



澳門大學  
UNIVERSIDADE DE MACAU  
UNIVERSITY OF MACAU

## **Newly offered programme in 2019/2020 academic year**

### **Bachelor of Science in Applied Physics and Chemistry**

(The programme is being registered and will come into operation upon publication in Macao SAR Gazette)

#### **Introduction**

The Bachelor of Science in Applied Physics and Chemistry offers students a comprehensive grounding in physics and chemistry with focus on their interdisciplinary applications. The scope of study for Physics and Chemistry overlaps with other scientific and engineering disciplines (e.g., materials science, environmental science, biomedical science and engineering, electronics, mechanical and manufacturing engineering) as well as tackling of global challenges such as energy production, health and well-being, food security and the use of natural resources. Unlike the traditional single-focus discipline, graduates with a degree in Applied Physics and Chemistry possess a unique qualification. They not only have a broad foundation of physics and chemistry principles but also are trained in applying these principles to various fields with ability to solve complex real-life problems, which can help widen their career and research prospects.

#### **Features**

- The programme covers a wide range of specialized areas in Physics, Chemistry, Materials and Energy, Environment, and etc.
- It provides professional training in new technologies, physical phenomena and measurement methods
- Programme especially designed for those who would like to be specialized in scientific, engineering, research and education areas.

#### **Graduate Career Prospects**

- Scientific and engineering related careers including materials, chemical, petrochemical, food, beverage, energy, environment, and electronics, etc.
- Government
- Public organizations
- Laboratories & testing centers
- Hospitals
- Microelectronics/Optoelectronics companies
- Petroleum and chemical engineering industry
- Food industry
- Construction firms
- Universities
- Teacher
- Consultant



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### Admission Channel

- Applicants may apply for admission by one of the following channels, whichever is applicable to them:
  - ✓ Admission Examination (Application period: 3 – 18 January 2019)
  - ✓ Direct Admission (Application period: 3 December 2018 – 18 April 2019)
- Please refer to the Registry's webpage at <https://reg.um.edu.mo/admission/> for details.

### Academic and Teaching Arrangement

1. Degree Award: Bachelor of Science
2. Area of concentration: Applied Physics and Chemistry
3. Programme Duration: 4 years
4. Minimum credit requirement for graduation: 132 credits and pass all required courses
5. Medium of instruction: English
6. Programme curriculum for Bachelor of Science in Applied Physics and Chemistry listed as below (Below curriculum may subject to change and final version will be announced on faculty website):

Course	Type	Credits
<i>1<sup>st</sup> Academic Year</i>		
College Physics	Compulsory Major Course	3
Advance Mathematics I	"	3
Electromagnetism and Physical Optics	"	3
Introduction to College Chemistry	"	3
Programming Science	"	3
Languages and Skills <sup>1, 2</sup>	"	9
Community & Peer Education <sup>1</sup>	"	2
General Education <sup>1</sup>	"	9
<b>Total Credits</b>		<b>35</b>
<i>2<sup>nd</sup> Academic Year</i>		
Advanced Mathematics II	Compulsory Major Course	3
Analytical and Environmental Chemistry	"	3
Modern Physics	"	3
Inorganic Chemistry	"	3
Quantum Physics	"	3
Languages and Skills <sup>1, 2</sup>	"	6



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Course	Type	Credits
Community & Peer Education <sup>1</sup>	"	1
General Education <sup>1</sup>	"	6
2 Free Electives <sup>3</sup>	Free Elective	6
<b>Total Credits</b>		<b>34</b>
<b>3<sup>rd</sup> Academic Year</b>		
Thermodynamic and Statistical Physics	Compulsory Major Course	3
Solid State Physics	"	3
Materials Physics and Chemistry	"	3
Semiconductor Physics	"	3
Physical Chemistry	"	3
Materials Characterization	"	3
Optoelectronics	"	3
General Education <sup>1</sup>	"	6
3 Free Electives <sup>3</sup>	Free Elective	9
<b>Total Credits</b>		<b>36</b>
<b>4<sup>th</sup> Academic Year</b>		
Research Project	Compulsory Major Course	6
General Education <sup>1</sup>	"	3
4 Required Electives from the "Required Elective Course List" of Bachelor of Science in Applied Physics and Chemistry	Required Elective	12
2 Free Electives <sup>3</sup>	Free Elective	6
<b>Total Credits</b>		<b>27</b>
<b>Grand Total Credits</b>		<b>132</b>

1. General Education course list will be posted on University of Macau's website.
2. Students who test out of some of the "Languages and Skills course(s)" are required to make up the credits by taking additional Free Elective(s). Please refer to University of Macau's website for the details of exemption application from taking "Language and Skills" courses.
3. Students can select any courses provided by home faculty or other faculties as free elective courses to fulfil credit requirement of Free Elective Course.



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**List of Required Elective Courses for  
Bachelor of Science in Applied Physics and Chemistry**

<b>Course</b>	<b>Credits</b>
Probability and Statistics	3
Electrochemistry	3
Magnetic Properties of Materials	3
Mathematical Methods in Physics	3
Electrodynamics	3
Low-dimensional Physics	3
Micro-/Nano-systems	3
Nanochemistry	3
Organic and Polymer Chemistry	3
Physics of Semiconductor Processing	3
Semiconductor Materials and Devices	3
Supramolecular Chemistry	3
Theory and Modeling of Materials Properties	3
Thin Film Physics	3
Topics in Emerging Materials	3