# STUDY PLAN - BACHELOR OF SCIENCE

**Version 4 - For student admitted in before SP52/2022**

*Students who have not completed high school Mathematical Methods or equivalent must enrol in MA1020 Preparatory Maths as an elective level 1 subject at Term 1

**COURSE STRUCTURE FOR BSCI (AQUACULTURE & TECHNOLOGY MAJOR)**

**6 General core subjects**
SC1101 & SC1102
SC2202
SC3008 or SC3901
Plus
2 Skill Subjects

+ **8 Core subjects under** Aquaculture & Technology Major +

**2 Breadth Subjects**
AND
**8 Elective subjects including:**
3 subjects from Level 2 or 3 or 5 Science subjects
1 subject from 3 or 5 Science subjects
2 subjects from any Level 1, 2, 3 or 5 subjects
2 subjects from any Level 3 or Level 5 subjects

**COURSE STRUCTURE FOR BSCI (DATA SCIENCE MAJOR)**

**6 General core subjects**
SC1101 & SC1102
SC2202
SC3008 or SC3901
Plus
2 Skill Subjects

+ **8 core subjects** under Data Science Major +

**2 Breadth Subjects**
AND
**8 Elective subjects including:**
3 subjects from Level 2 or 3 or 5 Science subjects
1 subject from 3 or 5 Science subjects
2 subjects from any Level 1, 2, 3 or 5 subjects
2 subjects from any Level 3 or Level 5 subjects

**COURSE STRUCTURE FOR BSCI (INTERNET OF THINGS MAJOR)**

**6 General core subjects**
SC1101 & SC1102
SC2202
SC3008 or SC3901
Plus
2 Skill Subjects

+ **8 core subjects** under Internet of Things Major +

**2 Breadth Subjects**
AND
**8 Elective subjects including:**
3 subjects from Level 2 or 3 or 5 Science subjects
1 subject from 3 or 5 Science subjects
2 subjects from any Level 1, 2, 3 or 5 subjects
2 subjects from any Level 3 or Level 5 subjects

**Important Note:**
**Students must successfully complete 18 credit points of Level 1 and 2 science subjects before attempting any Level 3 science subject.**

**6 GENERAL CORE SUBJECTS For All Majors**

| | Subject Code | Subject Name | Pre-requisites | Year 2023 SP51 | SP52 | SP53 | Year 2024 SP51 | TR2 | TR3 |
|---|---|---|---|---|---|---|---|---|---|
| 3 subjects Level 1 & 2 | SC1101 | Science, Technology and Truth | | √ | √ | √ | √ | √ | √ |
| | SC1102 | Modelling Natural Systems | MA1020/Senior Maths or equivalent. | √ | √ | √ | √ | √ | √ |
| | SC2202 | Quantitative Methods in Science | SC1102 OR Students from BBusEnvSc Program (Assume Knowledge: Good understanding of Level 1 science, including at least 2 Level 1 subjects) | | √ | | √ | | √ |
| 1 subject Level 3 to be selected from here | SC3008 | Professional Placement | Offered every term. Completed 4 second year subs & enrolled in BSCI final year. To apply for this subject student need to apply to Careers Office at least 1 term ahead (careers-singapore@jcu.edu.au). To extend 1 trimester of studies so Professional Internship is the last subject remaining | | | | | | |
| | OR — Select 1 | | | | | | | | |
| | SC3901 | Special Topic 1 | Offered every term. To request enrolment in this subject student's should (1) attain approval from a research supervisor (usually an academic or research staff member in the College), (2) identify a project in consultation with the supervisor, and (3) email confirmation from supervisor and a brief description of the project to the subject coordinator. | | | | | | |
| 2 Skill Subject-List 2 | **Select 2 Skill Subjects from List 2 (Refer to Appendix List of Skill Subjects in the right side)** * Student with IOT major must take MA2000 in order to meet pre-req requirement of core subject EE2201. | | | | | | | | |

**18 SUBJECTS FOR Aquaculture Science & Technology Major**

| | Subject Code | Subject Name | Pre-requisite | Year 2023 SP51 | SP52 | SP53 | Year 2024 SP51 | TR2 | TR3 |
|---|---|---|---|---|---|---|---|---|---|
| 8 core subjects | BS1001 | Introduction to Biological Processes | (Assumed Knowledge: Good understanding of English to Grade 12 or equivalents.) | | √ | | √ | | √ |
| | BS1007 | Introduction to Biodiversity | (Assumed Knowledge: Good understanding of English to Grade 12 (Queensland) or equivalent) | √ | | √ | | √ | |
| | BS2470 | Evolution | BS1001 (Assumed Knowledge: Have completed 12 credit points of level 1 science subjects, have an understanding of the fundamentals of biology (BS1001 or equivalent).) | √ | | √ | √ | √ | |
| | MI2031 | Diagnosis of Bacterial Diseases in Aquaculture | | √ | | | √ | | |
| | AQ2001 | Introduction to Aquaculture | 4 Level 1 Science subjects (Assumed Knowledge: Good understanding of level 1 biology, particularly zoology. A basic understanding of chemistry and statistics is highly recommended) | | √ | | √ | | √ |
| | AQ3002 | Aquaculture: Feeds and Nutrition | 4 of Level 2 AQ, BC, BZ, BS, CH, EA, EV, MA, MB or PH science subjects and 1 of level 2 aquaculture subjects. | | √ | | √ | | √ |
| | AQ3003 | Aquaculture: Propagation | AQ2001 and at least 4 subjects of Level 2 science subjects. (Assumed Knowledge: Good understanding of basic biology and aquaculture principles.) | | √ | | √ | | √ |
| | OR — Select 1 | | | | | | | | |
| | AQ3004 | Aquaculture: Stock Improvement | At least 4 subjects of Level 2 science subjects and 1 subject of level 2 aquaculture subjects. (Assumed Knowledge: Good understanding of basic biology, physiology, genetics and aquaculture, and should have completed SC2202 AND AQ2001 or equivalent.) | √ | | √ | | √ | |
| | AQ3015 | Sustainable Aquaculture | 4 Level 2 subjects | √ | | √ | | √ | |
| Plus 2 breadth subjects from List 1 | Select any 2 subjects (except BS1001 & BS1007 ) from Breadth Subjects in List 1 - List of Breath Subjects at Appendix | | | | | | | | |
| Plus 8 elective subjects | Select 3 subjects from any Level 2, 3 or 5 Science subjects **(See List of Science Subjects Level 2, 3, 5 at Appendix )**<br>Select 1 subject from any Level 3 or 5 Science subjects **(See List of Science Subjects Level 3, 5 at Appendix )** | | | | | | | | |
| | Select 2 subjects from any Level 1, 2, 3 or 5 subjects- can choose from other majors or refer to Study Plan of other undergraduate program e.g. Business, Arts, Psychology- make sure you meet pre-requisite requirement. Students who have not completed high school Mathematical Methods or equivalent must enrol in MA1020 Preparatory Maths as an elective Level 1 subject at Term 1. | | | | | | | | |
| | Select 2 subjects from any Level 2,3 or Level 5 subjects-can choose from other majors or refer to Study Plan of other undergraduate program e.g. Business, Arts, Psychology)- make sure you meet pre-requisite requirement | | | | | | | | |

**18 SUBJECTS FOR Data Science Major**

| | Subject Code | Subject Name | Pre-requisite | Year 2023 SP51 | SP52 | SP53 | Year 2024 SP51 | TR2 | TR3 |
|---|---|---|---|---|---|---|---|---|---|
| 8 core subjects | MA1580 | Foundations of Data Science | MA1000 or MA1020 or Maths B | √ | | √ | √ | | √ |
| | MA1000 | Mathematical Foundations | MA1020 OR Maths B OR Maths C | √ | | √ | √ | √ | |
| | OR — Select 1 | | | | | | | | |
| | CP1404 | Programming II | CP1401 | √ | √ | √ | √ | √ | √ |
| | MA2405 | Advanced Statistical Modelling | SC2202 AND MA1000 | √ | | √ | | √ | |
| | MA3405 | Statistical Data Mining for Big Data | MA2405 or MA2000 or SC2202 | √ | √ | | √ | √ | |
| | MA3831 | Natural Language Processing, Web Scraping and Large Data Processing | CP1404 and' MA3405 | | √ | | √ | | √ |
| | MA3832 | Neural Network and Deep Learning | MA3405 and CP1404 | | √ | | √ | | √ |
| | OR — Select 1 | | | | | | | | |
| | MA3212 | Optimisation and Operations Research | MA2000 and MA2210 | √ | | | | √ | |
| | **Plus 2 subjects from below list (Don't select CP2404 and/or MA2210 if they are already taken in Skill Subjects List).** | | | | | | | | |
| | CP2404 | Database Modelling | | √ | | √ | √ | √ | |
| | MA2210 | Linear Algebra | MA1003. Recommended to complete MA2000. | | √ | | √ | | √ |
| | MA2211 | Discrete Mathematics | Maths B or MA1020 | √ | | √ | | √ | |
| | MA2830 | Data Visualisation | | √ | | √ | | √ | |
| Plus 2 breadth subjects | CP1401 | Problem Solving and Programming I | | √ | √ | √ | √ | √ | √ |
| | MA1000 | Mathematical Foundations | MA1020 OR Maths B OR Maths C | √ | | √ | √ | √ | |
| | OR — Select 1 | | | | | | | | |
| | CP1404 | Programming II | CP1401 | √ | √ | √ | √ | √ | √ |
| Plus 8 elective subjects | Select 3 subjects from any Level 2, 3 or 5 Science subjects **(See List of Science Subjects Level 2, 3, 5 at Appendix )**<br>Select 1 subject from any Level 3 or 5 Science subjects **(See List of Science Subjects Level 3, 5 at Appendix )** | | | | | | | | |
| | Select 2 subjects from any Level 1, 2, 3 or 5 subjects- can choose from other majors or refer to Study Plan of other undergraduate program e.g. Business, Arts, Psychology)- make sure you meet pre-requisite requirement.<br>Note 1: Students who have not completed high school Mathematical Methods or equivalent must enrol in MA1020 Preparatory Maths as an elective level 1 subject at Term 1.<br>Note 2: Note: Student must select MA1003 as an elective level 1 in this option line if you wish to study MA2000, MA2210 & MA3212 (Student must meet pre-req of MA2000 & MA2210 before studying MA3212). | | | | | | | | |
| | Select 2 subjects from any Level 2,3 or Level 5 subjects-can choose from other majors or refer to Study Plan of other undergraduate program e.g. Business, Arts, Psychology)- make sure you meet pre-requisite requirement | | | | | | | | |

**18 SUBJECTS FOR Internet Of Things Major (IOT)**

| | Subject Code | Subject Name | Pre-requisite | Year 2023 SP51 | SP52 | SP53 | Year 2024 SP51 | TR2 | TR3 |
|---|---|---|---|---|---|---|---|---|---|
| 8 core subjects | EG1012 | Electric Circuits | Assumed Knowledge: This subject requires prior knowledge of Senior Mathematics B or MA1020 (or equivalent) OR Senior Mathematics C. | | √ | | | √ | |
| | CC1003 | Introduction to Microcontroller Programming | | √ | | √ | | √ | |
| | CC2003 | Internet of Things Devices and Software | CC1003 and EG1012 | | | √ | √ | | √ |
| | EE2201 | Circuit Theory | EG1012 & MA2000. Allow concurrent enrolment for MA2000. | | √ | | √ | | √ |
| | CC3003 | Internet of Things Systems and Security | CC2003 | | √ | | √ | | |
| | EE3901 | Sensor Technologies | EE2201 and CC2003 | √ | | √ | √ | | |
| | MA2405 | Advanced Statistical Modelling | SC2202 AND MA1000 | √ | | √ | | √ | |
| | MA3405 | Statistical Data Mining for Big Data | MA2405 or MA2000 or SC2202 | √ | √ | | √ | √ | |
| Plus 2 breadth subjects-List 1 | Select 2 subjects of Breadth Subjects-List 1 (See List of Breath Subjects at Appendix)<br>*Students admitted **before SP51/22** in IOT major must **Not** select MA1000 & MA1003 in List 1 of Breath Subjects.<br>*Student admitted **in SP51 22** must take MA1000 & MA1003 so you can take MA2000 then core subject EE2201 later on | | | | | | | | |
| Plus MA1000 + MA1003 + MA2000 + MA2210 + 4 elective subjects (For Students admitted before SP51/22) | MA1000 | Mathematical Foundations | MA1020 OR Maths B OR Maths C | √ | | √ | √ | √ | |
| | MA1003 | Mathematical Techniques | MA1000 | √ | | √ | | √ | |
| | MA2000 | Mathematics for Scientists and Engineers | MA1003 | | √ | | √ | | √ |
| | MA2210 | Linear Algebra | MA1003. Recommended to complete MA2000. | | √ | | √ | | √ |
| | Select 1 subjects from any Level 3 or 5 Science subjects **(See List of Science Subjects Level 3, 5 at Appendix)** | | | | | | | | |
| | Select 1 subjects from any Level 1, 2, 3 or 5 subjects- can choose from other majors or refer to Study Plan of other undergraduate program e.g. Business, Arts, Psychology)- make sure you meet pre-requisite requirement. Students who have not completed high school Mathematical Methods or equivalent must enrol in MA1020 Preparatory Maths as an elective level 1 subject at Term 1. | | | | | | | | |
| | Select 2 subjects from any Level 2,3 or Level 5 subjects-can choose from other majors or refer to Study Plan of other undergraduate program e.g. Business, Arts, Psychology)- make sure you meet pre-requisite requirement | | | | | | | | |
| OR — SELECT 1 | | | | | | | | | |
| Plus 8 elective subjects (For Students admitted in SP51/22 Only) | Select 3 subjects from any Level 2, 3 or 5 Science subjects **(See List of Science Subjects Level 2, 3, 5 at Appendix)**<br>Select 1 subjects from any Level 3 or 5 Science subjects **(See List of Science Subjects Level 3, 5 at Appendix)** | | | | | | | | |
| | Select 2 subjects from any Level 1, 2, 3 or 5 subjects- can choose from other majors or refer to Study Plan of other undergraduate program e.g. Business, Arts, Psychology)- make sure you meet pre-requisite requirement. Students who have not completed high school Mathematical Methods or equivalent must enrol in MA1020 Preparatory Maths as an elective level 1 subject at Term 1. | | | | | | | | |
| | Select 2 subjects from any Level 2,3 or Level 5 subjects-can choose from other majors or refer to Study Plan of other undergraduate program e.g. Business, Arts, Psychology)- make sure you meet pre-requisite requirement | | | | | | | | |

***Note: Changes that are recently made will be highlighted in yellow and/or red fonts.***
***Disclaimer: The above information is correct as below date. Due to unforeseen situation/s, there might be change/s done in subject offerings before each trimester. Your understanding is greatly appreciated.***

# APPENDIX

## 1/. LIST 1 OF BREADTH SUBJECTS

Reminder:
1/. All students must select 2 subjects from this list.
- For IOT major: students admitted ***before SP51/22*** must select any 2 subjects from this list ***except MA1000 & MA1003*** which are already core of your major; students admitted **in SP51/22 must select MA1000 & MA1003.**
- For Data Science major: students must select CP1401 & CP1404 or MA1000.
- For Aquaculture & Technology major: students must not select BS1001 & BS1007.

| Subject Code | Subject Name | Pre-requisites | Year 2023 SP51 | SP52 | SP53 | Year 2024 SP51 | TR2 | TR3 |
|---|---|---|---|---|---|---|---|---|
| BS1001 | Introduction to Biological Processes | (Assumed Knowledge: Good understanding of English to Grade 12 or equivalents.) | | √ | | √ | | √ |
| BS1007 | Introduction to Biodiversity | (Assumed Knowledge: Good understanding of English to Grade 12 (Queensland) or equivalent) | √ | | √ | | √ | |
| CP1401 | Problem Solving and Programming I | | √ | √ | √ | √ | √ | √ |
| CP1404 | Programming II | CP1401 | √ | √ | √ | √ | √ | √ |
| EA1110 | Evolution of the Earth | | | √ | | | | √ |
| EV1005 | Environmental Processes and Global Change | | | √ | | √ | | √ |
| MA1000 | Mathematical Foundations | MA1020 OR Maths B OR Maths C | √ | | √ | √ | √ | |
| MA1003 | Mathematical Techniques | MA1000 | √ | | √ | | √ | |

## 2/. LIST 2 OF SKILL SUBJECTS

Reminder: All students must select **2** subjects from this list.

| Subject Code | Subject Name | Pre-requisite | Year 2023 SP51 | SP52 | SP53 | Year 2024 SP51 | TR2 | TR3 |
|---|---|---|---|---|---|---|---|---|
| CP2404 | Database Modelling | | √ | | √ | √ | √ | |
| EV2502 | Introduction to Geographic Information Systems | 4 level 1 subjects | | √ | | √ | | √ |
| MA2000 | Mathematics for Scientists and Engineers | MA1003 | | √ | | √ | | √ |
| MA2210 | Linear Algebra | MA1003. Recommended to complete MA2000. | | √ | | √ | | √ |
| MA2830 | Data Visualisation | | √ | | √ | | √ | |

## 3/. LIST OF SCIENCE SUBJECTS LEVEL 2,3,5

| Subject Code | Subject Name | Pre-requisite | Year 2023 SP51 | SP52 | SP53 | Year 2024 SP51 | TR2 | TR3 |
|---|---|---|---|---|---|---|---|---|
| AQ2001 | Introduction to Aquaculture | 4 Level 1 Science subjects (Assumed Knowledge: Good understanding of level 1 biology, particularly zoology. A basic understanding of chemistry and statistics is highly recommended) | | √ | | √ | | √ |
| AQ2002 | Aquaculture of Tropical Species | 4 Level 1 Science subjects (Assumed Knowledge: Good understanding of basic biology) | √ | | √ | | √ | |
| AQ3002 | Aquaculture: Feeds and Nutrition | 4 of Level 2 AQ, BC, BZ, BS, CH, EA, EV, MA, MB or PH science subjects and 1 of level 2 aquaculture subjects. | | √ | | √ | | √ |
| AQ3003 | Aquaculture: Propagation | AQ2001 and at least 4 subjects of Level 2 science subjects. (Assumed Knowledge: Good understanding of basic biology and aquaculture principles.) | | √ | | √ | | √ |
| AQ3004 | Aquaculture: Stock Improvement | At least 4 subjects of Level 2 science subjects and 1 subject of level 2 aquaculture subjects. (Assumed Knowledge: Good understanding of basic biology, physiology, genetics and aquaculture, and should have completed | √ | | √ | | √ | |
| AQ3015 | Sustainable Aquaculture | 4 Level 2 subjects | √ | | √ | | √ | |
| BS2460 | Fundamentals of Ecology | 2 Level 1 or 2 BZ/BS/EV subjects (Assumed Knowledge: Good understanding of level 1 biology or environmental science and are also recommended to have completed some introductory statistics prior to enrolling) | | √ | | √ | | √ |
| BS2470 | Evolution | BS1001 (Assumed Knowledge: Have completed 12 credit points of level 1 science subjects, have an understanding of the fundamentals of | √ | | √ | √ | √ | |
| CP2403 | Information Processing and Visualisation | Minimum 12 credit points of subjects. (Inadmissible with CP3413) | | √ | √ | | √ | √ |
| CP2404 | Database Modelling | | √ | | √ | √ | √ | |
| CP2405 | Collective Intelligence and Entrepreneurship | Minimum 24 credit points. | √ | √ | | √ | √ | |
| CP2406 | Programming III | CP1404 | √ | | √ | √ | | √ |
| CP2408 | Design Thinking II | CP1403 | √ | √ | √ | √ | √ | √ |
| CP2409 | Network Forensics and Data Communications | CP1402 | √ | | √ | | √ | |
| CP2410 | Algorithms and Data Structures | 6 credit points of CP subjects | √ | | √ | | √ | |
| CP2411 | 3D Modelling and Animation | 6 credit points of CP subjects | √ | | | √ | | |
| CP2412 | Game Design and Technologies | 6 credit points of CP subjects | √ | | | | √ | |
| CP2414 | Network Security | For BBUS Student: 3 credit points of CP subjects; For Student in other Program CP1402 | √ | | √ | √ | | √ |
| CP2421 | Machine Learning for Cybersecurity | CP1401 and MA1580 | | √ | | √ | | √ |
| CP2422 | Cloud and Data Centre Security | CP1401 | | √ | √ | | √ | √ |
| CP2423 | Cybersecurity Infrastructure and Management | CP1401 and CP1410 | | √ | √ | √ | | √ |
| CP2424 | Cybersecurity Risk Management | 12 credit points of CP subjects including CP1410 | √ | | √ | √ | √ | |
| CP3401 | e-Strategic Management | Minimum of 24 credit points | | √ | **0** | √ | | √ |
| CP3402 | Content Management Systems | CP1404 and CP1406 and 24 credit points of CP subjects | √ | | √ | | √ | |
| CP3403 | Data Mining | (CP2403 and CP2404) or (18 credit points of subjects including 6 credit points of CP subjects).Inadmissible Subject : CP5634 | √ | √ | | √ | √ | |
| CP3404 | Information Security | (CP2414) or (18 credit points of subjects including CP1402) | √ | | √ | | √ | |
| CP3405 | Design Thinking III | CP2408 | √ | √ | √ | √ | √ | √ |
| CP3406 | Mobile Computing | CP1404 and 18 credit points of CP subjects | √ | | √ | √ | | √ |
| CP3407 | Advanced Software Engineering | CP1404 and 18 credit points of CP subjects | √ | √ | | √ | √ | |
| CP3408 | Game Engine and Simulation | CP1404 and 18 credit points of CP subjects | | √ | | | | √ |
| CP3413 | Information Processing and Visualisation | 12 credit points of BU/BX subjects (Inadmissable with CP2403) | | √ | √ | | √ | √ |
| CP3414 | Ethical Hacking | CP2422, CP2423 | √ | √ | √ | √ | √ | √ |
| CP3415 | Strategy and Governance | CP2424 | | √ | | √ | | √ |
| CP3416 | Behavioural Cybersecurity | 36 credit points of CP or MA subjects | | √ | | √ | | √ |
| CP3417 | Cybersecurity for Operational Technology | CP2423 | √ | | √ | | √ | |
| CP3418 | Best Practices in Cybersecurity | CP3414 | √ | √ | √ | √ | √ | √ |
| EE2201 | Circuit Theory | EG1012 & MA2000. Allow concurrent enrolment for MA2000. | | √ | | √ | | √ |
| EE3901 | Sensor Technologies | EE2201 and CC2003 | √ | | √ | √ | | |
| EV2011 | The Case for Sustainability | | | √ | | √ | | √ |
| EV2502 | Introduction to Geographic Information Systems | 4 level 1 subjects | | √ | | √ | | √ |
| EV3011 | Sustainability in Practice | | | √ | | √ | | √ |
| EV3110 | Environmental and Social Impact Assessment | 4 level 2 subjects | | √ | | √ | | √ |
| MA2000 | Mathematics for Scientists and Engineers | MA1003 | | √ | | √ | | √ |
| MA2210 | Linear Algebra | MA1003. Recommended to complete MA2000. | | √ | | √ | | √ |
| MA2211 | Discrete Mathematics | Maths B or MA1020 | √ | | √ | | √ | |
| MA2405 | Advanced Statistical Modelling | SC2202 AND MA1000 | √ | | √ | | √ | |
| MA2830 | Data Visualisation | | √ | | √ | | √ | |
| MA3212 | Optimisation and Operations Research | MA2000 and MA2210 | √ | | | | √ | |
| MA3405 | Statistical Data Mining for Big Data | MA2405 or MA2000 or SC2202 | √ | √ | | √ | √ | |
| MA3831 | Natural Language Processing, Web Scraping and Large Data Processing | CP1404 and' MA3405 | | √ | | √ | | √ |
| MA3832 | Neural Network and Deep Learning | MA3405 and CP1404 | | √ | | √ | | √ |
| MB3200 | Marine Conservation Biology | SC2202 or BS2460 | √ | | √ | | √ | |
| MB5001 | Tropical Marine Ecology and Coastal Impacts | Available to undergraduate students in their third year with a GPA >5 (Assumed Knowledge: students are assumed to have a basic understanding of ecological principles and techniques as well as some background in statistics and sampling design. A basic understanding of marine biodiversity is also assumed) | | | √ | | | √ |
| MI2031 | Diagnosis of Bacterial Diseases in Aquaculture | | √ | | | √ | | |

* To request enrolment in this subject student's should (1) attain approval from a research supervisor (usually an academic or research staff member in the College), (2) identify a project in consultation with the supervisor, and (3) email confirmation from supervisor and a brief description of the project to the subject coordinator.

**Updated on 20 December 2023**