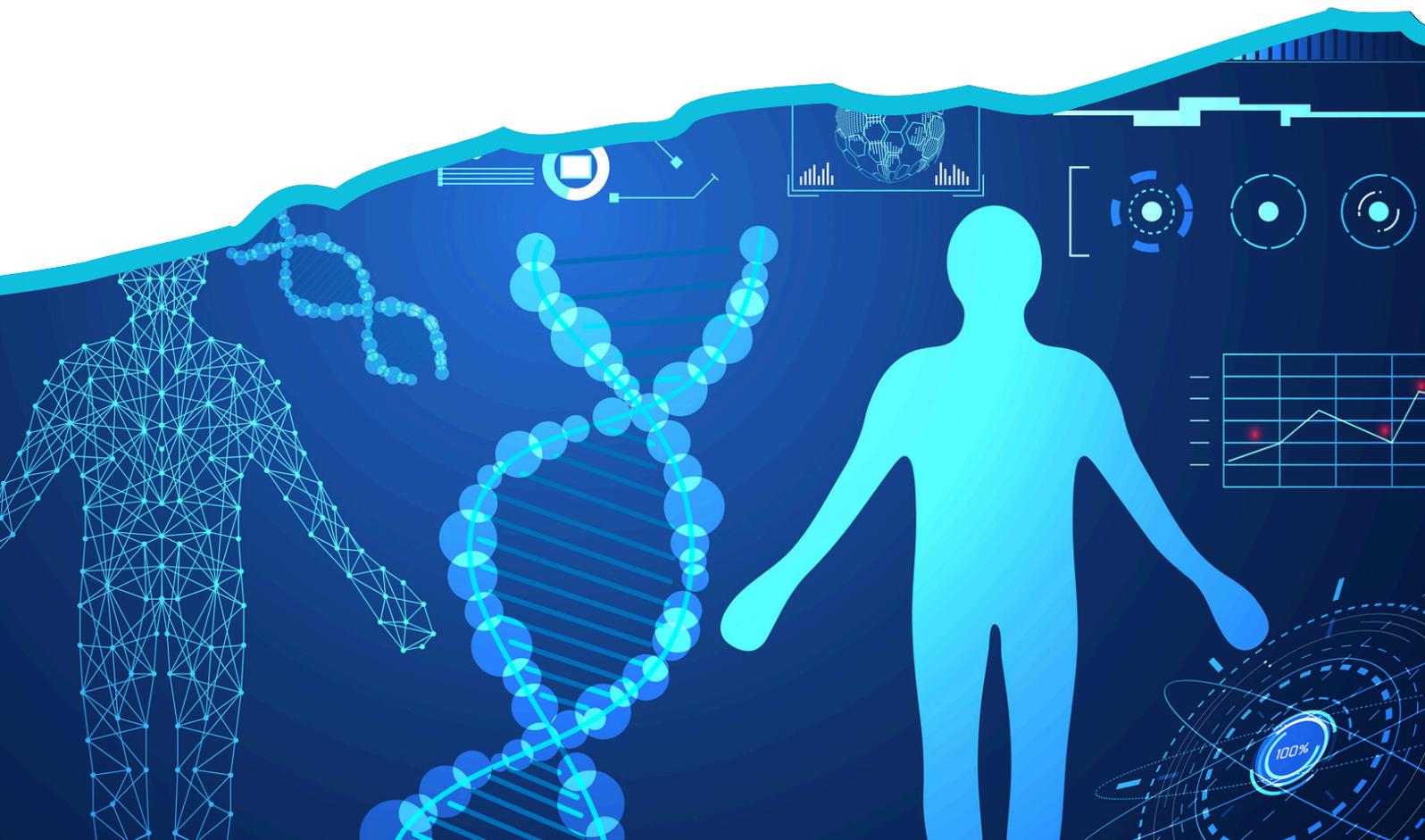




SCHOOL OF PHYSICS | UNIVERSITI SAINS MALAYSIA

**BACHELOR OF APPLIED
SCIENCE IN MEDICAL
PHYSICS WITH HONOURS**

2025/2026 ACADEMIC SESSION



Academic Handbook
Bachelor of Applied Science in Medical Physics with Honours
Academic Session 2025/2026

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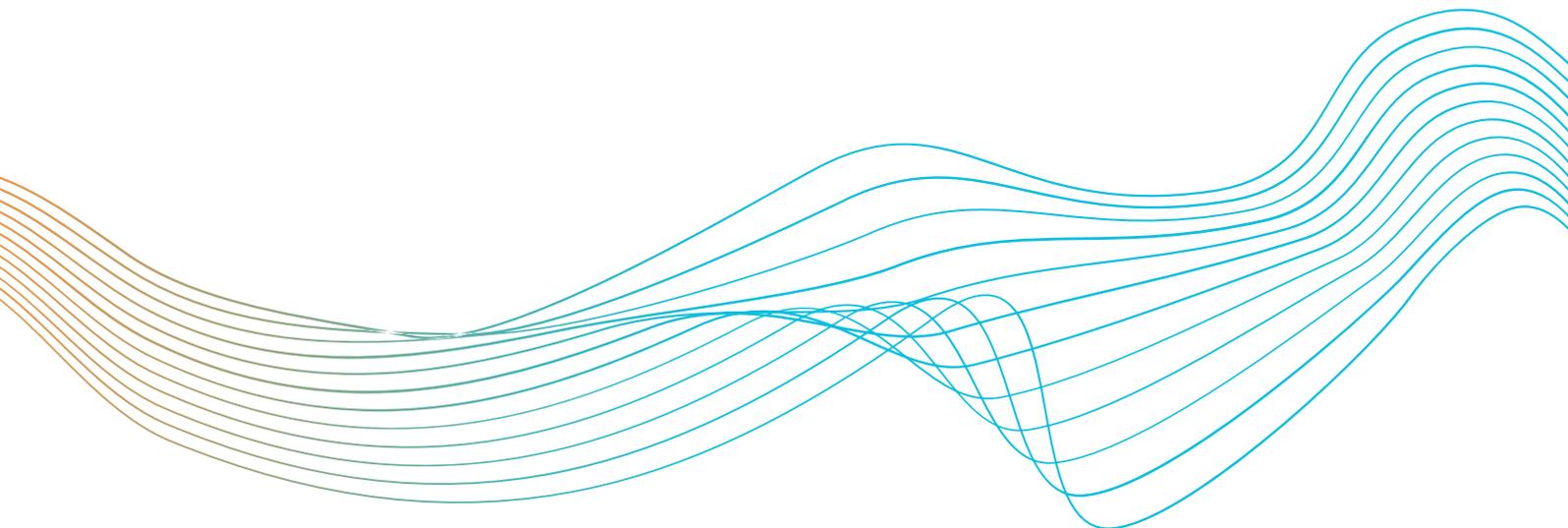


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VISION & MISSION

Vision

Transforming Higher Education for a Sustainable Tomorrow

Mission

USM is a pioneering, transdisciplinary research intensive university that empowers future talents and enables the bottom billions to transform their socio-economic well-being

USM

School
of
Physics

Vision

Towards global excellence in transdisciplinary research and education in Physics

Mission

To provide academic, research, educational and social programs for the development of human capital, knowledge, and technology for a sustainable nation

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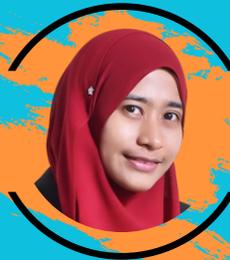
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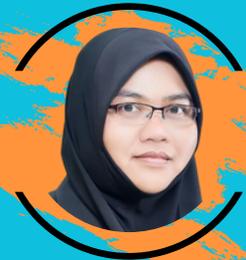
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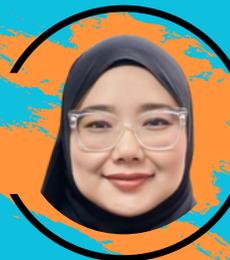
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OVERVIEW

The School of Physics, which occupies Buildings G06, G06A and G05, was one of the three Schools that was set up when the University was established in the year 1969. The School has since grown and evolved since its inception, and now emerges as one of the leading schools in USM, garnering a national reputation in X-Ray Crystallography and Nano-Optical research, whilst diversifying the thrust through the establishment of research groups, namely, Condensed Matter Physics and X-Ray Crystallography; Applied and Engineering Physics; Energy Studies; Geophysics, Astronomy and Atmospheric Science; Theoretical and Computational Physics; and Medical Physics and Radiation Science.

The School of Physics offers the following three undergraduate academic programs:

- Physics
- Geophysics
- Medical Physics

The main objective of the School of Physics is to produce Physics and Applied Physics graduates who are high achievers, skilful in many areas, both scientific and non-technical and possess excellent knowledge suitable to national needs. Studying Physics can help students to develop a range of skills including problem-solving, reasoning, numeracy, practical skills, communication, and information and communication technology (ICT).

Programme Overview

The Bachelor of Applied Science in Medical Physics with Honours is a 4-year undergraduate program offered by the School of Physics, USM, focusing on applying physics principles—especially radiation physics, medical imaging, and therapeutic technology—to support healthcare diagnostics and treatment. Students gain theoretical knowledge in physics and mathematics alongside hands-on learning in medical imaging, radiotherapy, laboratory work, and a two-semester final-year medical physics project.

PROGRAMME EDUCATION OBJECTIVES

01

To train adequate human capital in the Medical Physics area and to increase the utilization of high technology medical equipment

02

To expose and increase students' knowledge in radiation physics, dosimetry, medical instrumentation, diagnostic imaging modalities, radiotherapy and nuclear medicine

03

To train medical physics students to have good analytical skills and able to understand and solve problems related to their field

04

To produce graduates who are versatile to serve in different fields of applied physics other than Medical Physics



PROGRAMME LEARNING OUTCOMES

- Understand fundamental and broad principles of physics, in particular on radiation physics and dosimetry, medical instrumentations, diagnostic imaging modalities, radiotherapy and nuclear medicine 01
- 02 Demonstrate logical reasoning and critical thinking in scientific matters and issues related to medical physics
- Perform the procedures required by medical physicist 03
- 04 Demonstrate interpersonal skills, social responsibilities and value cultural diversity in leading an effective teamwork
- Attain team communication, team working and other related skills 05
- 06 Acquire diversified skills related to technological literacy
- Solve numerical problem related to medical physics 07
- 08 Demonstrate the ability to be a skilled and innovative leader
- Articulate, locate and apply resources independently 09
- 10 Demonstrate self-reliant and able to manage and guide effectively in matters related to scientific tasks
- Adhere to professionalism, values, ethics and observe accountability in execution of tasks 11

PROGRAMME STRUCTURE

Type	Code	Credit Unit
Core	T	74
[A] Elective or [B] Elective + Open Elective	E	31 or 15 + 16
University	U	18
Total		123

Students may choose a Bachelor of Applied Science Degree with a combination of either:

- [A] Major in Medical Physics taken with Elective courses; or
- [B] Major in Medical Physics taken with Elective and Open Elective courses

OPEN ELECTIVE COURSES

Students may choose up to 16 units of open elective courses from the Physics programme, and the remaining 15 units from the elective courses listed within this programme.

Students may also register for elective courses offered by other Schools, subject to the specific requirements set by the respective Schools. Some Schools may offer up to 20 units of elective courses; therefore, students are advised to consult the respective School for further information on the courses available.

CORE COURSES

No.	Course Code	Course Name	Semester Offered	Pre-requisite Course
1	ZCA101/4	Mechanics	1	
2	ZCA102/4	Physics II (Electricity and Magnetism)	2	
3	ZCT103/3	Vibrations, Waves and Optics	1	
4	ZCT104/3	Physics IV (Modern Physics)	2	
5	ZCT106/3	Electronics I	2	(C) ZCA102/4
6	*ZCA110/4	Calculus	1	
7	ZCT191/2	Physics Practical I	1	
8	ZCT192/2	Physics Practical II	2	
9	ZCT205/3	Quantum Mechanics	2	(S) ZCT104/3
10	ZCT210/4	Complex Analysis and Differential Equations	1	(S) ZCA110/4 or (S) MAA101/4
11	ZCT214/3	Thermodynamics	1	(S) ZCA102/4
12	ZCT215/3	Optics	1	(S) ZCT103/3
13	ZMT231/4	Human Anatomy and Physiology	2	
14	ZMT234/4	Physics of Diagnostic Radiology	2	(S) ZCT104/3
15	ZCT293/2	Physics Practical III	1	(S) ZCT191/2 or (S) ZCT192/2
16	ZMT298/2	Medical Physics Practical	2	(S) ZCT293/2
17	ZCT307/3	Solid State Physics I	1	(S) ZCT205/3

No.	Course Code	Course Name	Semester Offered	Pre-requisite Course
18	ZCT314/3	Statistical Mechanics	1	(S) ZCT214/3
19	ZMT332/3	Physics of Radiotherapy	2	(S) ZCT104/3
20	ZMT333/3	Nuclear Medicine	1	(S) ZCT104/3
21	ZMT397/8	Medical Physics Project (two semesters)		(S) MAT181/4 or (S) ZCE111/4 and (S) ZMT298/2
22	ZMT431/4	Radiation Biophysics	1	(S) ZCT104/3

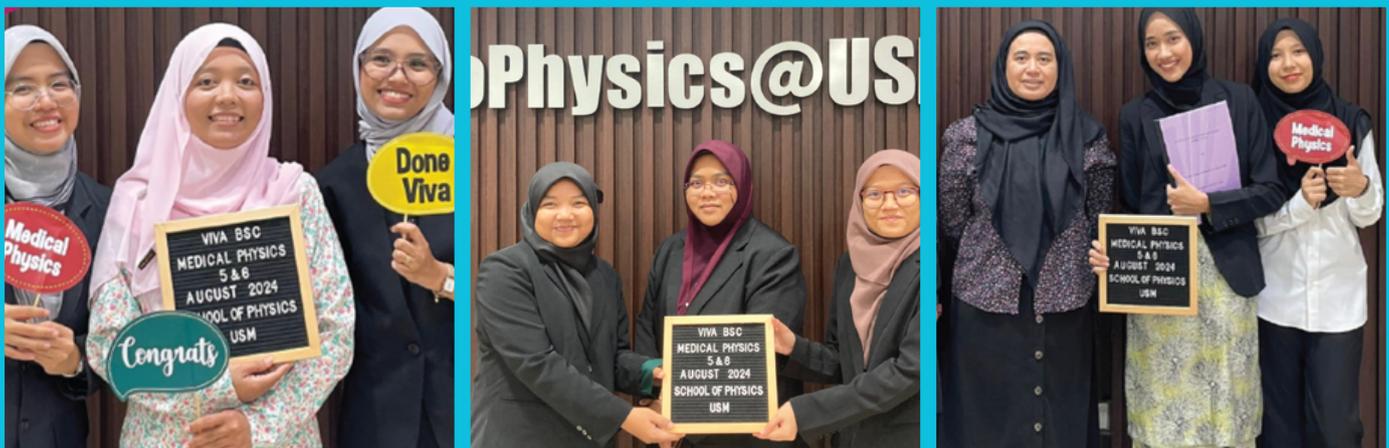
*The course content of ZCA 110/4 overlaps with Mathematics course MAA 101/4 Calculus for Student Science I. Students can only register either ZCA 110/4 or MAA 101/4.

Notes:

P : Pass (Grade C and above)

S : Sequential (course must be taken earlier)

C : Concurrent (course must be taken concurrently)



ELECTIVE COURSES

No.	Course Code	Course Name	Semester Offered	Pre-requisite Course
[A] Select all 31 units from here or select 27 units and the remaining 4 units from Part [B]				
1	ZCE111/4	Computational Approach in Physics Learning	2	
2	ZCT112/3	Linear Algebra and Vector Analysis	2	(S) ZCA110/4 or (S) MAA101/4
3	ZCE275/4	Introduction to Astronomy	1	
4	ZCE277/4	Structure of the Universe	2	
5	ZCE305/3	Atomic and Nuclear Physics	1	(S) ZCT205/3
6	ZCE321/3	Engineer in Society	1	
7	ZME336/4	Medical Instrumentation	1	(S) ZCT106/3
8	ZCE341/4	Energy Studies	2	(S) ZCA101/4 and (S) ZCA102/4
9	ZGT374/4	Remote Sensing	1	(S) ZCA102/4 and (S) ZCA103/3
10	ZCE376/4	Astronomy Principles and Practices	1	
11	ZCE378/4	Radio Astronomy	2	
12	ZAT386/4	Physics of Semiconductor Devices	2	(S) ZCT106/3 and (S) ZCT307/3
13	ZCE401/3	Quantum Mechanics II	1	(S) ZCT205/3
14	ZME432/4	Medical Laser	2	(S) ZCT104/3
15	ZME438/4	Physics of Medical Imaging	1	(S) ZCT106/3
16	ZCE451/3	X-ray Analysis	1	(S) ZCT307/3
17	ZAE484/4	Laser Technology and Its Application	2	(S) ZCT104/3
18	ZAE485/4	Applied Spectroscopy	1	(S) ZCT215/3
19	ZAE488/4	Non-Destructive Testing	2	(S) ZCT104/3
20	ZCE499/12	Industrial Training	2	(S) ZCT398/8 or (S) ZMT397/8 or (S) ZGT395/8

[B] Recommended selection (but not limited to this) from other Science or Applied Science programmes[∞], not from the School of Physics (maximum 4 units)

1 MAA161/4 Statistics for Science Students

[∞]For details, refer to the School concerned.

All the courses offered are subject to changes should the need arise.

RECOMMENDED SCHEDULE BY SEMESTER
BACHELOR OF APPLIED SCIENCE IN MEDICAL PHYSICS WITH HONOURS

COMPONENTS	YEAR 1		YEAR 2		YEAR 3		YEAR 4		Total Cr
	SEM 1	SEM 2	SEM 1	SEM 2	SEM 1	SEM 2	SEM 1	SEM 2	
	Code/Cr	Code/Cr	Code/Cr	Code/Cr	Code	Code/Cr	Code/Cr	Code/Cr	
Core courses (T)	ZCA101/4 ZCT103/3 ZCA110/4 ZCT191/2	ZCA102/4 ZCT104/3 ZCT106/3 ZCT192/2	ZCT210/4 ZCT214/3 ZCT215/3 ZCT293/2	ZCT205/3 ZMT231/4 ZMT298/2 ZMT234/4	ZCT307/3 ZCT314/3 ZMT397/4 ZMT431/4 ZMT333/3	ZMT332/3 ZMT397/4			74
Elective (E) courses		ZCE111/4 or MAT181/4				#/3 #/4	#/4 #/4	ZCE499/12 or @/12	31
University courses (U)	WUS101/2 U*/2	U*/2	HFF225/2 U*/2	HFE224/2 U*/2	U*/2		U*/2		18
Total Credit Hours	17	18	16	17	19	14	10	12	123

Notes:

U* : for details, see Chapter 3 of the BPRP

: Choose any from List of Elective Courses

@ : Choose any 400 level courses from List of Elective Course

INDUSTRIAL TRAINING PROGRAMME

Industrial training, which is optional, is highly encouraged. Industrial Training lasts for 24 weeks, done in Semester 2 of the 4th year of study. The purpose of Industrial Training is to strengthen the relationship between the University and the private and public sectors and provide exposure to working life for students nearing their completion of undergraduate study. Students will be directly exposed to the real working environment. Students in the final year are encouraged to apply to serve as trainees with various employers in industries, hospitals, or institutions relevant to their fields of study through the School of Physics.

During the period of training, it is hoped that students will observe and participate in the research and management activities in the industry and implement theories of science learned. Evaluation will be done based on the report from the industrial supervisor/field supervisor, industrial training reports including logbook, and presentation. Students may opt out of Industrial Training provided substitute courses are taken with total unit equivalent to 12 of courses at the 400 level.

GRADUATION REQUIREMENTS

Students must fulfil the following requirements to graduate:

- [a] Fulfil all the credit requirements of the course and required units for each component [Core, Elective, Option and University Courses].
- [b] Obtain a CGPA of 2.00 and above for Core Components.
- [c] Obtain a CGPA of 2.00 and above for the programme.
- [d] Achieve a minimum grade C or a grade point of 2.00 for Bahasa Malaysia, English Language, Philosophy and Current Issues (HFF225/2) and Appreciation of Ethics and Civilization (HFE224/2) courses.
- [e] Achieve a minimum grade C or a grade point of 2.00 for certain courses [if required].



ACADEMIC INTEGRITY

"Integrity without knowledge is weak and useless. Knowledge without integrity is dangerous and dreadful." - Samuel Johnson

Academic honesty is important because it is the main pillar in ensuring that manners and ethics with regards to higher education integrity are preserved.

Universiti Sains Malaysia encourages its students to respect and ensure that any matter relating to academic integrity are well-preserved. Universiti Sains Malaysia always encourages its students to ensure that manners, ethics and integrity would be essential in academics while focusing on their studies in Universiti Sains Malaysia.

The following are practices or acts that are considered as conducts of lack of integrity in academics:

1. Cheating

Cheating in the academic context includes copying during examination, usage of information without authorization or in a dishonest manner. There are numerous ways and methods of cheating which include among others:

- Copying answers from others during tests or exams.
- Any suspicious action that can be described as cheating or an attempt to cheat in an exam.
- Using unauthorized materials or devices without authorization such as hand-written notes or any smart electronic device during test or exam.
- Asking or allowing another student to take a test or exam on behalf and vice-versa.
- Sharing answers in assignments or projects.
- Purposely tampering with the marks/grade given in any course work, and then re-submit it for remarking/regrading.
- Give the command, to force, persuade, deceive or threaten others to conduct research, writing, programming or any task for a student's personal gain.
- Submitting any identical or similar work in more than one course without consulting or prior permission from the lecturers concerned.

2. Plagiarism

The reputation of an academic institution depends on the ability to achieve and sustain academic excellence through the exercise of academic integrity. Academic integrity is based on honesty, trust, fairness, respect, and responsibility, which form the basis of academic work.

One aspect of the loss of academic integrity is due to plagiarism, which is the act of presenting published and unpublished ideas, writings, works or inventions of others in written or other medium, as one's own original intellectual endeavours without any clear acknowledgement of or reference to the author of the source.

MENTOR SYSTEM

Mentor system is formed to assist students to overcome problems especially regarding academic matters. Students will be guided so that they will be able to face academic challenges independently.

The mentor appointed is as below:

Dr. Yasmin Md. Radzi

yasminradzi@usm.my | 04-6533667



STUDY ABROAD SCHEME

The objective of this scheme is to create students' awareness at the international level by allowing them to register for one semester at a chosen university abroad.



ACADEMIC ADVISING GUIDELINES

1. Appointment & Initial Introduction

- Appointment of **Academic Advisors (AAs)**
- Informing Students of Their Assigned AA
- Introduction During Orientation Week
- Student being informed of AA Role & Student Rights

2. Regular Advising Sessions

At least two official sessions per semester:

- Early Semester: Discuss course planning, appropriate credit hours, and semester objectives.
- Mid/End Semester: Review academic performance and propose improvements.

3. Monitoring Academic Performance

- Review students' examination results (GPA/CGPA).
- Monitor learning outcomes and credit requirements for graduation.
- Implement intervention measures if:
 - Student fails a core/critical course.
 - CGPA falls below 2.00.
 - Insufficient course/credit registration.
 - Contact students for special advising sessions if necessary (physical or online).

4. Intervention & Follow-Up Actions

If issues are identified:

- Conduct initial counselling by the AA.
- Refer to:
 - Deputy Dean (Academic, Career & International)
 - Counselling Unit, Student Affairs & Development Division (BHEPA), USM
 - Welfare Unit, BHEPA USM
 - USM Health & Wellness Centre (Pusat Sejahtera)
- Develop and record a proposed action plan to be reviewed in the next session.

5. Academic Pathway & Career Guidance

- Advice on academic planning (elective courses, overseas programmes, industrial training).
- Career counselling sessions or referrals to the Career & Graduate Employability Sector, BHEPA.
- Support in CV preparation, internship selection, and final year research planning.

6. Documentation & Reporting

- Maintain secure records of all sessions and interactions.
- AAs to submit a brief report each semester to the School for record-keeping.

ROLES OF AN ACADEMIC ADVISOR

The key responsibilities of an Academic Advisor include:

1. Providing Academic Guidance
 - Assist students in planning their studies, including course selection each semester.
 - Advise on programme structure, credit requirements, and suitable academic paths.
 - Explain the credit hour system and related academic regulations.
 - Confirm course registration to avoid discrepancies in credit hours for graduation.
 - Review students' SMU-P and report any grade discrepancies.
2. Identifying and Assisting At-Risk Students
 - Monitor academic performance. Inform the Mentor and Deputy Dean (Academic, Career & International) if P1/P2 status students do not attend academic advising.
 - Provide support for students who fail courses, lack motivation, or face personal challenges affecting their studies.
3. Referrals and Support
 - Act as liaison to refer students to other relevant units such as counselling, financial aid, scholarships, or health services.
4. Assisting in Special Applications
 - Such as study deferment, course exemptions, academic appeals, and programme changes.
5. Fostering Professional and Long-Term Support
 - A good advisor can become a long-term source of inspiration and guidance beyond graduation.



STUDENT RIGHTS IN THE ACADEMIC ADVISING PROCESS

1

Right to Access an Academic Advisor

- Every student has the right to know who their AA is.
- Students may request sessions with their AA regularly or as needed.

2

Right to Adequate Time and Attention

- AAs must allocate sufficient time for advising.
- Students should be attended to without being rushed.

3

Right to Respectful and Professional Treatment

- Students deserve respectful and unbiased treatment.
- Their opinions should be heard and taken seriously.

4

Right to Privacy and Confidentiality

- All shared personal and academic information remains confidential.
- Information must not be disclosed without student consent, except for official/legal purposes.

5

Right to Clear and Accurate Information

- Students are entitled to clear guidance on programme structure, academic rules, course options, further study opportunities, etc.

6

Right to Make Their Own Decisions

- While advisors provide suggestions, the final academic decisions (e.g., elective course selection, programme change, study deferment) rest with the student.

7

Right to Additional Assistance or Referrals

- If the AA is unable to assist directly, the student should be referred appropriately.
- Students have the right to know the available support channels.

8

Right to Provide Feedback

- Students may give feedback about their advising experience, especially during institutional evaluations of the AA system.

DRESS CODE

Compliance with the university's dress code is expected of all students while on campus. A respectful and professional learning environment is to be maintained at all times by members of the university community.

Appropriate, modest, and presentable attire is to be worn, especially when classes are attended, administrative offices are visited, campus facilities are used, or official university events are participated in. Female students are strictly not allowed to wear sleeveless shirts, miniskirts or extremely short of shorts and revealing/skimpy clothes. Flip flops should not be worn by all students' while attending classes or interviews, visiting University departments, etc.

The following guidelines are highlighted:

- Clothing that is overly revealing or unsuitable for an academic environment should be avoided.
- Footwear is required to be worn at all times.
- A neat and clean appearance is to be maintained.
- Sports attire (shorts) can be used for areas allocated for sports only.
- Laboratory coats are meant for working in the laboratories only.

By adhering to these standards, respect for the university community is demonstrated, and a conducive environment for learning and personal growth is supported.

✓ DO'S
&

X DONT'S

OFFICIAL FUNCTION



SPORTS

LECTURES/OFFICE



LEISURE

PROHIBITED



IMPORTANT CONTACTS

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USM Dental Clinic	Registration Counter	04-6534928	
Security Department	Emergency Hotline	04-6534999	
Digital@USM (PPKT)		04-6534400	servisdesk@usm.my
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Counselling Unit	Counselling Officer	04-6533410 / 3411	salwati@usm.my
Student Accommodation	Administrative Officer	04-6533099	fariny@usm.my
Student Visa (IMCC)	Administrative Officer	04-6532777	munirahzakariah@usm.my



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School of Physics, USM



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School of Physics, Universiti Sains Malaysia

SCHOOL OF PHYSICS WEBSITE AND SOCIAL MEDIAS



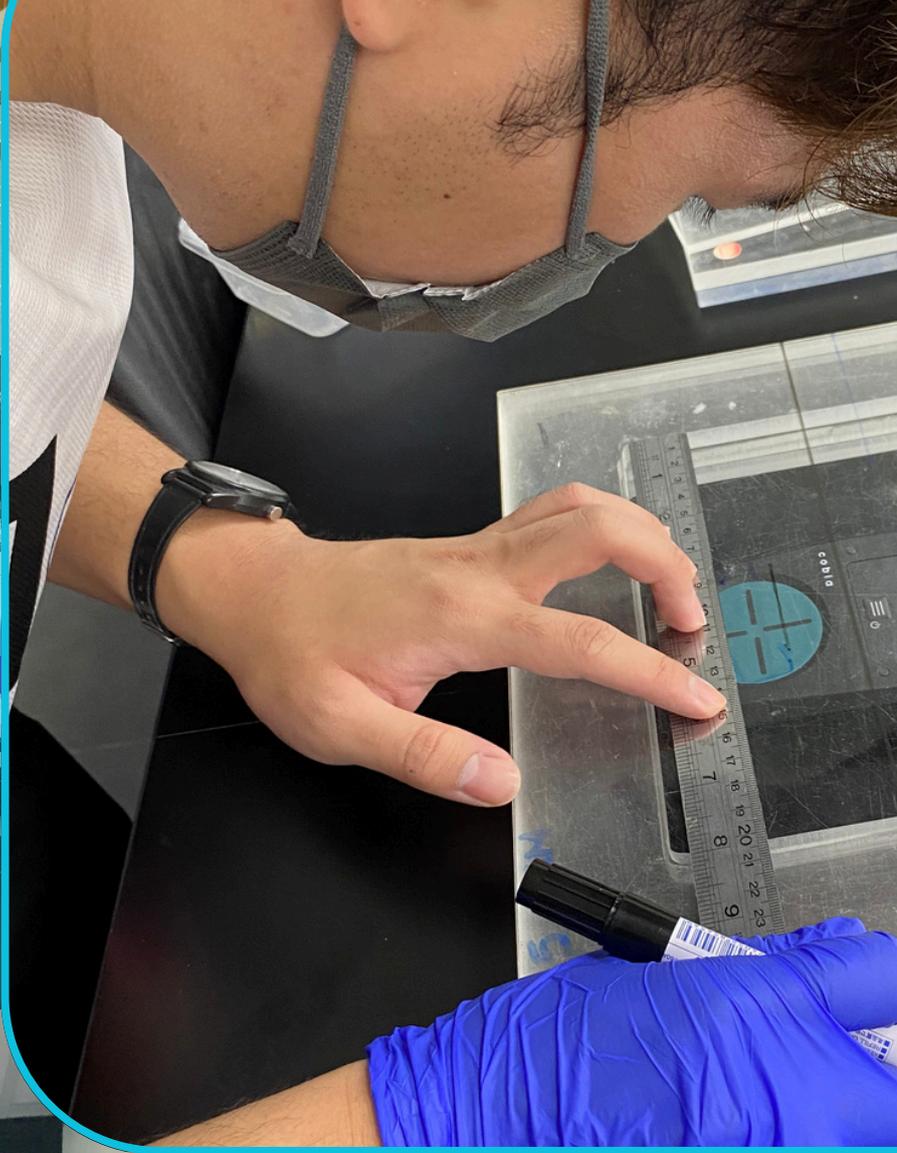
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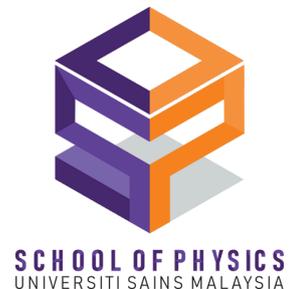
NOTES



MEDICAL PHYSICS







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