SORBONNE
UNIVERSITY
ABU DHABI

Foundation year in
SCIENCES

COURSE CATALOGUE FOR THE 2025-2026 ACADEMIC YEAR

The Foundation Year in Sciences at Sorbonne University Abu Dhabi bridges high school education and world-class university academics. This English-taught programme equips students with the essential skills to succeed at the university level and excel in any undergraduate science programme.

It ensures uniformity among students from diverse backgrounds through an intensive curriculum in Mathematics, Physics, and Computer Science, integrating laboratory exploration and Data Science. It also builds critical thinking skills and introduces students to the research-focused approach of their chosen programmes.

Sciences - Maths

Programme Code: FYS

Level: Foundation year

Credits and Duration: 60 coefficients - 533 hours.

Delivery Language: English

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Foundation Year - Maths

This programme provides a comprehensive introduction to fundamental mathematical concepts and methods, offering a solid academic base for students entering science, engineering, technology, and mathematics degrees. It includes an overview of precalculus and calculus, introductory linear algebra, discrete mathematics, algorithms, and active science. The curriculum develops a deep understanding of mathematical reasoning, problem-solving, and analytical thinking, while helping students acquire essential quantitative skills used across scientific disciplines. Students are also introduced to the practical applications of mathematics in modern technologies, scientific inquiry, and computational problem-solving.

Academic and Professional Skills:

The Foundation Year in Mathematics supports students in developing a wide range of academic competencies that are highly valued in STEM fields. By engaging with core mathematical subjects, students:

- Gain a strong grounding in precalculus and calculus, enabling them to understand limits, derivatives, integrals, and mathematical modelling.
- Build introductory knowledge of linear algebra, including vectors, matrices, and systems of equations, and learn how these concepts apply to engineering, physics, data science, and computing.
- Explore discrete mathematics to understand structures such as sets, logic, relations, graphs, and combinatorics—essential foundations for computer science and algorithm design.
- Develop algorithmic thinking through an introduction to algorithms, learning how problems can be represented, analysed, and solved systematically.
- Strengthen their understanding of scientific inquiry through active science, building connections between mathematical concepts and real-world scientific phenomena.
- Acquire technical and professional skills through the use of digital tools, mathematical software, and computational resources to support problem-solving and data analysis.
- Improve academic writing, communication, and English-language proficiency for scientific contexts.

The broad scope of this foundation programme ensures that students build a comprehensive understanding of the theories and methods that support advanced mathematical learning. Additionally, the programme equips students with the ability to apply mathematical principles to scientific, technological, economic, and engineering challenges.

Programme Structure:

	UE	Course code	Course name	Coefficients	Date
1st Semester	1	MATH-001	Precalculus 1	15	Sep – Dec 2025
	2	MATH-009	Introduction to Linear Algebra	4	Sep – Dec 2025
	3	PHYS-014	Measurement and Uncertainty	4	Sep – Dec 2025
	4	MATH-011	Introduction to Algorithms	4	Sep – Dec 2025
	5	PHYS-012	Methodology	No weight but must have 12/20	Sep – Dec 2025
	6	SCEN-101	Languages	3	Sep – Dec 2025

	UE	Course code	Course name	Coefficients	Date
2nd Semester	1	MATH-002	Elements of Calculus	12	Jan – May 2026
	2	MATH-006	Discrete Mathematics	8	Jan – May 2026
	4	MATH-008	Active Science	4	Jan – May 2026
	5	PHYS-015	Introduction to Optics	3	Jan – May 2026
	6	SCEN-101	Languages	3	Jan – May 2026

Foundation year - Maths - Semester 1

Course code and title	**MATH-001 – *Precalculus 1***
Instructor	Dr Bilal Maaz – Dr Samar Ghantous
Date	Sep – Dec 2025
Course format	Weekly class
Coefficients	15
Contact hours	100
Course description	The course starts with the study of (real) polynomials and operations thereof. Methods of solutions of equalities and inequalities among polynomials are then presented and this part of the course ends with the presentation of the equations of lines, parabolas, hyperbolas, ellipses and the study of conic sections. In the second part of the course, trigonometric functions and their inverses are analysed in depth, together with remarkable trigonometric identities. This part ends with the presentation of methods of solution of trigonometric equalities and inequalities. The course ends with an introduction to sequences, finite series and the principle of mathematical induction.
Evaluation	50% CC, 50% CF

Course code and title	MATH-009 – *Introduction to Linear Algebra*
Instructor	Dr Safaa El Sayed – Dr Samar Ghantous
Date	Sep – Dec 2025
Course format	Weekly class
Coefficients	4
Contact hours	40
Course description	The course provides a basic to intermediate-level introduction to Linear Algebra. After familiarising with linear systems, students are presented with their interplay with matrix algebra. An account on the Theory of Linear Maps follows therefrom and the course ends with an introduction to eigenvalues and eigenvectors.
Evaluation	50% CC, 50% CF

Course code and title	PHYS-014 – *Measurement and Uncertainty*
Instructor	Dr Valerie Le Guyon
Date	Sep – Dec 2025
Course format	Weekly class
Coefficients	4
Contact hours	34
Course description	This course will introduce lab activities to the students, teaching them how to collect data, and - relying on a probabilistic approach - how to evaluate the sources of uncertainty and report a scientific result. The students will learn how to use the lab equipment, how to perform an experiment and investigate a simple topic in classical mechanics. They will analyse their data, calculate the uncertainty and compare different experimental conditions and sets of data. They will then interpret their results. They will write 4 Lab reports, with an emphasis on the data collection, the application of the relevant method to calculate the most probable value and its uncertainty, and the interpretation of the experiment.
Evaluation	4 Lab Reports 80%, Final Presentation 20%

Course code and title	MATH-011 – *Introduction to Algorithms*
Instructor	Dr Giulia Demasi – Dr Damien Jamet
Date	Sep – Dec 2025
Course format	Weekly class
Coefficients	4
Contact hours	30
Course description	This course is a foundational course designed to equip students with a comprehensive understanding of algorithmic principles and their applications. It introduces the role of algorithms in computing and covers the following topics: Introduction to logic, logic circuits, Boolean operations, sorting and searching algorithms, and Elementary Data Structures.
Evaluation	50% CC, 50% CF

Course code and title	PHYS-012 – *Methodology*
Instructor	Dr Valerie Le Guyon
Date	Sep – Dec 2025
Course format	Weekly class
Coefficients	No weight but must have 12/20
Contact hours	20
Course description	This course equips the students with the tools and skills required to succeed at university level: it will describe the study cycle and teach how to study efficiently. It will emphasise on effective note taking, introducing the students to different techniques, and good practice to prepare for, attend and review a class. It will then focus on the best ways to study material in mathematics and physics, and to prepare for tests and examinations. Finally, it will teach how to write a report – for a lab or a project, and how to prepare a presentation, from the selection and citation of resources, to giving the presentation.
Evaluation	100% CC

Course code and title	SCEN-101 – *Languages*
Instructor	Karima Bendjaballah – Sara Zaki – Moones Aref – Rana Shabbaneh – Karine Chackal – Romain Degrote – Charbel Elias
Date	Sep – Dec 2025
Course format	Weekly class
Coefficients	3 per semester
Contact hours	39 (Total hours for semester 1 and 2)
Course description	Students will follow languages classes: French by default. French-speaking students will choose among languages offered by the SUAD Foreign languages department.
Evaluation	100% CC

Foundation year - Maths - Semester 2

Course code and title	**MATH-002 – *Elements of Calculus***
Instructor	Dr Lama Tarsissi
Date	Jan – May 2026
Course format	Weekly class
Coefficients	12
Contact hours	100
Course description	The course starts with the systematic presentation of the theory of functions and the conditions under which local and global inversibility hold. Remarkable functions are then studied; more precisely, integer and fractional powers, exponentials and logarithms as well as absolute values. This leads to a thorough introduction to Calculus, where limits, derivatives and chain rule, primitives and rules of integration (including by substitution and by parts) are studied in depth. With these tools at hand, students are taught how to perform the study of a given function, i.e. to determine the domain, the sign, the variations, inflections, bounds, vertical asymptotes and slant asymptotes. The course ends with a rigorous introduction to complex numbers, including algebraic and trigonometric forms, representation in the Gauss plane and the study of the roots of unity.
Evaluation	50% CC, 50% CF

Course code and title	MATH-006 – *Discrete Mathematics*
Instructor	Dr Janos Barat – Dr Damien Jamet
Date	Jan – May 2026
Course format	Weekly class
Coefficients	8
Contact hours	80
Course description	This course covers some of the basic notions of Discrete Mathematics. The starting point is an account of elementary set theory, followed by an account on relations and functions. Follows a thorough treatment of basic enumerative combinatorics presented through the study of the twelvefold way, as introduced by G. Rota. The course ends with an overview of graph theory.
Evaluation	50% CC, 50% CF

Course code and title	MATH-008 – *Active Science*
Instructor	Dr Wafa Ahmad
Date	Jan – May 2026
Course format	Weekly class
Coefficients	4
Contact hours	60
Course description	The course introduces students to the basics of Descriptive Statistics and Data Visualisation, as well as to some of the most used tools and packages of Data / Statistical Analysis, such as Python, R, etc. The students will then conduct a project in which they will apply the acquired notions and skills in the analysis of a realistic dataset and present the obtained results in the framework of a time-constrained presentation before a panel of instructors from the Department.
Evaluation	100% CC

Course code and title	**PHYS-015 – *Introduction to Geometric Optics***
Instructor	Dr Stavros Christopoulos
Date	Jan – May 2026
Course format	Weekly class
Coefficients	3
Contact hours	30
Course description	This course covers the main concepts of geometric optics, starting with the laws of reflection and refraction, the dispersion and the total internal reflection. It then deals with the image formation through plane and spherical mirrors, graphically (using Ray diagrams) and mathematically (applying the Mirror equation and calculating the transverse magnification), introducing the principal and secondary focal points, as well as the real and virtual object and image. It then studies the effect of a spherical diopter on a ray of light and introduces the concept of thin lens, along with the Lensmaker's equation. Then the students learn how to place the focal points object and image (principal and secondary ones), and to determine the final image and the transverse magnification, drawing a ray diagram or by calculation, by applying the Thin Lens Equation. The Lab sessions explore the different concepts covered, allow the students to relate theory and observation, and to perform measurements.
Evaluation	50% CC, 50% CF

Course code and title	**SCEN-101 – *Languages***
Instructor	Karima Bendjaballah – Sara Zaki – Moones Aref – Rana Shabbaneh – Karine Chackal – Romain Degrote – Charbel Elias
Date	Jan – May 2026
Course format	Weekly class
Coefficients	3 per semester
Contact hours	39 (Total hours for semester 1 and 2)
Course description	Students will follow languages classes: French by default. French-speaking students will choose among languages offered by the SUAD Foreign languages department.
Evaluation	100% CC

Permanent Academic and Administrative Staff

Head of Department: Dr Valerie Le Guyon
Head of Programme: Dr Lama Tarsissi
Academic Coordinator: Patricia Chahwane
Permanent Faculty:

- Dr Ahmed Slimani
- Dr Stavros Christopoulos
- Dr Valerie Le Guyon
- Dr Lama Tarsissi
- Dr Safaa El Sayed
- Dr Giulia Demasi

Position	Contact Details
Head of Department	Dr Valerie Le Guyon Ext. 9283 valerie.leguyon@sorbonne.ae
Head of Programme	Dr Lama Tarsissi Ext. 9148 lama.tarsissi@sorbonne.ae
Academic Coordinator	Mrs Patricia Chahwane Ext. 9417 Patricia.chahwane@sorbonne.ae
Student Affairs Acting Head of Department	Mrs Sylva Hardan Ext. 9749 sylva.hardan@sorbonne.ae
Sports Head of Department	Mrs Ellenita Merle Ext. 9364 Ellenita.Merle@sorbonne.ae
Sports Office	sports@sorbonne.ae +971 (0) 2 656 9356
Other Services - Female Student Residence	Ext. 9395
Other Services - Male Student Residence	Ext. 9394
Medical Clinic	Ext. 9621

Sciences - Physics

Programme Code: FYS

Level: Foundation year

Credits and Duration: 60 coefficients - 513 hours.

Delivery Language: English

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Foundation Year - Physics

This programme provides a comprehensive introduction to the fundamental concepts and methods that support university-level studies in physics and related scientific fields.

It offers a structured overview of precalculus and calculus, introductory linear algebra, introductory algorithms, geometric optics, electrokinetics, mathematics for physics, and active sciences. The curriculum develops a deep understanding of analytical reasoning, mathematical modelling, and physical principles, equipping students with the essential foundations required for advanced scientific study. Students are also introduced to the processes of scientific inquiry, experimentation, and the application of mathematical tools to describe and interpret physical phenomena.

Academic and Professional Skills:

The Foundation Year in Sciences – Physics enables students to develop a broad set of academic and practical skills that are highly valued across all STEM disciplines. Through exposure to key scientific and mathematical subjects, students will:

- Build strong mathematical foundations through precalculus and calculus, learning essential concepts such as limits, derivatives, integrals, and their applications to motion, forces, and physical models.
- Acquire introductory knowledge of linear algebra, including vectors, matrices, and linear systems, and understand their role in physics, engineering, and computational science.
- Develop algorithmic thinking by exploring the basics of algorithms and computational reasoning, preparing them for future work in programming, simulation, and data analysis.
- Understand the fundamentals of geometric optics, including the behaviour of light, reflection, refraction, optical instruments, and related physical laws.
- Study electrokinetics to gain insight into electric fields, electric currents, circuits, potential, resistance, and the principles governing electrical systems.
- Explore mathematics for physics, strengthening their ability to use mathematical structures, equations, and methods to solve physical problems.
- Engage with Robotics tools to develop scientific intuition, laboratory skills, experimental methodology, and the ability to interpret and present scientific data.
- Gain experience using scientific and technological tools, including digital resources and mathematical software, to support modelling, problem-solving, and analysis.
- Improve academic communication, scientific writing, and English-language skills required for success in university science programmes.

The extensive scope of this foundation programme ensures students develop a comprehensive understanding of the theoretical and practical tools needed to succeed in physics and other scientific fields. Students learn to connect mathematical reasoning with physical interpretation, analyse scientific problems using appropriate quantitative methods, and apply computational and digital tools effectively.

Programme Structure:

	UE	Course code	Course name	Coefficients	Date
1st Semester	1	MATH-001	Precalculus 1	15	Sep – Dec 2025
	2	MATH-009	Introduction to Linear Algebra	4	Sep – Dec 2025
	3	PHYS-014	Measurement and Uncertainty	4	Sep – Dec 2025
	4	MATH-011	Introduction to Algorithms	4	Sep – Dec 2025
	5	PHYS-012	Methodology	No weight but must have 12/20	Sep – Dec 2025
	6	SCEN-101	Languages	3	Sep – Dec 2025

	UE	Course code	Course name	Coefficients	Date
2nd Semester	1	MATH-002	Elements of Calculus	12	Jan – May 2026
	3	MATH-007	Mathematics for Physics	4	Jan – May 2026
	4	MATH-006	Active Science	4	Jan – May 2026
	5	PHYS-008	Electrokinetics	4	Jan – May 2026
	6	PHYS-015	Introduction to Geometric Optics	3	Jan – May 2026
	7	SCEN-101	Languages	3	Jan – May 2026

Foundation year - Physics - Semester 1

Course code and title	**MATH-001 – *Precalculus 1***
Instructor	Dr Bilal Maaz – Dr Samar Ghantous
Date	Sep – Dec 2025
Course format	Weekly class
Coefficients	15
Contact hours	100
Course description	The course starts with the study of (real) polynomials and operations thereof. Methods of solutions of equalities and inequalities among polynomials are then presented and this part of the course ends with the presentation of the equations of lines, parabolas, hyperbolas, ellipses and the study of conic sections. In the second part of the course, trigonometric functions and their inverses are analysed in depth, together with remarkable trigonometric identities. This part ends with the presentation of methods of solution of trigonometric equalities and inequalities. The course ends with an introduction to sequences, finite series and the principle of mathematical induction.
Evaluation	50% CC, 50% CF

Course code and title	MATH-009 – *Introduction to Linear Algebra*
Instructor	Dr Safaa El Sayed – Dr Samar Ghantous
Date	Sep – Dec 2025
Course format	Weekly class
Coefficients	4
Contact hours	40
Course description	The course provides a basic to intermediate-level introduction to Linear Algebra. After familiarising with linear systems, students are presented with their interplay with matrix algebra. An account on the Theory of Linear Maps follows therefrom and the course ends with an introduction to eigenvalues and eigenvectors.
Evaluation	50% CC, 50% CF

Course code and title	PHYS-014 – *Measurement and Uncertainty*
Instructor	Dr Valerie Le Guyon
Date	Sep – Dec 2025
Course format	Weekly class
Coefficients	4
Contact hours	34
Course description	This course will introduce lab activities to the students, teaching them how to collect data, and - relying on a probabilistic approach - how to evaluate the sources of uncertainty and report a scientific result. The students will learn how to use the lab equipment, how to perform an experiment and investigate a simple topic in classical mechanics. They will analyse their data, calculate the uncertainty and compare different experimental conditions and sets of data. They will then interpret their results. They will write 4 Lab reports, with an emphasis on the data collection, the application of the relevant method to calculate the most probable value and its uncertainty, and the interpretation of the experiment.
Evaluation	4 Lab Reports 80%, Final Presentation 20%

Course code and title	MATH-011 – *Introduction to Algorithms*
Instructor	Dr Giulia Demasi – Dr Damien Jamet
Date	Sep – Dec 2025
Course format	Weekly class
Coefficients	4
Contact hours	30
Course description	This course is a foundational course designed to equip students with a comprehensive understanding of algorithmic principles and their applications. It introduces the role of algorithms in computing and covers the following topics: Introduction to logic, logic circuits, Boolean operations, sorting and searching algorithms, and Elementary Data Structures.
Evaluation	50% CC, 50% CF

Course code and title	PHYS-012 – *Methodology*
Instructor	Dr Valerie Le Guyon
Date	Sep – Dec 2025
Course format	Weekly class
Coefficients	No weight but must have 12/20
Contact hours	20
Course description	This course equips the students with the tools and skills required to succeed at university level: it will describe the study cycle and teach how to study efficiently. It will emphasise on effective note taking, introducing the students to different techniques, and good practice to prepare for, attend and review a class. It will then focus on the best ways to study material in mathematics and physics, and to prepare for tests and examinations. Finally, it will teach how to write a report – for a lab or a project, and how to prepare a presentation, from the selection and citation of resources, to giving the presentation.
Evaluation	100% CC

Course code and title	SCEN-101 – *Languages*
Instructor	Karima Bendjaballah – Sara Zaki – Moones Aref – Rana Shabbaneh – Karine Chackal – Romain Degrote – Charbel Elias
Date	Sep – Dec 2025
Course format	Weekly class
Coefficients	3 per semester
Contact hours	39 (Total hours for semester 1 and 2)
Course description	Students will follow languages classes: French by default. French-speaking students will choose among languages offered by the SUAD Foreign languages department.
Evaluation	100% CC

Foundation year - Physics - Semester 2

Course code and title	MATH-002 – *Elements of Calculus*
Instructor	Dr Lama Tarsissi
Date	Jan – May 2026
Course format	Weekly classes
Coefficients	12
Contact hours	100
Course description	The course starts with the systematic presentation of the theory of functions and the conditions under which local and global inversibility hold. Remarkable functions are then studied; more precisely, integer and fractional powers, exponentials and logarithms as well as absolute values. This leads to a thorough introduction to Calculus, where limits, derivatives and chain rule, primitives and rules of integration (including by substitution and by parts) are studied in depth. With these tools at hand, students are taught how to perform the study of a given function, i.e. to determine the domain, the sign, the variations, inflections, bounds, vertical asymptotes and slant asymptotes. The course ends with a rigorous introduction to complex numbers, including algebraic and trigonometric forms, representation in the Gauss plane and the study of the roots of unity.
Evaluation	50% CC, 50% CF

Course code and title	**PHYS-007 – *Mathematics for Physics***
Instructor	Dr Samar Ghantous
Date	Jan – May 2026
Course format	Weekly classes
Coefficients	3
Contact hours	30
Course description	This course will be focused on how to use mathematical methods and Matlab for modelling physical phenomena. It will apply, among the others, the following mathematical concepts, very commonly used in Physics: vectors, scalar product, vector product, matrix rotation, derivatives and integrals, vector fields, rotating frame of reference. All these concepts will be explained theoretically, applied in exercises, and implemented in Matlab. The applications will start from basic kinematics to dynamics.
Evaluation	50% CC, 50% CF

Course code and title	**PHYS-006 – *Active Science***
Instructor	Dr Ahmed Slimani
Date	Jan – May 2026
Course format	Weekly classes
Coefficients	4
Contact hours	60
Course description	The course introduces students to the basics of Descriptive Statistics and Data Visualisation, as well as to some of the most used tools and packages of Data / Statistical Analysis, such as Python, R, etc. The students will then conduct a project in which they will apply the acquired notions and skills in the analysis of a realistic dataset and present the obtained results in the framework of a time-constrained presentation before a panel of instructors from the Department.
Evaluation	100% CC

Course code and title	**PHYS-008 – *Electrokinetics***
Instructor	Dr Joumana El Rifai
Date	Jan – May 2026
Course format	Weekly classes
Coefficients	4
Contact hours	30
Course description	This course introduces the students to a foundation of DC circuit analysis methods such as Kirchhoff's current and voltage laws, Ohm's law and network theorems. The capacitor will be briefly examined along with its transient behaviour. A number of experiments will introduce the students to basic circuit assembly and measurement techniques.
Evaluation	100% CC

Course code and title	**PHYS-015 – *Introduction to Geometric Optics***
Instructor	Dr Stavros Christopoulos
Date	Jan – May 2026
Course format	Weekly classes
Coefficients	3
Contact hours	30
Course description	This course covers the main concepts of geometric optics, starting with the laws of reflection and refraction, the dispersion and the total internal reflection. It then deals with the image formation through plane and spherical mirrors, graphically (using Ray diagrams) and mathematically (applying the Mirror equation and calculating the transverse magnification), introducing the principal and secondary focal points, as well as the real and virtual object and image. It then studies the effect of a spherical diopter on a ray of light and introduces the concept of thin lens, along with the Lensmaker's equation. Then the students learn how to place the focal points object and image (principal and secondary ones), and to determine the final image and the transverse magnification, drawing a ray diagram or by calculation, by applying the Thin Lens Equation. The Lab sessions explore the different concepts covered, allow the students to relate theory and observation, and to perform measurements.
Evaluation	50% CC, 50% CF

Course code and title	SCEN-101 – *Languages*
Instructor	Karima Bendjaballah – Sara Zaki – Moones Aref – Rana Shabbaneh – Karine Chackal – Romain Degrote – Charbel Elias
Date	Jan – May 2026
Course format	Weekly class
Coefficients	3 per semester
Contact hours	39 (Total hours for semester 1 and 2)
Course description	Students will follow languages classes: French by default. French-speaking students will choose among languages offered by the SUAD Foreign languages department.
Evaluation	100% CC

Permanent Academic and Administrative Staff

Head of Department: Dr Valerie Le Guyon
Head of Programme: Dr Lama Tarsissi
Academic Coordinator: Patricia Chahwane
Permanent Faculty:

- Dr Ahmed Slimani
- Dr Lama Tarsissi
- Dr Joumana El Rifai
- Dr Valerie Le Guyon
- Dr Giulia Demasi
- Dr Safaa El Sayed

Position	Contact Details
Head of Department	Dr Valerie Le Guyon Ext. 9283 valerie.leguyon@sorbonne.ae
Head of Programme	Dr Lama Tarsissi Ext. 9148 lama.tarsissi@sorbonne.ae
Academic Coordinator	Mrs Patricia Chahwane Ext. 9417 Patricia.chahwane@sorbonne.ae
Student Affairs Acting Head of Department	Mrs Sylva Hardan Ext. 9749 sylva.hardan@sorbonne.ae
Sports Head of Department	Mrs Ellenita Merle Ext. 9364 Ellenita.Merle@sorbonne.ae
Sports Office	sports@sorbonne.ae +971 (0) 2 656 9356
Other Services - Female Student Residence	Ext. 9395
Other Services - Male Student Residence	Ext. 9394
Medical Clinic	Ext. 9621

The curriculum follows the European ECTS system