

STUDENT PROGRAMME GUIDEBOOK

FOUNDATION IN SCIENCE

Fourth Edition

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Dean's Address

Welcome to the Foundation Programme, University College of Technology Sarawak (UCTS), and I am proud that you have taken the first step towards making the right decision when you chose UCTS.

The School of Foundation Studies (SFS) is home to the Foundation in Science (FIS) and Foundation in Arts (FIA). The SFS manages one-year comprehensive foundation programmes. The SFS also provides fundamental academic knowledge and training, to enable students to enroll into UCTS's degree programmes. Nevertheless, students who pass the programme to the required level are prepared academically and socially to enroll into other recognized universities locally or overseas.

With the full range of facilities for the academic, social, cultural and sports activities as well as dedicated and experienced lecturers, we believe that your stay as a student here will generate a rewarding learning experience for your personal growth. We do hope your study journey here allows you to be inspired and challenged in order to achieve your full potential.

All students are required to follow rules and regulations in Foundation Programmes Students Academic Handbook and UCTS Students Code of Conduct & Discipline Rules and at the jurisdiction of the Dean of SFS and UCTS Senate.

Wish you a success in your study in UCTS!

**Dean
School of Foundation Studies**

1.0 PROGRAMME DESCRIPTOR FOR FOUNDATION IN SCIENCE (FIS)

1	Programme:	Foundation in Science (FIS)
2	Programme Code:	R/010/3/0125
3	Full Accreditation Registration Number:	MQA/FA3076
4	Final Award:	Certificate of Foundation in Science
5	Teaching Institution	University College of Technology Sarawak
6	Study Duration	1 year

2.0 PROGRAMME OBJECTIVES

1. To furnish the students with the fundamental knowledge and analytical skills in science enable them to undertake Bachelor's degree programmes in the field of Science and Technology.
2. To inculcate good communication, leadership and social skills as well as high ethical attitude.

3.0 PROGRAMME LEARNING OUTCOMES

Upon completion of the programmes, students will be able to:

1. To gain the mastery of the fundamental knowledge in the essential Pre-University level areas of Mathematics and Science.
2. To be armed with the capability of applying the fundamental knowledge gained in solving elementary Pre-University level problems in the areas of Mathematics and Science and to be equipped with basic skills to conduct Science laboratory experiments at Pre-University Levels.
3. To think rationally, have sense of humanity, humility and responsibility and respect of lecturers.
4. To learn that the quality and nature of coursework submitted must reflect the true level of maturity and demands of the subjects for the programme and to learn that the unethical conduct of plagiarism is prohibited in the academia.
5. To learn effective written and verbal communication skills as well as the development of teamwork spirit.
6. To be armed with scientific reasoning and critical analysis skills to solve scientific problems across 4 major fields in Science: Mathematics, Biology, Physics and Chemistry.
7. To be equipped with necessary knowledge to pursue Bachelor's degree.
8. To gain time management skills essential for ensuring tasks are completed in time.

4.0 PROGRAMME STRUCTURE

	Semester/ Year Offered	Name and Code of Course/Module	Classification (Core/Compulsory /Elective/Audit)	Credit Value
1	Sem 1, Yr 1	FIS 1114 Mathematics I	Core	4
2	Sem 1, Yr 1	FIS 1214 Physics I	Core	4
3	Sem 1, Yr 1	FIS 1314 Chemistry I	Core	4
4	Sem 1, Yr 1	UCS 1713 English I	Compulsory	3
5	Sem 1, Yr 1	UCS 1733 Introduction to Critical Thinking	Compulsory	3
6	Sem 1, Yr 1	UCS 1742 Event Management	Compulsory	2
7	Sem 1, Yr 1	UCS 1752 Bahasa Kebangsaan	Audit	-
Credit				20
1	Sem 2, Yr 1	FIS 1124 Mathematics II	Core	4
2	Sem 2, Yr 1	FIS 1224 Physics II	Core	4
3	Sem 2, Yr 1	FIS 1261 Physics Laboratory	Core	1
4	Sem 2, Yr 1	FIS 1324 Chemistry II	Core	4
5	Sem 2, Yr 1	FIS 1331 Chemistry Laboratory	Core	1
6	Sem 2, Yr 1	UCS 1723 English II	Compulsory	3
7	Sem 2, Yr 1	FIS 1243 Statics	Elective	3
8	Sem 2, Yr 1	FIS 1253 Dynamics	Elective	3
9	Sem 2, Yr 1	FIS 1513 Biology	Elective	3
Credit				20
1	Sem 3, Yr 1	FIS 1134 Mathematics III	Core	4
2	Sem 3, Yr 1	FIS 1234 Physics III	Core	4
3	Sem 3, Yr 1	FIS 1612 Computing	Core	2
Credit				10
Total Credit				50

*Subjected to elective courses availability.

** Audit course (Bahasa Kebangsaan) result will not be calculated in the students' GPA or CGPA but students are compulsory to pass this course as part of the criteria to graduate from the programme. International students are excluded to take the Audit course.

5.0 COURSE SYNOPSIS

FIS 1114 Mathematics I

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis:

This course covers algebra, function and graphs, sequences and series and matrices. It provides exposure and practice for students to gain mathematical skills that are useful in their Technology or Science Based Programme.

References:

1. Shariff, A. A., Manaf, F. A. & Mohamed, I. (2012). *College Mathematics*. Shah Alam, Selangor: IPTA Publications.
2. Ong, B. S., Yong, Z. Z. & Lee, K. Y. (2012). *Mathematics for Matriculation Semester 1* (4th ed.). Shah Alam, Selangor: Oxford Fajar.
3. Tai, P. H. (2012). *Pre U STPM Text Mathematics T First Term*. Petaling Jaya: Pearson Malaysia.

FIS 1214 Physics I

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis:

This course is designed to fulfil the mechanics requirements for the students who will pursue engineering and other analytical sciences. Vector, Newtonian Mechanics, Mechanics of Solid Materials, and Fluid Mechanics constitute the main part of the materials covered.

References:

1. Mohamed, N. S. & Sulaiman, Z. A. (2012). *College Physics*. Shah Alam, Selangor: IPTA Publications.
2. Lam, C. S. & Lim, S. K. (2012). *Pre-U Text STPM Physics First Term*. Petaling Jaya: Pearson Malaysia.
3. Poh, L. Y. & Lee, B. H. (2012). *Ace Ahead STPM Text Physics First Term*. Shah Alam, Selangor: Oxford Fajar.
4. Zaine, I. S, Mukhtar, N.M.A. , Rosli, S.A., Hasan, S. and Zabidi, Z.M. *Fundamentals of Physics 1*. Shah Alam, Selangor: Oxford Fajar.

FIS 1314 Chemistry I

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis:

This course exposes students to the knowledge and understanding of properties, bonding and reactions of chemical substances that exist in nature and industry.

References:

1. Abdullah, N., Ismail, H. B. M. & Bakar, N. H. A. (2012). *College Chemistry*. Shah Alam, Selangor: IPTA Publications.
2. Lim, Y. S. & Yip, K. H. (2012). *Pre-U Text STPM Chemistry First Term*. Petaling Jaya: Pearson Malaysia.
3. Timberlake, K. C. & Timberlake, W. (2011). *Basic Chemistry* (4th ed.). Boston: Pearson.

UCS 1713 English I

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis:

This course provides practice in analysing the textual organization of linear and non-linear texts, including subject-specific academic writing and lectures. Students are introduced to various approaches, strategies and techniques in academic reading. Students are also exposed to academic writing that will contribute towards the development of their study skills.

References:

1. Elder, J. & College, R. (2014). *New Worlds: An Introduction to College Reading* (5th ed.). Boston: McGraw-Hill.
2. Philpot, S. & Curnick, L. (2011). *Academic Skills: Reading, Writing and Study Skills* (L. Soars & J. Soars, Eds.). Oxford: Oxford University Press.
3. Lynn, S. (2011). *Q: Skills for Success, Reading and Writing*. Oxford New York: Oxford University Press.

UCS 1733 Introduction to Critical Thinking

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis

This course introduces students to the process of critical thinking, a process that is indispensable for every educated person to use when confronting complex issues and difficult problems that need to be solved. This course includes oral and written practice in the construction of good definitions, the deployment of effective arguments, the recognition and deconstruction of bad arguments, and the presentation of reasonable support and evidence. It also provides the opportunity to apply critical thinking and problem solving in non-academic fields.

References:

1. Hills, D. (2012). *Student Essentials: Critical Thinking*. Richmond: Trotman.
2. Bassham, G., Irwin, W., Nardone, H. & Wallace, J. (2012). *Critical Thinking: A Student's Introduction* (5th ed.). New York: McGraw-Hill.
3. Waller, B. N. (2012). *Critical Thinking: A Concise Guide* (3rd ed.). London New York: Routledge.

UCS 1742 Event Management

Assessment Methods:

Coursework (100%)

Synopsis

This course will provide participants with the practical skills and knowledge required to successfully plan, implement, organize, manage, monitor and evaluate special events (planning, development, management and implementation of festivals, entertainment events, corporate events, cultural events, and sport events). It provides practice in event field and develop their skills and knowledge relating to the management.

References:

1. Shone, A. & Parry, B. (2013). *Successful Event Management: A Practical Handbook* (4th ed.). Australia: Cengage Learning.
2. Wagen, L. & White, L. (2011). *Event Management for Tourism, Cultural, Business, and Sporting Events*. (4th ed.). Frenchs Forest, N.S.W: Pearson Australia.

UCS 1752 Bahasa Kebangsaan

Strategi pembelajaran dan Penilaian:

Kerja kursus (100%)

Sinopsis:

Kursus ini membolehkan pelajar mempertingkatkan kecekapan berbahasa sesuai dengan intelek pelajar untuk berkomunikasi secara lisan dan tulisan dalam konteks rasmi, kreatif dan bukan kreatif. Mata pelajaran ini disediakan untuk mempertingkatkan kecekapan berbahasa sesuai dengan intelek pelajar untuk berkomunikasi dengan lisan dan tulisan dalam konteks rasmi, kreatif dan bukan kreatif.

Rujukan:

1. Zarina Othman, Roosfa Hashim & Rusdi Abdullah (2012). *Modul Komunikasi Bahasa Melayu Antarabangsa*, KPT: Penerbit UKM Press.
2. Yong Chyn Chye, Rohaidah Mashudi, Maarof Abd Rahman (2012). *Bahasa Kebangsaan untuk pelajar luar negara: Malay language for international students*. Petaling Jaya
3. Adenan Ayob (2009) *Bahasa Kebangsaan Shah Alam*: Oxford Fajar.

FIS 1124 Mathematics II

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis:

This course covers trigonometric, differentiation, integration, statistics and matrices. It provides exposure and practise for students to gain more mathematical skills that are useful in their Technology or Science Based Programme.

References:

1. Shariff, A. A., Manaf, F. A. & Mohamed, I. (2012). *College Mathematics*. Shah Alam, Selangor: IPTA Publications.
2. Ong, B. S., Lee, K. Y., Khor, B. H., Tan, C. E. & Lye, M. S. (2011). *Mathematics for Matriculation Semester 2 (2nd ed.)*. Shah Alam, Selangor: Oxford Fajar.
3. Yang, C. & San, J. (2013). *College Matriculation Mathematics (Science)*. Singapore: SAP Publishers.

FIS 1224 Physics II

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis:

This course covers concepts of electricity and magnetism. It provides exposure and practise for students to gain more physics skills that are useful in their Technology or Science Based Programme.

References:

1. Mohamed, N. S. & Sulaiman, Z. A. (2012). *College Physics*. Shah Alam, Selangor: IPTA Publications
2. Poh, L. Y. (2012). *Ace Ahead STPM Text Physics Second Term*. Shah Alam, Selangor: Oxford Fajar.
3. Ng, O. V. (2013). *Pre-U Text STPM Physics Second Term*. Petaling Jaya: Pearson Malaysia.
4. Zaine, I. S., Mukhtar, N. M. A., Rosli, S. A., Hasan, S. & Zabidi, Z. M. (2015). *Fundamentals of Physics 2*. Shah Alam, Selangor: Oxford Fajar.

FIS 1261 Physics Laboratory

Assessment Methods:

Lab Reports (100%)

Synopsis:

This course covers mechanics, electricity and magnetism and also thermodynamics theories.

References

1. Poh, L. Y. & Lee, B. H. (2012). *Ace Ahead STPM Text Physics First Term*. Shah Alam, Selangor.
2. Poh, L. Y. (2012). *Ace Ahead STPM Text Physics Second Term*. Shah Alam, Selangor: Oxford Fajar.

FIS 1324 Chemistry II

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis:

This course exposes students to the knowledge of mechanism relating to gases, liquids and solids. Besides this, students will also obtain understanding on chemical reaction, influencing factors and calculating energy of the reactions.

References:

1. Tan, Y. T. & Kumren, A. (2013). *Chemistry for Matriculation Semester 2*. (4th ed.). Shah Alam, Selangor: Oxford Fajar.
2. Brown, T. L., LeMay, H. E., Bursten, B. E. & Murphy, C. J. (2012). *Chemistry: The Central Science* (5th ed.). Bonston: Pearson.
3. McMurry, J. E. & Fay, R. C. (2012). *Chemistry* (6th ed.). Bonston: Prentice Hall.

FIS 1331 Chemistry Laboratory

Assessment Methods:

Lab Reports (100%)

Synopsis:

This course enables students to apply the knowledge obtained in Chemistry I and Chemistry II to solve chemistry related problems. Students will be trained to carry out experiments without neglecting the laboratory safety procedures.

References:

1. Beran, J. A. (2011). *Laboratory Manual for Principles of General Chemistry* (9th ed.). Hoboken, NJ: Wiley.
2. Abdullah, N., Ismail, H. B. M. & Bakar, N. H. A. (2012). *College Chemistry*. Shah Alam, Selangor: IPTA Publications.

UCS 1723 English II

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis:

This course provides practice in effective writing for academic purposes. The course content covers the general principles of effective writing, the structure and types of academic English. Students are also given practice in the general organisation of content, editing and word processing skills.

References:

1. Savage, A. & Shafiei, M. (2012). *Effective Academic Writing 1, The Paragraph*. (2nd ed.). New York: Oxford University Press.
2. Savage, A. & Mayer, P. (2012). *Effective Academic Writing 2, The Short Essay*. (2nd ed.). New York: Oxford University Press.
3. Davis, J. & Liss, R. (2012). *Effective Academic Writing 3, The Essay*. (2nd ed.). New York: Oxford University Press.
4. Bowden, J. (2011). *Writing a Report: How to Prepare, Write & Present Effective Reports*. (9th ed.). Oxford: How to Books Ltd.

FIS 1243 Statics

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis:

This course covers the concept in forces, equilibrium of particles and rigid bodies, moment and couple, force-couple system, equivalent force/couple systems, centroids and centre of gravity, frames of references and friction theory.

References:

1. Hibbeler, R. C. & Yap, K. B. (2012). *Mechanics for Engineers: Statics* (13th ed.). Singapore: Pearson.
2. Meriam, J. L. & Kraige, L. G. (2013). *Engineering Mechanics: Statics* (7th ed.). Hoboken, NJ: Wiley.

FIS 1253 Dynamics

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis

This course deals with the concept of particle and rigid body dynamic. The first part of the course covers the kinematics of particles involving position, velocity and acceleration of particles in rectilinear, kinetics of particles related to the Newton's second law, dynamics equilibrium, linear and angular momentum, work and energy principle, impulse and impact. The second part of the course discusses the kinematics of rigid bodies involving translation, rotation about fixed axis, general plane motion, absolute and relative velocity, relative acceleration and the instantaneous centre of rotation and the kinetics of rigid bodies related to translation.

References:

1. Hibbeler, R. C. (2013). *Engineering Mechanics: Dynamics SI Study Pack* (13rd ed.). Boston: Prentice Hall.
2. Meriam, J. L. & Kraige, L. G. (2012). *Engineering Mechanics: Dynamics* (7th ed.). Hoboken, NJ: Wiley.

FIS 1513 Biology

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis:

This course highlights Biology in the aspects of molecules, photosynthesis, respiration, gaseous exchange, transport system, genetics and ecology. These build a foundation for bio-science related degree programs.

References:

1. Foo, Y. K. (2011). *Pre-U STPM. Biology Term 1*. Bangi, Selangor: Pelangi.
2. Tan, Y. Y. (2013). *Real Exam Practice Biology for Matriculation SB026*. Shah Alam, Selangor: SAP Publishers.
3. Rashid, A. K., Haron K., Jalil M. & Abd Aziz, N. A. (2012). *College Biology*. Shah Alam, Selangor: IPTA Publications.

FIS 1134 Mathematics III

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis:

This course covers Taylor series and Maclaurin series, complex numbers, vectors, further integration, differential equations and numerical methods. It provides exposure and practice for students to gain more mathematical skills that are useful in their Technology or Science Based Programme.

References:

1. Shariff, A. A., Manaf, F. A. & Mohamed, I. (2012). *College Mathematics*. Shah Alam, Selangor: IPTA Publications.
2. Yang, C. & San, J. (2013). *College Matriculation Mathematics (Science)*. Singapore: SAP Publishers.
3. Goldstein, L. J., Lay, D. I. & Schneider, D. C. & Asmar, N. I. (2014). *Calculus and its Application*, (13rd ed.). Boston: Pearson Education.

FIS 1234 Physics III

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis:

This course covers concepts of Waves, Modern Physics & Thermal Physics.

References:

1. Nor Sabirin & Zainal Abidin Sulaiman Co. 2012. *College Physics*, IPTA Publications
2. Resnick et. Al. 2013. *Fundamentals of Physics*, 10th ed., John Wiley & Sons.
3. Serway & Vuille, 2016. *College Physics*, 11th ed., Brooks Cole.

FIS 1612 Computing

Assessment Methods:

Coursework (50%) Final Examination (50%)

Synopsis

This course helps students to acquire the basic skills in pertaining to information, communication and technology tools and systems as well as their applications.

References:

1. O' Leary, T. J. & O' Leary, L. I. (2014). *Computing Essentials 2015: Making IT Work for You*. McGraw-Hill Higher Education.
2. Vermaat, M. E. (2014). *Enhanced Discovering Computers: Essentials*. Australia: Course Technology.