COURSE OUTLINE

# MHN703 Neuroimaging Advances in Mental Health

**School:** School of Health - Psychology

2025 | Semester 2

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|---|---|---|
| Online | ONLINE | You can do this course without coming onto campus, unless your program has specified a mandatory onsite requirement. |

*Please go to unisc.edu.au for up to date information on the teaching sessions and campuses where this course is usually offered.*

## 1. What is this course about?

### 1.1. Description

Magnetic resonance imaging (MRI) allows researchers to understand how the brain is wired in health and disease. This course will introduce you to the latest imaging technologies used in mental health and neuroscience research, with a focus on MRI. You will also explore transcranial magnetic stimulation, magnetic resonance spectroscopy, and electroencephalography techniques and how they are used in machine learning. You'll understand the role of neuroimaging biomarkers in mental health risk profiling, diagnosis and treatment, and how neuroimaging supports the pursuit of new knowledge.

### 1.2. How will this course be delivered?

| ACTIVITY | HOURS | BEGINNING WEEK | FREQUENCY |
|---|---|---|---|
| **ONLINE** | | | |
| **Online** – The online activities will include a variety of asynchronous, interactive learning materials, and options for lecturer and peer to peer collaborations, and lecturer and peer zoom drop-ins. | 3hrs | Week 1 | 13 times |

### 1.3. Course Topics

- The principles and safety of Magnetic Resonance Imaging (MRI)
- MRI modalities
- Measuring brain function in different ways
- Imaging biomarkers for mental disorders
- Clinical application of novel techniques

## 2. What level is this course?

700 Level (Specialised)

Demonstrating a specialised body of knowledge and set of skills for professional practice or further learning. Advanced application of knowledge and skills in unfamiliar contexts.

## 3. What is the unit value of this course?

12 units

## 4. How does this course contribute to my learning?

| COURSE LEARNING OUTCOMES<br>On successful completion of this course, you should be able to... | | GRADUATE QUALITIES<br>Completing these tasks successfully will contribute to you becoming... |
|---|---|---|
| 1 | Build an advanced understanding of neuroimaging technologies and the scientific evidence base for use in mental health research. | Knowledgeable |
| 2 | Articulate and evaluate the application of advanced neuroimaging and data-driven approaches in treatment and understanding of mental health disorders. | Engaged |
| 3 | Review, critically appraise and synthesise the scientific evidence base in neuroimaging approaches and psychophysiological measures of brain and body functioning. | Creative and critical thinker |

## 5. Am I eligible to enrol in this course?

Refer to the UniSC Glossary of terms for definitions of "pre-requisites, co-requisites and anti-requisites".

### 5.1. Pre-requisites

Must be enrolled in program AR503, AR602 or AR706

### 5.2. Co-requisites

Not applicable

### 5.3. Anti-requisites

Not applicable

### 5.4. Specific assumed prior knowledge and skills (where applicable)

Not applicable

### 5.5. Microcredential Information

Not applicable

## 6. How am I going to be assessed?

### 6.1. Grading Scale

Standard Grading (GRD)

High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL).

### 6.2. Details of early feedback on progress

Formative example self-check questions will be provided in learning activities each week providing immediate feedback. A Zoom drop in session will be held prior to week 4 to respond to any questions regarding the learning activities and provide general feedback.

### 6.3. Assessment tasks

| DELIVERY MODE | TASK NO. | ASSESSMENT PRODUCT | INDIVIDUAL OR GROUP | WEIGHTING % | WHAT IS THE DURATION / LENGTH? | WHEN SHOULD I SUBMIT? | WHERE SHOULD I SUBMIT IT? |
|---|---|---|---|---|---|---|---|
| All | 1 | Portfolio | Individual | 50% | Maximum 40 questions plus 1000-2000 words | Refer to Format | Online Assignment Submission with plagiarism check |
| All | 2 | Essay | Individual | 50% | 3000 | Exam Period | Online Assignment Submission with plagiarism check |

### All - Assessment Task 1: Learning portfolio

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|---|---|
| **GOAL:** | The goal of this assessment task is to build your understanding of various MRI modalities and methodologies and apply this to then evaluate and critically appraise the utility of advanced neuroimaging in current diagnostic and treatment approaches to mental health disorders. |
| **PRODUCT:** | Portfolio |
| **AUTHORSHIP STATEMENT:** | |
| **FORMAT:** | Submit: Weeks 5, 7 & 9. You will respond to a series of activities throughout the first half of the course. You will submit these according to the guidelines provided at the timepoints of Week 5, 7 and 9. The activities will progress from quiz style questions to short answers and summaries. Your final submission will build on your foundational knowledge gained, and this will be applied to evaluate and appraise examples of advanced neuroimaging research that informs diagnosis or treatment for a specific mental health disorder. |
| **CRITERIA:** | |

| No. | | Learning Outcome assessed |
|---|---|---|
| 1 | Demonstration of building an advanced understanding of neuroimaging | 1 |
| 2 | Evaluation of the application of advanced neuroimaging | 2 |
| 3 | Articulation of advanced neuroimaging approaches | 2 |

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| **GENERIC SKILLS:** | Problem solving, Information literacy |

### All - Assessment Task 2: Critical Appraisal: Neuroimaging

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|---|---|
| **GOAL:** | The goal is to review and critically appraise the potential clinical use of neuroimaging biomarkers, including through data driven approaches, and how they can inform or predict mental disorder diagnosis, and treatment responses. |
| **PRODUCT:** | Essay |
| **AUTHORSHIP STATEMENT:** | |
| **FORMAT:** | You will prepare an academic essay with your peers as the target audience, following the provided guidelines for a relevant style. You will articulate and appraise the evidence base underpinning the use of neuroimaging biomarkers, including through data driven approaches. You will discuss how this can inform or predict diagnosis and prognosis, as well as the prediction and evaluation of response to treatment, avoidance of adverse advents and identification of specific subgroups. You will refer to at least one mental health disorder as an example. |
| **CRITERIA:** | |

| No. | | Learning Outcome assessed |
|---|---|---|
| 1 | Demonstration of building an advanced understanding of neuroimaging and the scientific evidence base for use in mental health research. | 1 |
| 2 | Critical appraisal of scientific evidence base in neuroimaging approaches and psychophysiological measures of the brain. | 3 |
| 3 | Synthesis of the utility of brain-based biomarkers in the context of mental health and neuroscience. | 3 |
| 4 | Articulation of evidence base of treatment approaches in mental health for an academic audience | 2 |
| 5 | Evaluation of the application of data-driven approaches in treatment and understanding of mental health disorders. | 2 |

| | |
|---|---|
| **GENERIC SKILLS:** | Communication, Problem solving, Applying technologies |

## 7. Directed study hours

A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Student workload is calculated at 12.5 learning hours per one unit.

## 8. What resources do I need to undertake this course?

Please note: Course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Canvas site– Please log in as soon as possible.

### 8.1. Prescribed text(s) or course reader

> There are no required/recommended resources for this course.

### 8.2. Specific requirements

All work submitted for assessment is to be word processed and submitted electronically. It is expected that students will have ready access to a computer with common productivity software and reliable Internet access.

## 9. How are risks managed in this course?

Health and safety risks for this course have been assessed as low. It is your responsibility to review course material, search online, discuss with lecturers and peers and understand the health and safety risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the online induction training for students, and following the instructions of the University staff.

## 10. What administrative information is relevant to this course?

### 10.1. Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Canvas, are electronically checked through Turnitin. This software allows for text comparisons to be made between your submitted assessment item and all other work to which Turnitin has access.

### 10.2. Assessment: Additional Requirements

**Eligibility for Supplementary Assessment**

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:
(a) The final mark is in the percentage range 47% to 49.4%; and
(b) The course is graded using the Standard Grading scale

### 10.3. Assessment: Submission penalties

Late submissions may be penalised up to and including the following maximum percentage of the assessment task's identified value, with weekdays and weekends included in the calculation of days late:
(a) One day: deduct 5%;
(b) Two days: deduct 10%;
(c) Three days: deduct 20%;
(d) Four days: deduct 40%;
(e) Five days: deduct 60%;
(f) Six days: deduct 80%;
(g) Seven days: A result of zero is awarded for the assessment task.

The following penalties will apply for a late submission for an online examination:
Less than 15 minutes: No penalty
From 15 minutes to 30 minutes: 20% penalty
More than 30 minutes: 100% penalty

## 10.4. Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Central Examinations
- Deferred Examinations
- Student Conduct
- Students with a Disability

For more information, visit https://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

## 10.5. Student Charter

UniSC is committed to excellence in teaching, research and engagement in an environment that is inclusive, inspiring, safe and respectful. The Student Charter sets out what students can expect from the University, and what in turn is expected of students, to achieve these outcomes.

## 10.6. General Enquiries

**In person:**

- **UniSC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **UniSC Moreton Bay** - Service Centre, Ground Floor, Foundation Building, Gympie Road, Petrie
- **UniSC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **UniSC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **UniSC Fraser Coast** - Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- **UniSC Caboolture** - Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture

**Tel:** +61 7 5430 2890

**Email:** studentcentral@usc.edu.au