



澳門大學  
UNIVERSIDADE DE MACAU  
UNIVERSITY OF MACAU

## Newly offered programme in 2019/2020 academic year

### Bachelor of Science in Bioinformatics

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

#### Introduction

Bioinformatics is one of the fast-developing fields in the 21<sup>st</sup> century in view of the need for in-depth study areas of health sciences. It applies research and analytical tools that integrate the knowledge of computer science, information technology and statistics to understand biological data and solve problems. The objective of the programme is to nurture professionals in bioinformatics, who are the important building block to develop Macao as a smart city. The graduates of the programme are fully capable to pursue a career in the medical sector, as well as biomedical, pharmaceutical and biotechnological industries.

#### Features

- The programme covers a wide range of specialized areas in bioinformatics, biomedical science, computer science and information science.
- Through the understanding of computer science, information science and statistics, provides professional training in understanding bioinformatics.
- Programme especially designed for those who would like to be specialized in:
  - ✓ a career aspect that is related to medical sector, biomedical, pharmaceutical and biotechnological industries.
  - ✓ biomedical and molecular medicine, biotechnology, academia.

#### Graduate Prospects

- Research positions: Universities, Scientific Institutes, Hospitals, Companies
- Administrative positions: Scientific Officer, Regulator, Inspector, Administrator
- Entrepreneur positions: Business starter and risk taker

#### 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.



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### Academic and Teaching Arrangement

1. Degree Award: Bachelor of Science
2. Area of concentration: Bioinformatics
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 Bioinformatics listed as below (Below curriculum may subject to change and final version will be announced on faculty website):

Course	Type	Credits
<b><i>1<sup>st</sup> Academic Year</i></b>		
Introduction to Biological Sciences	Compulsory Major Course	3
General and Clinical Biochemistry	"	3
Programming Science	"	3
Languages & Skills Courses <sup>1,2</sup>	"	9
Community and Peer Education Courses <sup>1</sup>	"	2
General Education Course <sup>1</sup>	"	12
<b>Total Credits</b>		<b>32</b>
<b><i>2<sup>nd</sup> Academic Year</i></b>		
Cell and Molecular Biology	Compulsory Major Course	3
Discrete Structures	"	3
Linear Algebra I	"	3
Object Oriented Programming and Data Structures	"	3
Genetics and Epigenetics	"	3
Algorithm Design and Analysis	"	3
Languages & Skills Course <sup>1,2</sup>	"	6
Community and Peer Education Course <sup>1</sup>	"	1
General Education Courses <sup>1</sup>	"	3
1 required elective from the “Required Elective Course List” of Bachelor of Science in Bioinformatics	Required Elective	3
2 Free Electives <sup>3</sup>	Free Elective	6



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Course	Type	Credits
<b>Total Credits</b>		<b>37</b>
<b><i>3<sup>rd</sup> Academic Year</i></b>		
Introduction to Database Systems	Compulsory Major Course	3
Biostatistics and Experimental Design	"	3
Genomics and Bioinformatics	"	3
Advanced Bioinformatics	"	3
General Education Courses <sup>1</sup>	"	6
3 required electives from the “Required Elective Course List” of Bachelor of Science in Bioinformatics	Required Elective	9
2 Free Electives <sup>3</sup>	Free Elective	6
<b>Total Credits</b>		<b>33</b>
<b><i>4<sup>th</sup> Academic Year</i></b>		
Final Year Project I	Compulsory Major Course	3
Final Year Project II	"	3
General Education Courses <sup>1</sup>	"	3
3 required electives from the “Required Elective Course List” of Bachelor of Science in Bioinformatics	Required Elective	9
4 Free Electives <sup>3</sup>	Free Elective	12
<b>Total Credits</b>		<b>30</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 Bioinformatics**

<b>Course</b>	<b>Credits</b>
Genetics, Genomics and Bioinformatics Lab <sup>#</sup>	1.5
Cancer Biology and Therapy	3
Stem Cell Biology and Regenerative Medicine	3
Public Health	3
Translational Medicine	3
Introduction to Computer Science	3
Probability and Statistics	3
Numerical Methods and Computation	3
Web Programming	3
Advanced Database Systems	3
Digital Image Processing	3
Artificial Intelligence	3
Information Retrieval and Web Search	3
Data and Information Visualization	3
Cloud Computing and Big Data Systems	3
Machine Learning	3
Pattern Recognition	3

# Student who take this course must additionally take 1 more course from the above list to fulfil credit requirement.