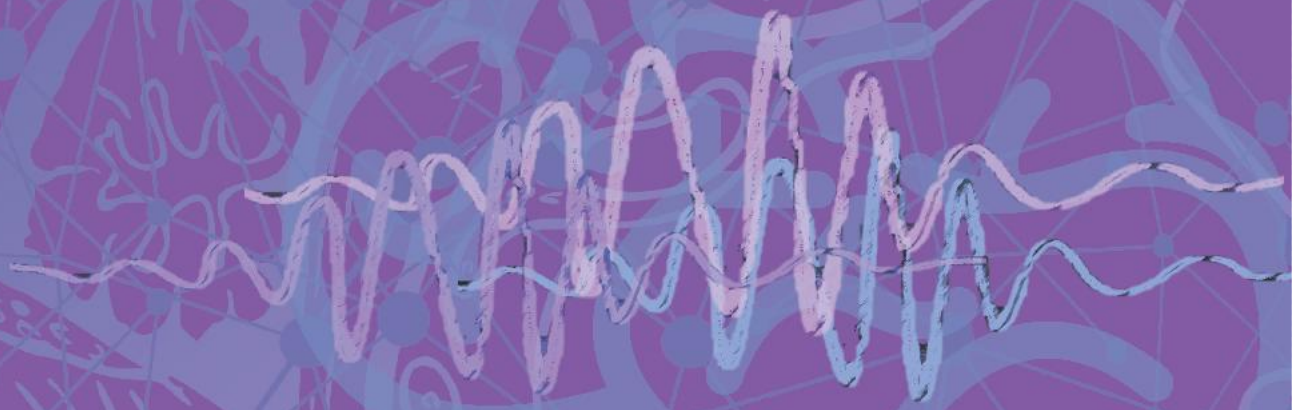
UNIVERSITI SAINS MALAYSIA

Program HANDBOOK



MASTER OF COGNITIVE NEUROSCIENCES

SARJANA NEUROSAINS KOGNITIF

Unleash Your Brain's Potential

PROGRAM HANDBOOK

MASTER OF COGNITIVE NEUROSCIENCES

MQA/SWA13788

School of Medical Sciences
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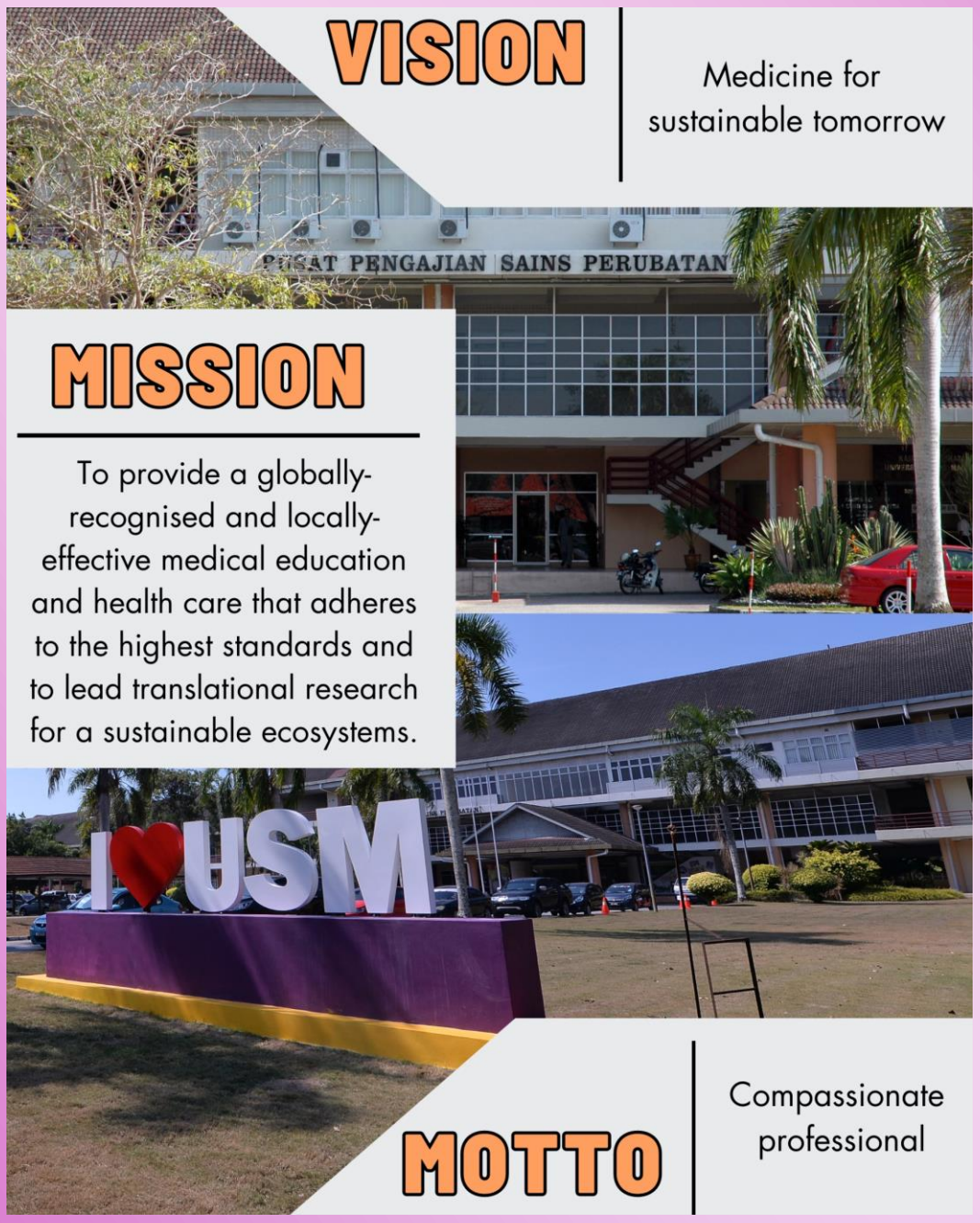
Table of Contents

About the School of Medical Sciences

The School of Medical Sciences, Universiti Sains Malaysia, was established in June 1979. In the early development of the school, the pre-clinical years were carried out on the Penang campus, while the clinical years were conducted on the Kelantan campus. The school was fully operational at Kubang Kerian, Kelantan, by June 1990. The Kubang Kerian, Kelantan Campus was established on 220 acres of land and encompasses the School of Medical Sciences and the USM Teaching Hospital, which was established in October 1983. The move to the Kelantan campus further consolidated the school's academic, service and research activities. The Kelantan campus is now known as the Health Campus, USM. Kubang Kerian is 6.6 km from Kota Bharu, the state capital of Kelantan. Kota Bharu has a population of around 420,000, while the population of Kelantan is 1.2 million.



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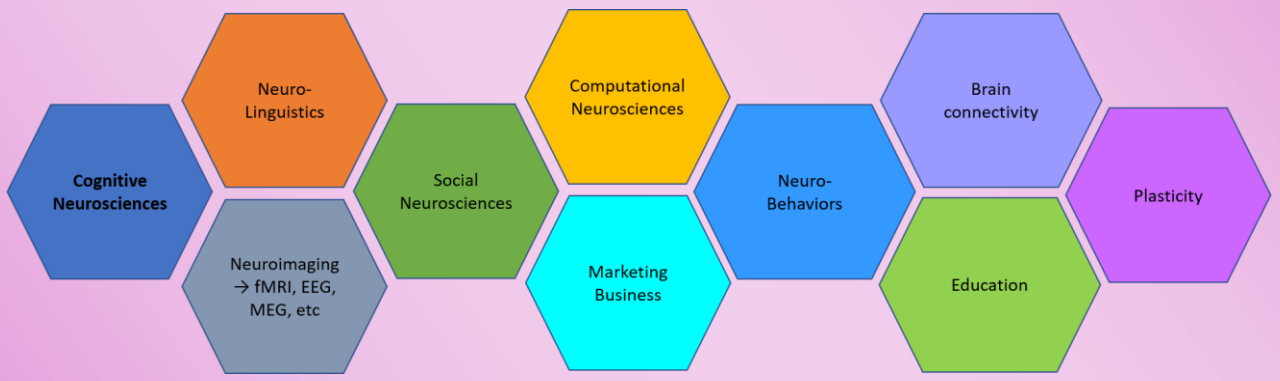
1.0 About the Master of Cognitive Neurosciences Program

1.1 Overview

Cognitive neuroscience is a multidisciplinary field investigating the intricate relationships between brain function, cognition, and behaviour. It integrates principles and methodologies from diverse disciplines, including neuroscience, psychology, brain imaging, social sciences, linguistics, education, computational science, and marketing, to better understand how the brain gives rise to cognitive processes and behavioural outcomes.

The field of cognitive neuroscience is gaining increasing importance in Malaysia due to the rising demand for experts and the rapid advancement of neurotechnology. According to Sumari, Idris, and Abdullah (2017) and the Academy of Sciences Malaysia (2017), the country is projected to require at least 10 cognitive neuroscience experts per 100,000 labour force members by 2050. However, the current number of qualified professionals remains limited (Academy of Sciences Malaysia, 2017; Cheah et al., 2017), mainly due to the lack of dedicated cognitive neuroscience programs at undergraduate and postgraduate levels. At the same time, global advancements in neurotechnology are driving new frontiers in cognitive neuroscience, with significant implications for education, healthcare, economic growth, and overall societal well-being (United Nations, 2016; Frantzidis et al. 2024). This convergence of need and innovation positions cognitive neuroscience as a critical discipline for Malaysia's future, offering opportunities to build multidisciplinary expertise and foster strategic development across multiple sectors (Academy of Sciences Malaysia, 2017).



Source:

Academy Of Sciences Malaysia. (2017). Malaysia Foresight Institute. The Foresight Malaysia 2050. Emerging Science, Engineering & Technology (Eset) Study. Kuala Lumpur.

Aini Ismafairus, B. A. H., Abdullah, J. M., & Fauzan, N. B. (2018). The future of cognitive neuroscience. International Journal of Engineering & Technology, 7(3.22), 1–4. https://doi.org/10.14419/ijet.v7i3.22.17111

Frantzidis, C. A., Peristeri, E., Andreou, M., & Cristea, A. I. (2024). Editorial: New challenges and future perspectives in cognitive neuroscience. Frontiers in human neuroscience, 18, 1390788. https://doi.org/10.3389/fnhum.2024.1390788

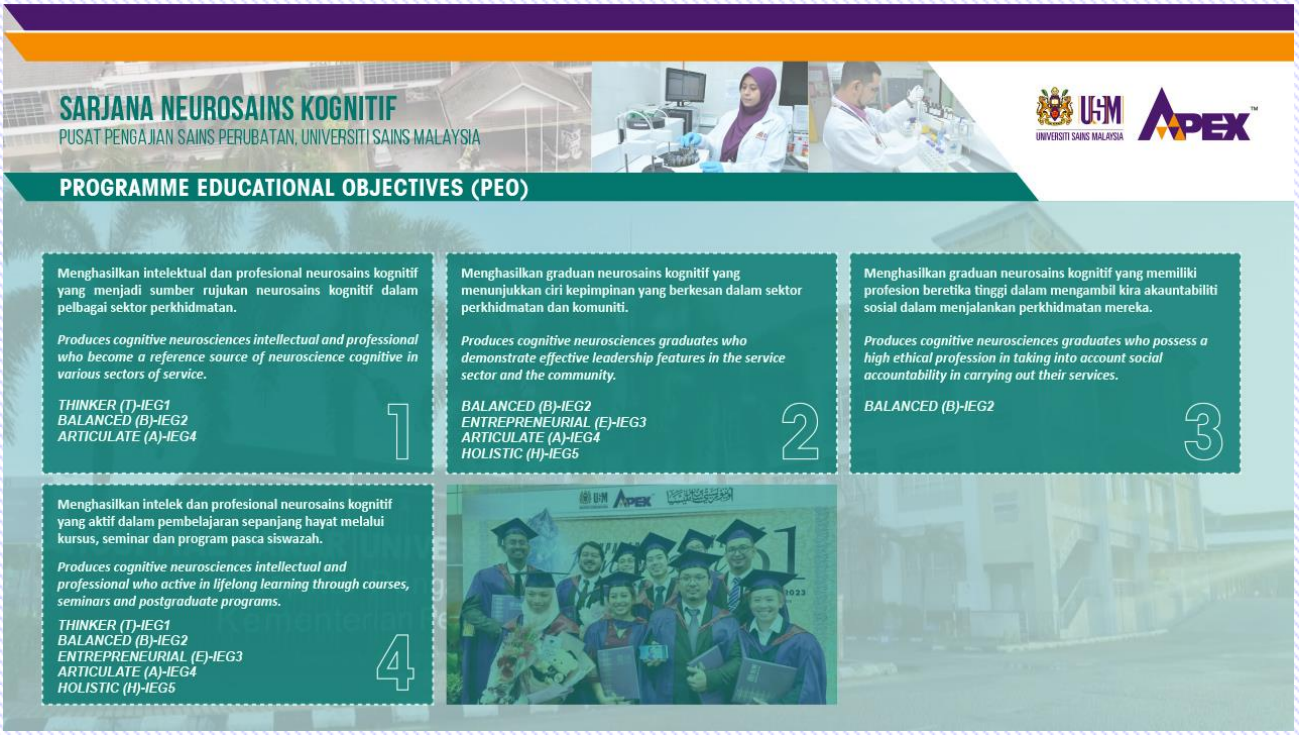
Sumari, P., Idris, Z., & Abdullah, J. M. (2017). We Must Invest in Applied Knowledge of Computational Neurosciences and Neuroinformatics as an Important Future in Malaysia: The Malaysian Brain Mapping Project. The Malaysian journal of medical sciences : MJMS, 24(1), 1–9. https://doi.org/10.21315/mjms2017.24.1.1

United Nations. (2016). Global Sustainable Development Report 2016. New York. Retrieved From Https://Sustainabledevelopment.Un.Org/Index.Php?Page=View&Type=400&Nr=2328&Menu=1515

1.2 Introduction to Program

This handbook provides essential information and guidelines for the Master of Cognitive Neurosciences program, offered by the School of Medical Sciences, Universiti Sains Malaysia. While the program is primarily conducted at USM Kuala Lumpur (USMKL), selected courses, workshops, and research activities may also take place at other USM campuses (Main Campus, Health Campus and IPPT). The School of Medical Sciences manages the program in collaboration with multiple academic and research entities, including the School of Computer Sciences, School of Educational Studies, School of Social Sciences, Graduate School of Business, School of Humanities, Centre for Drug Research, Institute of Islamic Understanding Malaysia, and the Institute of Postgraduate Studies.

1.3 Program Educational Objectives (PEO)



1.4 Program Learning Outcome (PLO)

2.0 Location

Item	Location
Core and elective courses	• Institute of Postgraduate Studies (IPS SAINS@KL), Level 20, MoF Inc. Tower, No. 9 Persiaran KLCC, 50088 Kuala Lumpur • USM Main Campus, 11800 Gelugor, Penang Malaysia • Institut Perubatan & Pergigian Termaju (IPPT), Universiti Sains Malaysia, Bertam 13200 Kepala Batas, Pulau Pinang
Research project	Institute of Postgraduate Studies (IPS SAINS@KL), Level 20, MoF Inc. Tower, No. 9 Persiaran KLCC, 50088 Kuala Lumpur *or/and* • USM Main Campus, 11800 Gelugor, Penang Malaysia. *or/and* • USM Health Campus, 16150 Kubang Kerian, Kelantan Malaysia *or/and* • Institut Perubatan & Pergigian Termaju (IPPT), Universiti Sains Malaysia,, Bertam 13200 Kepala Batas, Pulau Pinang

3.0 Entry Requirement

The basic eligibility requirements for entering the Master's Program of Cognitive Neuroscience are as follows:

- Bachelor's degree in any field from a recognised university with a minimum CGPA of 3.00 from 4.00
- *Applicant is subject to internal assessment by an independent review panel*

3.1 Language Requirement

English

Applicable for International Applicants Only

- A minimum of Band 5 for IELTS; or
- A minimum score of 40 for TOEFL (Internet-based); or
- A minimum of Band 7.5 for TOEFL Essentials (Online); or
- A minimum score of 154 for Cambridge English: Advance (CAE)/Proficiency (CPE) /Preliminary (PET) /First (FCE)/ Linguaskill Online; or
- A minimum score of 47 for Pearson Test of English (PTE); or
- A minimum of Band 107 for CIEP Level (ELS); or
- A minimum of Band 3.5 for Malaysian University English Test (MUET)

Exemption CAN BE CONSIDERED to candidate if:

- English is the candidate's mother tongue or National Language; or
- Candidate graduated from an Institution of Higher Learning in which the medium of instruction at Bachelor and/or Master degree level is English (statement of proof required)

Bahasa Malaysia

For international candidates who have attended the Bahasa Malaysia course while studying at the Institute of Higher Learning (IPTA) and the local Institute of Postgraduate Studies (IPTS), the exemption may be granted on the following terms:

- The courses attended and graduated by the students are in the list of courses provided by the School of Language, Literacy and Translation; and
- If a student has Bahasa Malaysia equivalent or higher than the LKM100 level which is not in the Language, Literacy and Translation Language Center, students are required to undergo a diagnostic test for exemption from registering and passing the LKM100 course.
- LKM300 - Bahasa Malaysia III from Universiti Sains Malaysia (USM) is recognised equivalent to Bahasa Malaysia SPM with honours

* Any changes will be updated from time to time

4.0 Application

This program is offered twice yearly, during the October (Semester I) and March (Semester II) intakes. Candidates can obtain their online application from:

Institute of Postgraduate Studies
Universiti Sains Malaysia
11800 Penang, Malaysia.
Telephone : +604 653 2606
Facsimile : +604 653 2940
Email : dean_ips@usm.my @ helpdesk_ips@usm.my
Website : www.ips.usm.my

If you have any additional inquiries or need further assistance, don't hesitate to contact the program coordinator and co-coordinator.

Dr. Aini Ismafairus Abd Hamid

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The information regarding registration and other relevant details for these studies can be provided from:

Postgraduate Division
School of Medical Sciences
Universiti Sains Malaysia
Health Campus, Kubang Kerian, Kota Bharu,
16150, Kelantan.
Contact person: Madam Wan Syarifah Aini Wan Ismail (Senior Assistant Registrar)/
Mr. Azman Bin Zulkifli (Administrative Assistant)
Telephone : 09-767 6052 / 6407 / 6053
Email : wanaini@usm.my / azmankk@usm.my

5.0 Registration

1. Successful candidates will register with the university upon the payment of applicable fees at the Institute of Postgraduate Studies (IPS USMKL).
2. Enrollment will commence at the beginning of the course (October/March) and must be renewed during each semester.

6.0 Fees

Malaysian (MYR)	International (USD)
• Registration Fee : 330.00 • Tuition Fee : 650.00 X 46 Units = 29,900 • Convocation Fee : 200.00	• Registration Fees : 225.00 • Personal Bond : 1000.00 • Tuition Fees : 550.00 X 46 Units = 25,300.00 • Convocation Fee : 50.00

** Fees are subject to change
(refer to https://rb.gy/37huzy for any updates)

7.0 Details of Program:

7.1 Programme Structure and Curriculum

Subject Classifications		Credit	Percentage *
1	Core Courses	20	43.5
2	Elective Courses	16	34.8
3	Research Project	10	21.7
Total		**46**	**100**

7.2 Duration of Study

Type of Study	Minimum	Maximum
Flexible (part-time & full-time)	2 years (4 semesters)	5 years (10 semesters)

- Full-time: 4 semesters (2 years) / 8 semesters (4 years)
- Part Time: 6 semesters (3 years) / 10 semesters (5 years)

7.3 List of Courses

In order to graduate, students are required to register for, successfully complete, and pass all core subjects. Additionally, they must register for and pass a minimum of four elective subjects offered throughout the study period. Each subject is offered either in Semester 1 or Semester 2. Only for the research project stages II and III are offered in both semesters. However, we will update any changes from time to time regarding the course information, assessments, etc.

Semester Offered	Core Courses (Compulsory – must register and pass all core courses)	Elective Courses (Must register and pass any four (4) elective courses offered throughout the study period)
Sem I	GCN501 Trends In Cognitive Neurosciences	GCN510 Computational neurosciences
	GCN502 Functional Neuroanatomy	GCN511 Genetics in cognitive neurosciences
	GCN504 Ethics, cross-cultural and professional issues	GCN512 Testing and assessment in cognitive neurosciences
	GCN505 Transferable skills	GCN513 Cognitive neurolinguistics
	GCN506 Statistics for clinical psychologists and cognitive neuroscientists	
Sem II	GCN503 Social Neurosciences	GCN514 Perception and attention control
	GCN507 Research methodology, protocol development in clinical psychology and cognitive neurosciences	GCN515 Plasticity and memory
	GCN508 Fundamentals in neuroimaging	GCN516 Brain and learning

Semester Offered	Core Courses (Compulsory – must register and pass all core courses)	Elective Courses (Must register and pass any four (4) elective courses offered throughout the study period)
	GCN509 Research project stage I	GCN517 Comparative cognitive neurosciences
		GCN518 Introduction to neuromarketing and consumer behaviour
		GCN521 Islam and Neurosciences
		GCN522 Art Therapy in Rehabilitation
Sem I & II	GCN519 Research project stage II	
	GCN520 Research project stage III	

*Pass: B- and above (52.0 marks and above)
**Fail: C+ and below (51.9 marks and below)

8.0 GCN501 Trends in Cognitive Neurosciences

8.1 Course Synopsis

8.1.1 Course Statement

This course aims to provide an in-depth understanding of cognitive neurosciences, focusing on cognition and the study of how neural substrates affect mental processes.

8.1.2 Course Credit

3 Credit units

8.2 Learning Objectives

Learning outcomes	1.	Assess the trends of cognitive trends in neuroscience.
	2.	To confirm the results of the previous scientific work to conclude with confidence.
	3.	To conduct research work with the latest technology
	4.	To explain the research works with ethical issues.
	5.	To formulate new ideas through literature review.

8.3 Teaching and Learning Arrangements

This course is taught through interactive lecture sessions which incorporate lectures, class discussions, seminars, assignments and presentations (individual and/or teamwork). Problem-based learning is a learning strategy that is simulated by real scenario, active learning and an approach to the ability to work in a team.

8.4 Learning Resources

Students can access learning materials, mainly journals and textbooks, from three libraries, which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

8.4.1 Main references:

Bradley R. Postle. (2020). Essentials of Cognitive Neuroscience, 2nd Edition. Wiley Blackwell

Gege N. M. & Baars J. B. (2018). Fundamentals of Cognitive Neuroscience: A Beginner's Guide. 2nd Edition. Academic Press, Elsevier.

Jamie Ward. (2020). The Students' Guide to Cognitive Neuroscience. 4th Edition. Routledge

Baars J. B. & Gege N. M. (2018). Fundamentals of Cognitive Neuroscience: A Beginner's Guide 2nd Edition. Academic Press, Elsevier.

Baars J. B. & Gage N. M. (2010). Cognition, Brain and Consciousness: Introduction to CognitiveNeuroscience. Elsevier

Gazzaniga M.S., Ivry R. B. & Mangun G. R. (2014). Cognitive Neuroscience: The Biology of the Mind. 4th Edition. W.W. Norton & Company.

Purves D, Cabeza R., Huettle S. A., LaBar K.S., Platt M.L. & Wolforff M. G. (2013). Principles of Cognitive Neuroscience. 2nd Edition Sinauer Associates Publisher.

8.4.2 Additional references:

Online website:
1. Related online journals such as Frontiers, PLOS One, etc
2. http://www.intechopen.com/subjects/neuroscience
3. USM website and library
4. http://healthycampus.usm.my/index.php/en/
5. https://www.cousera.org

8.5 Assessment

8.5.1 Assessment Summary

Form of Assessment	Weighting
Assignment (Individual and Group)	20%
Presentation/Seminar (Individual and Group)	20%
Teamwork	10%
Final Examination	50%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero marks.

9.0 GCN502 Functional Neuroanatomy

9.1 Course Synopsis

9.1.1 Course Statement

This core course intends to introduce the anatomical structures important for the cognitive neuroscientist. It will detail the tracts and connections between the different parts of the brain and it's relationship to the functions of the mind and behaviour.
This is an elective course which aims to introduce the functional neuroanatomy to students who intend to specialise further in advance neuropsychology at the doctorate level. This is important because acquired knowledge in this field would be applied in daily practice as well as in research as a clinical psychologist and clinical neuropsychologist.

9.1.2 Course Credit

2 Credit units

9.2 Learning Objectives

Learning outcomes	1.	Students should be able to differentiate the various structures and functions of the nervous system.
	2.	Students should be able to display the dysfunctions of human neuroanatomy and neurobiology (pathogenesis).
	3.	Students should be able to explain the ethical behaviour of the human brain and its component.
	4.	Students should be able to demonstrate the ability to correlate brain regions with cognitive functions with current knowledge.

9.3 Teaching and Learning Arrangements

This course is taught through lectures which incorporate tutorials, practical, seminars, case discussions and literature review. Anatomical human brain models dissected for the purpose to teach functional neuroanatomy will be used.

9.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

9.4.1 Main references:

Below are the reference textbooks available at the libraries:

Afifi, A. K. & Bergman, R.A. (2005). Functional Neuroanatomy: Text and Atlas. USA: Mc- Graw Hill Companies.

Bear, M.F., Connors, B.W. & Paradiso, M.A. (2007). Neuroscience: Exploring the brain. USA: Lippincott Williams & Wilkins.

Blumenfeld, H. (2010). Neuroanatomy through clinical cases. USA: Oxford University Press. Crossman,

A.R. & Near, D. (2010). Neuroanatomy. UK: Churchill Livingstone.

Gazzaniga, M.S., Ivry, R.B. & Margun, G.R. (2014). Cognitive neuroscience: The biology of the mind. USA: W.W. Norton & Company Inc.

Hendelman, W.M.D. (2006). Atlas of functional neuroanatomy. USA: Taylor & Francis Group. Kandel, E.R., Schwartz, J.H., Jessell, T.M., Siegelbaum, S.A., & Hudspeth, A.J. (2013). Principles of neural science. USA: Mc-Graw Hill Companies.

Martin, J.H. (2012). Neuroanatomy text and atlas. USA: Mc-Graw Hill Companies.

9.4.2 Additional references

For online resources for functional neuroanatomy, the websites are listed below:
1. http://www.atlasbrain.com/enx/atlas_main.html
2. http://www.intechopen.com/subjects/neuroscience
3. USM website and library: http://healthycampus.usm.my/index.php/en/

9.5 Assessment

9.5.1 Assessment Summary

Form of Assessment	Weighting
Assignment	20%
Involvement in planning	5%
Quality of work	5%
Discussion	20%
Final examination	50%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero marks.

10.0 GCN503 Social Neuroscience

10.1 Course Synopsis

10.1.1 Course Statement

This course aims to offer students with the extensive knowledge in the field of social neurosciences. Besides gaining knowledge in neurobiology, this course will equip the student with the social aspect of neuroscience which is beneficial as a cognitive neuroscientist, clinical psychologist and clinical neuropsychologist.

10.1.2 Course Credit

4 Credit units

10.2 Learning Objectives

Learning outcomes	1.	Students should be able to describe social process and behaviour through integrating biological explanations
	2.	Students should be able to address fundamental questions about the mind and its dynamic interactions with the biological systems of the brain and body and the social world
	3.	Students should be able to demonstrate critical thinking and higher knowledge in using biological concepts and methods to inform and refine theories of social processes and behaviour

10.3 Teaching and Learning Arrangements

This course is taught through lectures which incorporate tutorials, practical, seminars, case discussions and literature review.

10.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

10.4.1: Main references:

Below are the reference textbooks for reading:

Schutt, RK, Seidman LJ, Keshavan MS (2015). Social Neuroscience: Brain, Mind and Society. Oxford University Press: New York

Ward, J. (2012). The Student's Guide to Social Neuroscience. New York: Psychology Press

Todorov, A., Fiske, S.T. (2011). Social Neuroscience: Towards Understanding the Underpinnings of The Social Mind. Oxford University Press: New York

Cacioppo, J.T., Visser, P.S. and Pickett, C.L. (2006). Social neuroscience: People thinking about thinking people. Cambridge: MIT Press

Cacioppo, J.T. and Bernston, G.G. (2005). Social neuroscience. New York: Psychology Press

Harmon-Jones, E. and Winkielman, P. (2007). Social Neuroscience. New York: Guilford Press

Hewstone, M., Stroebe, W. and Jonas, K. (2012). An introduction to social psychology. Fifth Edition. Glasgow: BPS Blackwell

10.5 Assessment

10.5.1 Assessment Summary

Form of Assessment	Weighting
Assignments	30%
Quizzes	10%
Presentation	20%
Final examination	40%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.

Assessments not submitted officially will not be graded and will receive a zero mark.

All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero marks.

11.0 GCN504 Ethics, Cross-Cultural and Professional Issues

11.1 Course Synopsis

11.1.1 Course Statement

The broad aim of this course is to increase students' understanding and appreciation of the ethical and professional codes of practice as clinical psychologists and cognitive neuroscientist. This course will develop students' awareness and sensitivity in their clinical practice with clients of various cultural and religious backgrounds.

This is a shared code course for Master of Psychology (Clinical) and Master of Cognitve Neurosciences. Students will be informed from time to time regarding the teaching schedule and instructors relevant to their programme.

11.1.2 Course Credit

2 Credit units

11.2 Learning Objectives

Learning outcomes	1.	Students should be able to illustrate particular ethical dilemmas in professional clinical practice and to respond to the legal components of clinical psychology/cognitive neuroscientist need to be maintained according to standard
	2.	Students should be able to demonstrate the role of psychologists/cognitive neuroscientist in different settings as a part of teamwork.
	3.	Students should be able to demonstrate key issues in cross-cultural, religious, and indigenisation of clinical psychological/cognitive neuroscience theories and practices, and to organize information using appropriate techniques for cross-cultural, religious, and indigenisation of clinical psychological/cognitive neuroscience theories and practices.

11.3 Teaching and Learning Arrangements

1. This course is taught through interactive lecture session which incorporates lecture, class discussion, exercises and presentation.
2. The problem-based learning is a learning strategy that is stimulated by real scenarios, active learning and the ability to work in a team.

11.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

11.4.1 Main references:

Books, journals and periodicals (print and electronic):

Matsumoto, D. & Juang L. (2013). Culture and psychology. Belmont, CA: Wadsworth/Thomson Learning.

Chanlat, J.F., Davel, E., Dupuis., J.P. (2013). Cross-cultural management: Culture and management across the world. London: Routledge.

Jackson, T. (2011). International management ethics: A critical, cross-cultural perspective. New York: Cambrige University Press.

Koocher, P, G., Spiegel, K, P. (2011). International management ethics: A critical, cross-cultural perspective. USA: Oxford University Press.

Knapp, S. J., Vande-Creek, L. D. (2012). Practical ethics for psychologists: A positive approach. Washington, DC: American Psychological Association.

11.5 Assessment

11.5.1 Assessment Summary

Form of Assessment	Weighting
Assignments	30 %
Presentation (Simulation & Ethical Case Problem Solving Write-up)	30%
Final examination	40%
Total	**100 %**

All assessment tasks must be passed to obtain a final grade in this course.

Assessments not submitted officially will not be graded and will receive a zero mark.

All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero marks.

12.0 GCN505 Transferable Skills

12.1 Course Synopsis

12.1.1 Course Statement

The course is based on developing dynamic, motivated, interpersonal, intrapersonal and growing personalities. The course will highlight writing, conversation and analytical skills. This is specifically designed to promote communication, leadership, teamwork and problem-solving skills among postgraduate students by developing basic therapeutic skills and management skills in the field of Clinical Psychology and Cognitive Neurosciences.

This is a shared code course for Master of Psychology (Clinical) and Master of Cognitve Neurosciences. Students will be informed from time to time regarding the teaching schedule and instructors relevant to their programme.

12.1.2 Course Credit

1 Credit unit

12.2 Learning Objectives

Learning outcomes	Students should be able to evaluate the scientific paper and new technological findings within groups to improve scientific writing skills
	Students should be able to produce self-reflection and self-assessment reports of personal and professional development
	Students should be able to demonstrate problem solving skills for complex problems
	Students should be able to perform a presentation using effective communication skills
	Students should be able to organise information using appropriate techniques for transferable skills
	Students should be able to identify business opportunities in the field
	Students should be able to perform leadership skills as a group leader and group member

12.3 Teaching and Learning Arrangements

This course is taught through interactive lecture session which incorporates lecture, class discussion, exercises and presentation.

The problem-based learning is a learning strategy that is simulated by real scenarios, active learning and an approach to work in a team.

The practical work is also comprised by teamwork and community work.

12.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

12.4.1 Main reference

Denicolo, P. & Reeves, J. (2013). Developing transferable skills. UK: SAGE Publication.

12.4.2 Additional references

Brooks, J. (2007). Transferable academic skills kit: University foundation study teacher's book. UK: Garnet Education.

Covey, S.R. (2006). Eight habits of highly effective people. NY: Franklin Covey Co.

Lorayne, H. (2008). Secrets of mind power. Florida: Frederick Fell Publishers, Inc.

12.5 Assessment

12.5.1 Assessment Summary

Form of Assessment	Weighting
Assignments (Individual and Group)	20 %
Presentation	40%
Discussion (Teamwork)	20 %
Supervision (Community work/Relevant Project)	20%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.

Assessments not submitted officially will not be graded and will receive a zero mark.

All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero marks.

13.0 GCN506 Statistics for Clinical Psychologists & Cognitive Neuroscientists

13.1 Course Synopsis

13.1.1 Course Statement

This course includes lectures, a reporting assignment, and problem-based tutorials. It stresses on hands-on knowledge and skills transfer of intermediate statistical methods for clinical and neurocognitive purposes. Students will be required to use statistical software to analyse data. This is a comprehensive course requiring students' cognitive & psychomotor aptitudes.

Students must have passed modern mathematic at Sijil Pelajaran Malaysia level with the minimum grade of C or equivalent.

This is a shared code course for Master of Psychology (Clinical) and Master of Cognitve Neurosciences. Students will be informed from time to time regarding the teaching schedule and instructors relevant to their programme.

13.1.2 Credit of Course

2 Credit units

13.2 Learning Objectives

Learning outcomes	1.	Students should be able to apply various statistical methods
	2.	Students should be able to use statistical software
	3.	Students should be able to solve scientific enquiries using appropriate statistical methods
	4.	Students should be able to report on the results of the analysis

13.3 Teaching and Learning Arrangement:

This course is taught through interactive lecture sessions which incorporate lecture, class discussion, seminar, assignment and presentation.

The problem-based learning is a learning strategy that simulated by real scenario, active learning and an approach in the ability to work in a team to produce a report.

13.4 Learning Resources

13.4.1 Main references

Agresti, A. (2015). *Foundations of linear and generalized linear models*. NY: John Wiley & Sons. (ISBN: 9781118730058)

Allen, P., Bennett, K. & Heritage, B. (2014). SPSS Statistics Version 22: A Practical Guide. Australia: Cengage. (ISBN: 9780170348973)

Byrne, B. M. (2010) Structural equation modeling with AMOS: Basic concepts, applications and Programming. N.Y: Routledge. (ISBN: 978-0805863734)

Crawley, M.J. (2014). *Statistics: An introduction using R*. NY: John Wiley & Sons.

Diggle, P.J. & Chetwynd, A.G. (2011) Statistics and scientific method: An Introduction for students and researchers. Oxford: Oxford University Press. (ISBN: 9780199543182)

Stevens, J.P. (2009) Applied multivariate statistics for the social sciences. 5th Ed. N.Y. : Routledge. (ISBN: 978-0805859034)

Tabachnick, B.G. & Fidell, L.S. (2015) Using Multivariate statistics (6th Ed.). Boston: Pearson (ISBN: 978-0205849574)

13.5 Assessment

13.5.1 Assessment Summary

Form of Assessment	Weighting
Tutorial	40%
Report	20%
Final Examination	40%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero marks.

14.0 GCN507 Research Methodology, Protocol Development in Clinical Psychology and Cognitive Neurosciences

14.1 Course Synopsis

14.1.1 Course Statement

This course will provide students with the practical aspects of conducting a literature search, literature review and writing a research proposal. To provide and train students in designing and collecting data using various quantitative research methods. Students will learn how to report findings and references.

This is a shared code course for Master of Psychology (Clinical) and Master of Cognitive Neurosciences. Students will be informed from time to time regarding the teaching schedule and instructors relevant to their programme.

14.1.2 Course Credit

3 Credit units

14.2 Learning Objectives

On completion of this course Students should be able to:

Learning outcomes	1.	Students should be able to evaluate various research methods
	2.	Students should be able to organise data using different research method and approaches
	3.	Students should be able to propose a research proposal according to APA Standards
	4.	Students should be able to demonstrate ethical guidelines in research proposal
	5.	Students should be able to organise information using appropriate methods for the research proposal

14.3 Teaching and Learning Arrangements

This course is taught through interactive lecture sessions which incorporate lecture, class discussion, seminar, assignment and presentation.

The problem-based learning is a learning strategy that simulated by real scenario, active learning and an approach in the ability to work in a team.

The practical work is also comprised of individual and teamwork.

14.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

14.4.1 Main references:

Giles D. (2015) Advanced Research Methods in Psychology. Routledge (ISBN: 978-0415653466)

Stangor C. (2010) Research Methods for the Behavioral Sciences (Quantitative Methods in Psychology). Wadsworth Publishing (ISBN: 978-0840031976)

Morling B. (2014) Research Methodology in Psychology: Evaluating a World of Information (2nd Edition). W. W. Norton & Company (ISBN: 978-0393936933)

14.4.2 Additional references

Picardi C.A. & Masick K. D. (2013) Research Methodology: Designing & Conducting Research with a Real-World Focus. SAGE Publications (ISBN: 978-1452230337)

List of Journal
American Psychologists *
Applied Psychology: An International Review *
Australian Journal of Psychology
British Journal of Psychology
Clinical Psychologists
Clinical Psychology and Psychotherapy
Clinical Psychology Review
Journal of Applied Psychology *
Jurnal Psikologi Malaysia
Professional Psychology: Research and Practice *

* Recommended

Online website:
American Psychological Association www.apa.org
British Psychological Society www.bps.org.uk

14.5 Assessment

14.5.1 Assessment Summary

Form of Assessment	Weighting
Teaching and Simulation	20%
Assignment (Individual and Group)	10%
Practical Report	30%
Final Examination	40%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero marks.

15.0 GCN508 Fundamentals in Neuroimaging

15.1 Course Synopsis

15.1.1 Course Statement

This course provides exposure to neuroimaging methods such as MRI, fMRI, EEG, MEG and DWI to identify the brain structure studied during neuroanatomy modules and understood cognitive function in healthy individuals and compare them with patients. This course is specifically designed for the students to be able to learn the basic principles of neuroimaging methods and integrate the knowledge and understanding of neuroimaging in the context of cognitive research in a multi-disciplinary environment.

15.1.2 Course Credit

3 Credit units

15.2 Learning Objectives

Learning outcomes	1.	The student should be able to explain the various basic knowledge of neuroimaging principles
	2.	The student should be able to explain the neuroimaging in the context of cognitive research in the multi-disciplines to generate ideas for research.
	3.	The student should be able to integrate and manage various sources of information efficiently.
	4.	The student should be able to do work based on guidelines and ethics.
	5.	The student should be able to demonstrate scientific evidence using various modes of communication technology

15.3 Teaching and Learning Arrangements

This course is taught through interactive lecture sessions which incorporate lecture, class discussion, seminar, assignment and presentation.

The problem-based learning is a learning strategy that is simulated by real scenarios, active learning and an approach to work in a team.

The practical work is also comprised of individual and teamwork.

15.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

15.4.1 Main references:

Albert Gjedde, Soren B. Hansen, Gitte M. Knudsen, Olaf B. Paulson (2001). Physiological imaging of the brain with PET. Elsevier Science

Blaine L. Hart, Edward C. Benzel, Corey C. Ford (1997). Fundamentals of Neuroimaging. W.B. Saunders

Donald L. Schomer and Fernando H. Lopes da Silva (2017). Niedermeyer's Electroencephalography: Basic Principles, Clinical Applications, and Related Fields. Oxford University Press.

Govind B Chavhan (2013). MRI made easy (for Beginners). JP Medical Ltd

Heidi Johansen-Berg Timothy E.J. Behrens (2013). Diffusion MRI. Academic Press.

Hubert Preissl (2005). Magnetoencephalography. Academic Press

Huettel SA, Song AW, McCarthy G (2014). Functional Magnetic Resonance Imaging 3rd Edition. Sinauer Associates, Inc, Sunderland, Massachusetts

Karl Friston Christopher Frith Raymond Dolan Cathy Price Semir Zeki John Ashburner William Penny (2003). Human Brain Function 2nd Edition. Academic Press

Lawrence J. Hirsch, Richard P. Brenner (2010). Atlas of EEG in Critical Care. John Wiley & Sons, Ltd

Michael Gazzaniga, Richard B. Ivry, George R. Mangun (2013). Cognitive Neuroscience: The Biology of the Mind. Wiley.

Peter Hansen, Morten Kringelbach, and Riitta Salmelin (2010). MEG: An Introduction to Methods. Oxford Scholarship Online.

Roberto Cabeza and Alan Kingstone (2006). Handbook of Functional Neuroimaging of Cognition. MIT Press

Ronald L. Van Heertum; Ronald S. Tikofsky; Masanori Ichise (2009). Functional cerebral SPECT and PET imaging. Lippincott Williams & Wilkins

Rosler, Frank (2012). Neuroimaging of human memory: linking cognitive processes to neural systems. Oxford University Press

Steven J. Luck (2005). An Introduction to the Event-Related Potential Technique. MIT Press.

Thoru Yamada and Elizabeth Meng (2018). Practical Guide for Clinical Neurophysiologic Testing, EEG. Wolters Kluwer.

Todd C. Handy (2004). Event-Related potentials: A Methods Handbook. MIT Press

William Penny Karl Friston John Ashburner Stefan Kiebel Thomas Nichols (2006). Statistical Parametric Mapping: The Analysis of Functional Brain Images 1st Edition. Academic Press.

15.4.2 Additional references:

Online website:

- http://www.atlasbrain.com/enx/atlas_main.html
- http://www.intechopen.com/subjects/neuroscience
- www.fil.ion.ucl.uk/spm
- www.fmrib.ox.ac.uk/fsl
- http://healthycampus.usm.my/index.php/en/ (USM website and library)

15.5 Assessment

15.5.1 Assessment Summary

Form of Assessment	Weighting
Assignment (Individual and Group)	30%
Presentation/Seminar (Individual or/ and Group)	20%
Final Examination	50%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark.

16.0 GCN509 Research Project Stage I

16.1 Course Synopsis

16.1.1 Course Statement

This course aims to provide knowledge and should prepare a research proposal that consists of case studies and quantitative research. Students will learn about identifying issues and problems in the field of neuromarketing/neuroeducation/computational neuroscience/ neurobehaviour and others, undertaking a literature review and synthesise previous work, determining the appropriate tools and techniques for collecting and analysis of data and writing up the research proposal. Besides this, the students are exposed to the ethics in research as all experiments involving human being/animals will require Human/Animal Ethics Committee Universiti Sains Malaysia approved before embarking to the next module Research Project Stage II. The candidate will be able to manage cognitive neuroscience studies for the government, private enterprise in numerous fields of cognitive neuroscience.

16.1.2 Course Credit

2 Credit units

16.2 Learning Objectives

Learning outcomes	Students should be able to establish a detailed research plan and methodologist for a research project in the field of cognitive neurosciences
	Students should be able to practice and uphold ethical values in all aspects of research work in the field of cognitive neurosciences
	Students should be able to synthesize data as well as information from various sources towards the individual learning process

16.3 Teaching and Learning Arrangements

This course is taught through quizzes (20%), Assignments and/or weekly reports (20%). Involvement in Planning (5%), Presentation (5%), Research Proposal Report (50%)

16.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

16.4.1 Main references:

Below are the reference textbooks available in the library:

Hasnah Haron, Siti Nabiha Abdul Khalid & Yuvaraj Ganesan (2011). A Handbook for Business Research Methods. Pearson Malaysia.

Saunders, M., Lewis, P., & Thornhill, A. (2012), Research Methods for Business Students, Sixth

Edition, Pearson, UK. (ISBN: 978-0273750758)

Creswell, J.W. (2009), Research Design: Qualitative, Quantitative and Mixed Method Approach, 3rd Edition. Sage Publishing. (ISBN: 978-1412965576)

Tokuhama- Espinosa T. (2011) Mind, brain and education science: A comprehensive guide to the new brain-based teaching, W.W. Norton & Company Inc 500 Fith avenue New York, N. Y. 10110 (ISBN: 978-0393706079)

Sousa David A (Ed). (2010) Mind, brain and education: Implication for the Classroom. Solution T Press, 555 North Morton Street, Bloomington, IN 47404 (ISBN: 978-1935249634)

Weiner B I and Graham R. J (Ed) (2013) Handbook of Psychology: Assessment Psychology Vol 10 John Wiley and Sons Inc. New Jersey (ISBN: 978-0470891278)

Ward J. (2010). The Students Guide toCognitive Neuroscience (Second Edition) Psychology Press. Taylor and Francis Group. Hove and New York. (ISBN: 978-1848720039)

Pattern E. K and Campbell R S (2011) Educational Neuroscience Wiley Blackwell. Maiden MA (ISBN: 978-1119973195)

Virginia Pickel & Menahem Segal (2014). The Synapse: Structure and Function. Academic Press, USA. (ISBN: 9780124186750)

Liana Fattore (2015). Cannabinoids in Neurologic and Mental Disease. Academic Press. (ISBN: 9780124170414)

Gerald E. Schneider (2014). Brain Structure and Its Origins in Development and in Evolution of Behavior and the Mind. The MIT Press. (ISBN: 9780262026734)

Roi Cohen Kadosh (2014). The Stimulated Brain Cognitive Enhancement Using Non-Invasive Brain Stimulation. Academic Press. (ISBN: 9780124047044)

Michael Numan (2015). Neurobiology of Social Behavior Towards an Understanding of the Prosocial and Antisocial Brain. Academic Press (ISBN: 9780124160408)

John E. Mendoza & Anne L. Foundas (2008). Clinical Neuroanatomy: A Neurobehavioral Approach. Springer. (ISBN: 9780387366005)

Carl Faingold & Hal Blumenfeld (2014). Neuronal Networks in Brain Function, CNS Disorder, and Therapeutics. Academic Press. (ISBN: 9780124158047)

George R. Mangun (2014). Cognitive Electrophysiology of Attention Signal of the Mind. Academic Press (ISBN: 9780123984517)

Michael Petrides (2014). Neuroanatomy of Language Regions of the Human Brain.

Academic Press. (ISBN: 9780124055148)

Michael S. Gazzaniga & George R. Mangun (2014). The Cognitive Neurosciences, 5th Edition. The MIT Press (ISBN: 9780262027779)

Michael S. Gazzaniga, Richard B. Ivry & George R. Mangun (2014). Cognitive Neuroscience The Biology of the Mind, 4th Edition. Norton, New York (ISBN: 978-0393913484)

Dale Purves, Roberto Cabeza, Scott A. Huettel, Kevin S. LaBar, Michael L. Platt & Marty G. Waldorff (2013). Principles of Cognitive Neuroscience, 2nd Edition. Sinauer. (ISBN: 978-0878935734)

Bernard J. Baars & Nicole M. Gage (2010). Cognition, Brain, and Consciousness: Introduction to Cognitive Neuroscience, 2nd Edition. Academic Press. (ISBN: 9780123750709)

Bradley R. Postle (2015). Essentials of Cognitive Neuroscience. Wiley-Blackwell. (ISBN: 9781118468067)

Bernard J. Baars & Nicole M. Gage (2012). Fundamentals of Cognitive Neuroscience: A Beginner's Guide, 1st Edition. Academic Press (ISBN: 978-0124158054)

Jamie Ward (2015). The Student's Guide to Cognitive Neuroscience, 3rd Edition. Psychology Press. (ISBN: 978-1848722729)

Shanbao Tong & Nitish V. Thakor (2009). Quantitative EEG Analysis Methods and Clinical Applications. Artech House, London (ISBN: 978-1596932043)

Robert Snowden, Peter Thompson & Troscianko (2011). Basic Vision: An Introduction to Visual Perception, Revised Edition. Oxford. (ISBN: 978-0199572021)

16.4.2 Additional Resources

Bryman, A. & Bell, E. (2011). Business Research Methods, 3rd ed. New York: Oxford University Press, Inc. (ISBN: 978-0199583409)

Cooper, R & D & Schindler, S.P (2003). Business Research Methods. Boston: Irwin McGraw Hill.

Ellet, W. (2007) The Case Study Handbook, 12th Ed. Harvard Business School Press: Boston (ISBN: 978-0073521503)

Eishenhardt, K. M (2002) Building Theories from Case Study Research, in A.M. Huberman and M.B

Miles, eds. The Qualitative Researcher's Companion, Thousand Oaks, CA: Sage Publications, pp 5-35 (ISBN: 978-07619119113)

List of Journal:

- *Trends in Neuroscience and Education*
- *The Journal of Neuroscience and Cognition Neuroscience and Cognition*
- *Educational Neuroscience*
- *Developmental Cognitive Neuroscience*
- *Journal of Cognitive Neuroscience*

16.5 Assessment

16.5.1 Assessment Summary

Form of Assessment	Weighting
Quiz	20%
Assignment	20%
Planning and involvement in tasks	5%
Presentation	5%
Research Proposal	50%

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark.

16.6 Additional information:

16.6.1 Research Project Activities and Location

The classes for GCN509 Research Project Stage I are conducted at USM@KL or via online Webex, depending on the topic. However, the research proposal presentations are conducted at USM Health Campus. Any changes will be updated from time to time.

Students must use at least one neurotechnology or cognitive science tool for their research project in human study. For animal study, students must conduct a research project related to cognitive functions, such as learning and memory, or any other relevant topic.

Students can propose their own research topics, but they need to submit the proposal to the program level for evaluation. Subsequently, they will be called for a presentation to assess suitability and relevance. Students must submit their proposals to the program level (neurokognitif@usm.my) at least **four months** (by December) before the offered semester of GCN509 for processing. Alternatively, students can choose from any advertised topics by the lecturer, which will be shared approximately **three months** (by January) before the offered semester. Please note that the dates are subject to change, and updates will be provided as necessary.

Below are the locations and research facilities for your reference. The location depends on the chosen research topic and the research equipment required. Full-time students registered for the October intake are advised to enroll in GCN509 during their second semester, while those in the March intake are recommended to register for GCN509 during their third semester.

- USM@KL
    - EGG room – the EEG must rent from company
- USM Health Campus, Kelantan
    - workshops, presentations, assessments
    - human studies: EEG, fMRI (3.0 Tesla), Eye-tracking, others;
    - Animal studies: learning, memory, cognitive functions, behaviour
- USM Main Campus, Penang
    - human studies: EEG, Eye-tracking – must rent from the company
    - Animal studies: learning, memory, cognitive functions, behaviour
- USM IPPT Bertam, Penang
    - fMRI (1.5 Tesla)

During GCN509, students are expected to complete their research proposals and necessary forms and submit them for evaluation and human/animal ethical approval. The research proposals should be submitted for evaluation **five weeks** before the proposal presentation for assessment. Additionally, students must submit the complete documents for human/animal ethics approval **two weeks** after the proposal presentation, updating their research proposals according to the comments given by the examiners. Students are required to apply and submit their applications to the Human Research Ethics Committee USM (JEPeM) or USM Institutional Animal Care and Use Committee (JKPPH). Please note that the submission dates are subject to change and will be updated from time

to time by the course coordinator. Below are the instructions and information that students need to follow:

1. **For Human Research Ethics Applications:**

    - Students must fill in and complete the initial submission forms and the Hospital USM form (if applicable).
    - The form can be downloaded from JEPeM's website and submitted online.
    - For inquiries about the application form, the process, status, etc., please email Cik Abdah Khariah (Secretariat JEPeM) at ab.khairiah@usm.my, or contact other secretariats listed in the website.
    - To obtain the required signatures from HOD/Dean/Hospital Director, email Cik Nurul at neurosciencespa@yahoo.com.
    - The completed application form must be submitted to the JEPeM website and uploaded to the eLearning portal before the study week/exam week.

2. **For Animal Research Ethics Application:**

    - Students can download the form from JKPPH's website.
    - For advice on the procedure, students may contact your supervisor and Pn. Siti Nurshazwani (Secretary JKPPH) at jkpph@usm.my.
    - The completed application form must be submitted to JKPPH and the eLearning portal before the study week/exam week.

3. **Important Note:**

    - Any sudden changes to your research title, objectives, methodology, consent form, etc. after submission to the Human Research Ethics Committee USM (JEPeM) or USM Institutional Animal Care and Use Committee (JKPPH) will not be entertained and may cause severe delays in ethics approval, leading to delays in data collection during Research Project Stage II.
    - If you have any changes after the submission of the proposal for human/animal ethics approval, you are advised to submit the 'Study Protocol Amendment Submission Form' for additional approval right after receiving the ethical approval from the committee.
    - Students are advised to contact the human/animal ethics committee to inquire whether they have received your submission within seven working days after submission. Additionally, Students are advised to contact the human/animal ethics committee to get an update about the application every 3 weeks.

4. **General Advice:**

- All submission documents must be checked and approved by your supervisory team members. Ensure early submission to allow time for feedback, corrections, or amendments.
- Students are advised to update their progress with supervisors weekly or at least twice a month.

17.0 GCN510 Computational Neurosciences and Neuroinformatics

17.1 Course Synopsis

17.1.1 Course Statement

This elective course serves as an introduction, providing a foundational understanding of basic computational methods essential for comprehending the nervous system and its functions. The curriculum explores into the computational principles that govern critical aspects of vision, sensory-motor control, learning, and memory. Topics covered include the representation of information by spiking neurons, processing information in neural networks, and algorithms for adaptation and learning. Throughout the course, hands-on exercises and demonstrations using Matlab aim to deepen students' comprehension of the introduced concepts and methods. By the course's conclusion, participants will have acquired valuable insights into the computational underpinnings of neural processes

17.1.2 Course Credit

4 Credit units

17.2 Learning Objectives

Learning outcomes	Students should be able to explain the brain principle and neural network system.
	Students should be able to adapt the computational brain neural system into decision making.
	Students should be able to demonstrate the ability to use brain modelling methods into application.

17.3 Teaching and Learning Arrangements

This course is taught through lectures, tutorials, and seminar.

17.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

17.4.1 Main references:

Below are the reference textbooks available at the libraries:

"Dynamical System in Neuroscience: The Geometry of Excitability and Burdting", Izhikevich, E. M., Cambridge, MA, MIT Press, (2007) (ISBN: 9780262090438)

"Theoretical Neuroscience: Computational and Mathematical Modeling of Neural System", Peter Dayan and Larry Abbot, MIT Press, Cambridge, (2001) (ISBN: 9780262041997)

"Matlab Primer", Kermit Sigmon, 2nd Edition, University of Florida

Arbib, M.A. and Grethe, J.S. (2012). Computing the Brain: A Guide to Neuroinformatics. Academic Press. ISBN: 978-0123885432

Koslow, S.H. and Subramaniam, S. (2005). Databasing the Brain: From Data to Knowledge (Neuroinformatics). Wiley. ISBN: 9780471309215

Crasto, C.J. and Koslow, S.H. (2007). Neuroinformatics (Methods in Molecular Biology). Springer. ISBN: 978-1588297204

Vinoth, J. (2009). Neuroinformatics for Neuropsychology. Springer. ISBN: 9781441900593

Ascoli, G., Schutter, E.D., Kennedy, D.N. (2017). Neuroinformatics. Springer. ISSN: 1539-2791

Cheng, X., Weinberger, D.R., Marcus, D., Horn, J.V., Mattay, V.S., Luo, Q. (2015). Recent Advances and the Future Generation of Neuroinformatics Infrastructure. Frontiers Media SA. ISBN: 9782889196777

Cortes, J.M., Marinazzo, D., Munoz, M.A. (2015). Information-based methods for neuroimaging: Analyzing structure, function and dynamics. Frontiers Media SA. ISBN: 9782889195022

17.6.2 Additional references:

Neuroinformatics: www.incf.org

Neuroscience Information Framework portal: https://neuinfo.org/

Neurolex neuroscience ontology https://scicrunch.org/scicrunch/interlex/dashboard

Neurodata Without Borders format: https://www.nwb.org/

Neuroimaging Data Model http://nidm.nidash.org/

Brain Imaging Data Structure format http://bids.neuroimaging.io/

NeuronDB data repository: https://senselab.med.yale.edu/neurondb

NineML neuron description language: http://incf.github.io/nineml-spec/

PyNN neuron modeling language http://neuralensemble.org/PyNN/

Neuron neuronal network simulator: https://www.neuron.yale.edu/neuron/

NEST neuronal network simulator http://www.nest-simulator.org/

Pype9 neuronal ensemble simulator pipeline: https://github.com/NeuralEnsemble/pype9

17.5 Assessment

17.5.1 Assessment Summary

Form of Assessment	Weighting
Assignment	30%
Test	30%
Final examination	40%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark

18.0 GCN511 Genetics in Cognitive Neuroscience

18.1 Course Synopsis

18.1.1 Course Statement

Cognitive neurosciences rely on multidisciplinary backgrounds which include the importance of genetic information to understand the various biological and molecular aspects of the conditions. Therefore, having genetic modules in the course is a relevant approach for a diverse understanding and elucidating mechanism of cognition and brain function. Ethical aspects of the use of genetic information in research will be emphasized throughout the course. At the end of the course, students should be able to relate the influence of specific genetic variants on cognition, effective regulation and central nervous system of normal and disorders.

18.1.2 Course Credit

4 Credit units

18.2 Learning Objectives

Learning outcomes	1.	Students should be able to demonstrate an understanding of the genetic component and principles in the biology of the cell.
	2.	Students should be able to use the knowledge and understanding of the genetics principles and translation of the information into the expression of cognitive behaviour in normal and disorders.
	3.	Students should be able to integrate knowledge in molecular and cellular genetics to design approaches towards neurocognitive experiments

18.3 Teaching and Learning Arrangements

This course is taught through lectures which incorporate tutorials, practical, seminars, case discussions and literature review.

18.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

18.4.1 Main references:

Below are the reference textbooks:

Goldberg, Terry E., Weinberger, Daniel R.: The Genetics of Cognitive Neuroscience
ISBN: 978-81-203-4299-6

Robert J. Brooker: Genetics Analysis & Principles
ISBN: 978-0-07-111098-3

Bradley R. Postle. (2015). Essentials of Cognitive Neuroscience. WILEY Blackwell

Jamie Ward. (2015). The Students' Guide to Cognitive Neuroscience. 3rd Edition. Psychology Press

Baars J. B. & Gage N. M. (2013). Fundamentals of Cognitive Neuroscience: A Beginner's

Guide. Academic Press, Elsevier

Baars J. B. & Gage N. M. (2010). Cognition, Brain, and Conciousness: Introduction to Cognitive Neuroscience. Elsevier

Gazzaniga M. S., Ivry R. B. & Mangun G. R. (2014). Cognitive Neuroscience: The Biology of the Mind. 4th Edition. W.W. Norton & Company

Purves D, Cabeza R., Huettle S. A., LaBar K. S., Platt M. L. & Wolforff M. G. (2013). Principles of Cognitive Neuroscience. 2nd Edition. Sinauer Associates Publisher

18.4.2 Additional references:

Online Resources

USM website and library: http://healthycampus.usm.my/index.php/en/

18.5 Assessment

18.5.1 Assessment Summary

Form of Assessment	Weighting
Tutorial	20%
Assignments	20%
Final Examination	60%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.

Assessments not submitted officially will not be graded and will receive a zero mark.

All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark

19.0 GCN512 Testing and Assessment in Cognitive Neuroscience

19.1 Course Synopsis

19.1.1 Course Statement

This elective course aims to introduce testing and assessment in cognitive neuroscience to students who intend to specialise further in advanced neuropsychology at the doctorate level. This course is important because acquired knowledge in this field would be applied in daily practice as well as in research as a cognitive neuroscientist, clinical psychologist and clinical neuropsychologist.

19.1.2 Course Credit

4 Credit units

19.2 Learning Objectives

Learning outcomes	1.	Students should be able to develop knowledge of the testing and assessment in cognitive neuroscience
	2.	Students should be able to demonstrate the basic techniques in the various domains of Cognitive Functioning/Neuropsychological Assessments
	3.	Students should be able to report the experimental finding according to the standard procedure

19.3 Teaching and Learning Arrangements

This course is taught through lectures which incorporate tutorials, practical, seminars, case discussions and literature review.

19.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

19.4.1 Main references

Joel E.Morgan and Joseph E. Ricker. Textbook of Clinical Neuropsychology, (2008)

Dale Purves et al, Principles of Cognitive Neuroscience, (2008)

Michael Gazzaniga, Richard B. Ivry, George R. Mangun: Cognitive Neuroscience: The Biology of the Mind (Third Edition)

Jamie Ward, The Student's guide to Cognitive Neuroscience, (2010)

Gary Groth-Marnat, Handbook of Psychological Assessment, (2009)

E. Bruce Goldstein, Cognitive Psychology, 3rd Edition, (2011).

19.4.2 Additional References

Online website:
https://www.cogneurosociety.org
http://ccn.ucla.edu/wiki
http://www.apa.org/action/science/index.aspx
https://www.minded.org.uk/
https://www.nimh.nih.gov

https://neuroeconomics.org/
https://www.nature.com/subjects/cognitive-neuroscience

19.5 Assessment

19.5.1 Assessment Summary

Form of Assessment	Weighting
Tutorial	20%
Seminar (Group discussion)	10%
Assignments (Journal Club)	13%
Practical	7%
Final Examination	50%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark.

20.0 GCN513 Cognitive Neurolinguistics

20.1 Course Synopsis

20.1.1 Course Statement

This elective course aims to introduce cognitive neurolinguistics to students who intend to specialise further in advanced neuro-psycholinguistics at the doctorate level. This course is important because acquired knowledge in this field would be applied in daily practice as well as in research as a cognitive neuroscientist and clinical psycholinguist.

20.1.2 Course Credit

4 Credit units

20.2 Learning Objectives

Learning outcomes	1.	Students should be able to differentiate the cognitive function of language and processing.
	2.	Students should be able to demonstrate the ability to analyse language impairment.
	3.	Students should be able to present the research project of speech disorder using the recent technology
	4.	Students should be able to manage and organise group work.

20.3 Teaching and Learning Arrangements

This course is taught through lectures which incorporate tutorials, practical, seminars, case discussions and literature review.

20.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

20.4.1 Main references:

Below are the reference textbooks available at the libraries:

Ahlsen, Elizabeth, (2006), Introduction to Neurolinguistics, John Benjamins Publishing Company.

Berko-Gleason, Jean, Ratner, Nan Bernstein, (1998), Psycholinguistics 2nd Ed. Boston University, USA, University of Maryland, College Park, USA, Harcourt Publishers Ltd, a subsidiary of Harcourt International Ltd., London.

Berko-Gleason, Jean, Ratner, Nan Bernstein, (2012), The Development of Language (8th Edition) (The Allyn & Bacon Communication Sciences and Disorders Series), Allyn & Bacon Inc.

Ingram, John C. L., (2007), Neurolinguistics: An Introduction to Spoken Language Processing And Its Disorders, Cambridge University Press.

20.4.2 Additional references:

Online Resources

For online resources for cognitive neurolinguistics, the websites are listed below:

https://www.linguisticsociety.org/resource/neurolinguistics
https://www.sciencedirect.com/topics/neuroscience/neurolinguistics
https://www.britannica.com/science/neurolinguistics
https://www.cambridge.org/core/browse-subjects/language-and-linguistics/psycholinguistics-and-neurolinguistics

20.5 Assessment

20.5.1 Assessment Summary

Form of Assessment	Weighting
Presentation	20%
Project	40%
Final Examination	40%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.

Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark.

21.0 GCN514 Perception and Attention Control

21.1 Course Overview

21.1.1 Course Statement

This course intends to introduce to students of various backgrounds on the basic and applied neuroscience association with consciousness, sleep, perception and attention. These four elements are important in cognitive neurosciences where the understanding of psychology is important. Students will need to understand these via lectures, tutorials and assignments.

21.1.2 Course Credit

4 Credit units

21.2 Learning Objectives

Learning outcomes	1.	Students should be able to differentiate the differences of fundamental concepts of cognitive and perception
	2.	Students should be able to explain attention control in health psychology and psychopathology
	3.	Students should be able to report case study through presentation

21.3 Teaching and Learning Arrangements

This course is taught through interactive lecture session which incorporates lecture, class discussion, and presentation.

21.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

21.4.1 Main references

Below are the reference textbooks available at the libraries:

Bradley R. Postle, (2015). Essentials of Cognitive Neuroscience. Wiley Blackwell (ISBN:9781118468067).

Jamie Ward, (2015). The Students' Guide to Cognitive Neuroscience, 3rd Edition. Psychology Press (ISBN: 978-1848722729)

Baars, J. B. & Cage, N. M.,(2013). Fundamentals of Cognitive Neuroscience: A Beginner's Guide. Academic Press, Elsevier (ISBN: 9780124158054)

Baars, J. B. & Cage, N. M., (2010). Cognition, Brain and onscious ness: Introduction to Cognitive Neuroscience. Elsevier (ISBN: 9780123750709)

Gazzaniga, M. S., Ivry, R. B. & Mangun, G. R., (2014). Cognitive Neuroscience: The Biology of the Mind. 4th Edition. W.W. Norton & Company (ISBN: 978 -0393913484).

Purves, D., Cabeza, R., Huettle, S. A., LaBar, K. S., Platt, M. L. & Wolforff, M. G.,(2013). Principles of Cognitive Neuroscience. 2 nd Edition. Sinauer Associates Publisher (ISBN: 978-0878935734).

21.4.2 Additional references

www.journals.elsevier.com/consciousness-and-cognition

www.mitpressjournals.org/loi/jocn

https://www.ncbi.nlm.nih.gov/labs/journals/perception

www.journals.elsevier.com/cognitive-psychology/

21.5 Assessment

21.5.1 Assessment Summary

Form of Assessment	Weighting
Quizzes	5%
Assignment	10%
Test	5%
Practicum	20%
Final Exam	60%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.

Assessments not submitted officially will not be graded and will receive a zero mark.

All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark.

22.0 GCN515 Plasticity and Memory

22.1 Course Synopsis

22.1.1 Course Statement

This elective course aims to introduce about plasticity and memory to students who intend to specialise further in advance neuropsychology at the doctorate level. This course is important because acquired knowledge in this field would be applied in daily practice as well as in research as a cognitive neuroscientist, clinical psychologist and clinical neuropsychologist.

22.1.2 Course Credit

4 Credit units

22.2 Learning Objectives

Learning outcomes	1.	Students should be able to develop knowledge of plasticity and memory of human brain
	2.	Students should be able to illustrate the process of plasticity using multimedia technology at various level
	3.	Students should be able to evaluate the plasticity on memory within valid evidence

22.3 Teaching and Learning Arrangements

This course is taught through lectures which incorporate tutorials, seminars, discussions and literature review.

22.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

22.4.1 Main references

Eric R. Kandel (Author), James H. Schwartz (Author), Thomas M. Jessell (Author): Principles of Neural Science, Fifth Edition

Michael Gazzaniga, George R. Mangun (Chief Editors): Cognitive Neuroscience: The Biology of the Mind (5th Edition)

Lary R. Square et al, Fundamental Neuroscience (4th edition)

Dale Purves et al, Principles of Cognitive Neuroscience, 2008

Jamie Ward, The student's guide to Cognitive Neuroscience, 2nd edition

Neural plasticity and memory: from genes to brain imaging / [edited by] Federico

Bermudez-Rattoni, 2007.

22.4.2 Additional references

https://www.ncbi.nlm.nih.gov/books/NBK1850/
http://www.brainfacts.org/thinking-sensing-and-behaving/learning-and-memory
https://nba.uth.tmc.edu/neuroscience
https://videocast.nih.gov
https://www.ucl.ac.uk/pals/research/experimental-psychology/theme/learning-memory/

22.5 Assessment

22.5.1 Assessment Summary

Form of Assessment	Weighting
Tutorial	7%
Seminar & Group discussion	20%
Assignment (Journal Club)	23%
Final examination	50%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark.

23.0 GCN516 Brain and Learning

23.1 Course Synopsis

23.1.1 Course Statement

The aim of this elective course is to introduce knowledge and research findings from neuroscience to be integrated into educational practices.

23.1.2 Course Credit

4 Credit units

23.2 Learning Objectives

Learning outcomes	1.	Students should be able to apply neuroscience knowledge in the aspects of teaching and learning and educational research
	2.	Students should be able to differentiate various needs of education based on neuroscience knowledge specifically in teaching and learning aspects
	3.	Students should be able to make a clear report, review and analysing research findings in the field of neuroscience in educational context with confidence in the form of oral presentation and writing

23.3 Teaching and Learning Arrangements

This course is taught through lectures which incorporate tutorials, practical, seminars, case discussions and literature review.

23.4 Learning Resources

Students can access learning materials mainly journals and textbooks from libraries which are at USM Kuala Lumpur Campus, USM Health Campus, and USM main campus Penang.

23.4.1 Main references

Atherton, M. (2005). Applying the Neurosciences to Educational Research: Can Cognitive Neuroscience Bridge the Gap? Part I. Retrieved 17 Dec 2015 from http://www.tc.umn.edu/~athe0007/papers/EducationandNeuroscience.pdf

Fein A D. (Ed) (2011). The Neuropsychology of Autism. Oxford: University Press

Gazzaniga, M.S., Ivry, R.B. & Margun, G.R. (2014). Cognitive neuroscience: The biology of the mind. USA: W.W. Norton & Company Inc.

Guy, R., & Byrne B. (2013). Neuroscience and Learning: Implications for Teaching Practices. Journal of Experimental Neuroscience, 7, 39-42.

23.4.2 Additional references

Henry L. (2012). The Development of Working Memory in Children. London: Sage Publication Ltd.

Mareschal, D., Butterworth, B., & Tolmie, A. (Eds.) (2013). Educational Neuroscience. Oxford: Wiley-

Blackwell. (ISBN: 978-1-118-72589-4)

Purdy, N., & Morrison, H. (2009). Cognitive Neuroscience and Education: Unravelling the confusion, Oxford Review of Education, 35(1), 99-109.

23.5 Assessment

23.5.1 Assessment Summary

Form of Assessment	Weighting
Assignments (Coursework)	50%
Quiz/Test	20%
Pembentangan	30%
TOTAL	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark.

24.0 Comparative Cognitive Neuroscience (GCN 517)

24.1 Course Synopsis

24.1.1 Course Statement

Comparative cognitive neuroscience course motivates the students to learn how to assess animal cognition and behaviours and data analysis. The course will begin with animal brain anatomy and build to understand the structures and their specific function in various behaviours such as cognitive (learning and memory), emotional (fear and anxiety) and locomotion (motor/movement) behaviour etc. To analyse the above-mentioned behaviours, several animal behaviour instruments such as Morris water maze, radial arm maze, T-maze, Y-maze, elevated plus maze, shuttle box, open filed test, actimeter, Rotarod, hot/cold plate and IntelliCage are to be used. Finally, the course will teach how to assess the behaviours of both vertebrate's and non-vertebrates such as rodent's models. Besides, the course will provide facilities to analyse behaviour data using specific statistical methods and basic histological techniques to understand staining procedures in brain slices and evaluate under a microscope. In brief, this course will help to understand animal behaviour assessment, data analysis, staining methods and usage of the microscope.

24.1.2 Course Credit

4 Credit Units

24.2 Learning Objectives

Learning outcomes	1.	The student should be able to differentiate human and animal brain of cognitive function assessment
	2.	The student should be able to demonstrate a computational model of human and animal cognitive function to validate existing data
	3.	The student should be able to compare various statistical methods to analyse human and animal behaviour data based on valid evidence
	4.	The student should be able to demonstrate and initiate a career in marketing and research in neuroscience

24.3 Teaching and Learning Arrangements

This course is taught through lectures which incorporate tutorials, practical, seminars, case discussions and literature review.

24.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

24.4.1 Main references

Below are the reference textbooks available at the libraries:

Comparative Vertebrate Neuroanatomy: Evolution and Adaptation by Ann B. Butler and William Hodos.

Principles of Brain Evolution by George F Striedter.

Cognitive Neuroscience by Michael Gazzaniga and Richard B lvry.

Fundamentals of Computational Neuroscience by Thomas Trappenberg

Methods of Behaviour Analysis in Neuroscience. 2nd Edition. Edited by Jerry J. Buccafusco. CRC Press ISBN 978-1-4200-5234

Paxinos and Franklin's the Mouse brain in Stereotaxic Coordinates.

Atlas of Human Central Nervous System Development by Shirley A. Bayer & Joseph Altman, CRC Press

24.5 Assessment

24.5.1 Assessment Summary

Form of Assessment	Weighting
Tutorial	10%
Practical	10%
Assignment	5%
Presentation	5%
Final examination	70%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark.

25.0 GCN518 Introduction to Neuromarketing and Consumer Behaviour

25.1 Course Synopsis

25.1.1 Course Statement

This course is crucial for those who are undertaking Master of Cognitive Neuroscience. It provides the foundation and introduction to understand the principles, theories, concepts, interpretation and issues in Neuromarketing and consumers. Students will be exposed to understand Neuromarketing concerning customer needs and want including industry response towards the application of Neuromarketing elements in the business world. This course is important to ensure the success of marketing strategy. Thus, the course is designed to include customers, marketing and neuro to facilitate students in the application for the business world.

25.1.2 Course Credit

4 Credit units

25.2 Learning Objectives

Learning outcomes	1.	The student should be able to differentiate neuromarketing approaches to current global business situations
	2.	The student should be able to manage the latest practical and technical tools in neuro-marketing to be applied in complex business proposals
	3.	The student should be able to integrate neuromarketing based on social attitudes and social agendas
	4.	The student should be able to demonstrate the implications of ethics, legal, social and policy of neuromarketing through seminars

25.3 Teaching and Learning Arrangements

In recent decades, research in the field of neuroscience has spilled into the national media on a daily basis, suggesting new interventions and applications in social domains such as law, education, and economics, and challenging us to redefine our understandings of responsibility, choice and what it is to be human.

This course will introduce you to the multidisciplinary field of consumer neuroscience and neuromarketing. It will go through to the basic concepts of the human brain, the elements of the consumer mind, how it is studied, and how its insights can be applied in commercial and societal understandings of consumer behaviours.

In this class, we will think critically about the relations between neuromarketing and consumer. What are the ethical, legal, social, and policy implications of emerging neuromarketing? How does neuromarketing reflect consumer attitudes and agendas, and how, in turn, does it reshape those attitudes and agendas?

Students are expected to attend class, read assigned materials carefully and thoughtfully, and participate in case discussion. This course, the emphasis is placed on oral and written communication.

25.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

25.4.1 Main references

Dr. Thomas Zoega Ramsoy. 2014. Introduction to Neuromarketing & Consumer Neuroscience, Neurons Inc ApS. 1st Ed. (ISBN: 978-8799760206)

Stephen J. Genco, Andrew P. Pohlmann. (2013). Neuromarketing for Dummies. John Wiley & Sons Canada, Ltd. 1st Ed. (ISBN: 978-1118518588)

25.4.2 Additional references

Dooley, R. Brainfluence 100 Ways to Persuade and Convince consumers with neuromarketing, John Wiley & Sons, Inc (ISBN: 978-1501264283)

Kotler, P. and Keller, K. L. (2012). Marketing Management. 14th Edition. Upper Saddle River: Pearson Prentice Hall.

Mullins, J.W. and Walker, Jr, O.C. (2012). Marketing Management: A Strategic Decision Making Approach, 8th edition, Singapore: McGraw-Hill Education (Asia).

Kim, W.C. and Mauborgne, R. (2005). Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant, US: Harvard Business School Publishing

25.5 Assessment

25.5.1 Assessment Summary

Form of Assessment	Weighting
Quiz	10%
Project Paper	15%
Discussion	35%
Final examination	40%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero marks.

26.0 GCN519 Research Project Stage II

26.1 Course Synopsis

Student has to pass Research project stage I to proceed research project stage II and submitted for human/animal ethics approval.

26.1.1 Course Statement

The research is now approved by the relevant Human or Animal Ethics Committee USM based on the cognitive neuroscience experiment that will be done during Research Project II period. The student will be placed in a laboratory to equip them with theory and practical aspects of instrumentation and appropriate technical tools. The student will exhibit skills to use technical and non-technical tools, running the experiment ethically in their respective cognitive neuroscience lab followed by data gathering, analysis and report. The student must be able to present their research progress every two weeks via weekly report, presentation to their respective supervisor or co-supervisor or Research Project Stage II coordinator.

26.1.2 Course Credit

4 Credit units

26.2 Learning Objectives

Learning outcomes	1.	Students should be able to perform research activities following a planned schedule
	2.	Students should be able to manage research support groups using technology
	3.	Students should be able to uphold ethical values during research work
	4.	Students should be able to manage and synthesise data from various sources towards self-learning
	5.	Students should be able to defend research findings via experiment using neurotechnology

26.3 Teaching and Learning Arrangements

This course is taught through face to face contact, practical exposure and training, quizzes, journal, statistical analysis presentation and progress report presentation, self study and lab works and daily lab attendance, continuous assessment.

26.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

26.4.1 Main references

Hasnah Haron, Siti Nabiha Abdul Khalid & Yuvaraj Ganesan (2011). A Handbook for Business Research Methods. Pearson Malaysia.

Saunders, M., Lewis, P., & Thornhill, A. (2012), Research Methods for Business Students, Sixth Edition, Pearson, UK. (ISBN: 978-0273750758)

Creswell, J.W. (2009), Research Design: Qualitative, Quantitative and Mixed Method Approach, 3rd Edition. Sage Publishing. (ISBN: 978-1412965576)

Tokuhama- Espinosa T. (2011_ Mind, brain and education science : A comprehensive guide to the new brain-based teaching, W.W. Norton & Company Inc 500 Fifth avenue New York, N. Y. 10110 (ISBN: 978-0393706079)

Sousa David A (Ed). (2010) Mind, brain and education: Implication for the Classroom. Solution T Press, 555 North Morton Street, Bloomington, IN 47404 (ISBN: 978-1935249634)

Weiner B I and Graham R. J (Ed) (2013) Handbook of Psychology: Assessment Psychology Vol 10 John Wiley and Sons Inc. New Jersey (ISBN: 978-0470891278)

Ward J. (2010). The Students Guide to Cognitive Neuroscience (second Edition) Psychology Press. Taylor and Francis Group. Hove and New York. (ISBN: 978-1848720039)

Pattern E. K and Campbell R S (2011) Educational Neuroscience Wiley Blackwell. Maiden MA (ISBN: 978-1119973195)

Virginia Pickel & Menahem Segal (2014). The Synapse: Structure and Function. Academic Press, USA. (ISBN: 9780124186750)

Liana Fattore (2015). Cannabinoids in Neurologic and Mental Disease. Academic Press. (ISBN: 9780124170414)

Gerald E. Schneider (2014). Brain Structure and Its Origins in Development and in Evolution of Behavior and the Mind. The MIT Press. (ISBN: 9780262026734)

Roi Cohen Kadosh (2014). The Stimulated Brain Cognitive Enhancement Using Non- Invasive Brain Stimulation. Academic Press. (ISBN: 9780124047044)

Michael Numan (2015). Neurobiology of Social Behavior Towards an Understanding of the Prosocial and Antisocial Brain. Academic Press (ISBN: 9780124160408)

John E. Mendoza & Anne L. Foundas (2008). Clinical Neuroanatomy: A Neurobehavioral Approach. Springer. (ISBN: 9780387366005)

Carl Faingold & Hal Blumenfeld (2014). Neuronal Networks in Brain Function, CNS Disorder, and Therapeutics. Academic Press. (ISBN: 9780124158047)

George R. Mangun (2014). Cognitive Electrophysiology of Attention Signal of the Mind. Academic Press (ISBN: 9780123984517)

Michael Petrides (2014). Neuroanatomy of Language Regions of the Human Brain. Academic Press. (ISBN: 9780124055148)

Michael S. Gazzaniga & George R. Mangun (2014). The Cognitive Neurosciences, 5th Edition. The MIT Press (ISBN: 9780262027779)

Michael S. Gazzaniga, Richard B. Ivry & George R. Mangun (2014). Cognitive Neuroscience The Biology of the Mind, 4th Edition. Norton, New York (ISBN: 978-0393913484)

Dale Purves, Roberto Cabeza, Scott A. Huettel, Kevin S. LaBar, Michael L. Platt & Marty G. Waldorff (2013). Principles of Cognitive Neuroscience, 2nd Edition. Sinauer. (ISBN: 978-0878935734)

Bernard J. Baars & Nicole M. Gage (2010). Cognition, Brain, and Consciousness: Introduction to Cognitive Neuroscience, 2nd Edition. Academic Press. (ISBN:9780123750709)

Bradley R. Postle (2015). Essentials of Cognitive Neuroscience. Wiley-Blackwell. (ISBN: 9781118468067)

Bernard J. Baars & Nicole M. Gage (2012). Fundamentals of Cognitive Neuroscience: A Beginner's Guide, 1st Edition. Academic Press (ISBN: 978-0124158054)

Jamie Ward (2015). The Student's Guide to Cognitive Neuroscience, 3rd Edition. Psychology Press. (ISBN: 978-1848722729)

Shanbao Tong & Nitish V. Thakor (2009). Quantitative EEG Analysis Methods and Clinical Applications. Artech House, London (ISBN: 978-1596932043)

Robert Snowden, Peter Thompson & Troscianko (2011). Basic Vision: An Introduction to Visual Perception, Revised Edition. Oxford. (ISBN: 978-0199572021)

26.4.2 Additional Resources

Bryman, A. & Bell, E. (2011). Business Research Methods, 3rd ed. New York: Oxford University Press, Inc. (ISBN: 978-0199583409)

Cooper, R & D & Schindler, S.P (2003). Business Research Methods. Boston: Irwin McGraw Hill.

Ellet, W. (2007) The Case Study Handbook, 12th Ed. Harvard Business School Press: Boston (ISBN: 978-0073521503)

Eishenhardt, K. M (2002) Building Theories from Case Study Research, in A.M.Huberman and M.B

Miles, eds. The Qualitative Researcher’s Companion, Thousand Oaks, CA: Sage Publications, pp 5-35 (ISBN: 978-07619119113)

Journals:

Trends in Neuroscience and Education
The Journal of Neuroscience and Cognition Neuroscience and Cognition
Educational Neuroscience
Developmental Cognitive Neuroscience
Journal of Cognitive Neuroscience
Other related journal

26.5 Assessment

26.5.1 Assessment Summary

Form of Assessment	Weighting
Quiz	5%
Practical training/Lab work	20%
Practical/Laboratory report	10%
Assignment (e.g., critical analysis of journal publication and/or scoping review)	15%
Presentation (critical analysis of journal publication and/or Progress report)	50%

All assessment tasks must be passed to obtain a final grade in this course.

Assessments not submitted officially will not be graded and will receive a zero mark.

All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark.

26.6 Additional information

For GCN519 Research Project Stage II, workshops/classes and assessments are conducted at USM Health Campus, Kelantan, while data preparation and collection take place at the experiment location. For working students, please ensure to take leave to attend workshops/classes and assessments. Any changes will be updated from time to time.

During this stage, students must ensure that they have obtained human/animal ethics approval. It is advisable for students to contact the human/animal ethics committee to receive updates about their applications every **2-3 weeks**. Additionally, students need to complete and submit bench fee documents necessary for materials and methods. Students can commence pilot data collection and real data collection once they have received the human/animal ethical approval. While waiting for approval, students can begin preparing for the experiment, including protocol and paradigm design, training for data collection, and planning for analysis and interpretation. Furthermore, students are expected to initiate data preparation, protocol, and paradigm design, along with commencing data collection. They are also expected to complete the analysis with the already collected data. Please regularly meet with your supervisory team members to ensure smooth experiments, analysis, and interpretations.

Students should submit the progress report and submission documents for evaluation **five weeks** before the progress presentation. Furthermore, students are expected to update the progress report with recent findings, citations, amendments as per feedback and suggestions from human/animal ethical committee members, results and discussion, as well as feedback and suggestions from supervisory team members. Students also need to update the achieved milestones in the results section. For those who do not have pilot data or real data yet, you are expected to write expected results with proper tables and figures, as well as an expected discussion based on the anticipated results. Please note that submission dates are subject to change and will be updated from time to time by the course coordinator.

All submission documents must be checked and approved by your supervisory team members. Ensure early submission to allow time for feedback, corrections, or amendments. Students are advised to update their progress with supervisors weekly or at least twice a month.

27.0 GCN520 Research Project Stage III

27.1 Course Synopsis

Student has to pass Research project stage II and received human/animal ethical approval to proceed research project stage III

27.1.1 Course Statement

The student at this stage of Research Project III is required to demonstrate manipulative skills in utilising technical tools which involve data collection, data analysis, data synthesis. Finally, the student is expected a research report following a systemic and scientific report format. The student will synthesise the research into a manuscript which will be discriminated in a seminar. The students will receive critical reviews during the seminar and refine their manuscripts so a publishable manuscript that is ready will be prepared.

27.1.2 Unit of Course

4 Credit units

27.2 Learning Objectives

Learning outcomes	1.	Students should be able to perform research activities follow a planned schedule
	2.	Students should be able to practice ethical values during research undertaking
	3.	Students should be able to synthesise information from various sources towards self-learning
	4.	Students should be able to defend research findings via experiment that using neurotechnology

27.3 Teaching and Learning Arrangements

The student will be taught via face to face learning, workshops, continuous supervision, presentation of research data on vertical poster writing workshop followed by a research report presentation before the viva and article assessment.

27.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

27.4.1 Main references

Hasnah Haron, Siti Nabiha Abdul Khalid & Yuvaraj Ganesan (2011). A Handbook for Business Research
Methods. Pearson Malaysia.

Saunders, M., Lewis, P., & Thornhill, A. (2012), Research Methods for Business Students, Sixth Edition, Pearson, UK. (ISBN: 978-0273750758)

Creswell, J.W. (2009), Research Design: Qualitative, Quantitative and Mixed Method Approach, 3rd Edition. Sage Publishing. (ISBN: 978-1412965576)

Tokuhama- Espinosa T. (2011) Mind, brain and education science: A comprehensive guide to the new brain-based teaching, W.W. Norton & Company Inc 500 Fith Avenue New York, N. Y. 10110

(ISBN: 978-0393706079)

Sousa David A (Ed). (2010) Mind, brain and education: Implication for the Classroom. Solution T Press,
555 North Morton Street, Bloomington, IN 47404 (ISBN: 978-1935249634)

Weiner B I and Graham R. J (Ed) (2013) Handbook of Psychology: Assessment Psychology Vol 10 John Wiley and Sons Inc. New Jersey (ISBN: 978-0470891278)

Ward J. (2010). The Students Guide to Cognitive Neuroscience (second Edition) Psychology Press. Taylor and Francis Group. Hove and New York. (ISBN: 978-1848720039)

Pattern E. K and Campbell R.S. (2011) Educational Neuroscience Wiley Blackwell. Maiden MA (ISBN:
978-1119973195)

Virginia Pickel & Menahem Segal (2014). The Synapse: Structure and Function. Academic Press, USA.
(ISBN: 9780124186750)

Liana Fattore (2015). Cannabinoids in Neurologic and Mental Disease. Academic Press. (ISBN: 9780124170414)

Gerald E. Schneider (2014). Brain Structure and Its Origins in Development and in Evolution of Behavior and the Mind. The MIT Press. (ISBN: 9780262026734)

Roi Cohen Kadosh (2014). The Stimulated Brain Cognitive Enhancement Using Non- Invasive Brain
Stimulation. Academic Press. (ISBN: 9780124047044)

Michael Numan (2015). Neurobiology of Social Behavior Towards an Understanding of the Prosocial
and Antisocial Brain. Academic Press (ISBN: 9780124160408)

John E. Mendoza & Anne L. Foundas (2008). Clinical Neuroanatomy: Neurobehavioral
Approach. Springer. (ISBN: 9780387366005)

Carl Faingold & Hal Blumenfeld (2014). Neuronal Networks in Brain Function, CNS Disorder, and
Therapeutics. Academic Press. (ISBN: 9780124158047)

George R. Mangun (2014). Cognitive Electrophysiology of Attention Signal of the Mind. Academic Press (ISBN: 9780123984517)

Michael Petrides (2014). Neuroanatomy of Language Regions of the Human Brain.Academic Press. (ISBN: 9780124055148)

Michael S. Gazzaniga & George R. Mangun (2014). The Cognitive Neurosciences,
5th Edition. The MIT Press (ISBN: 9780262027779)

Michael S. Gazzaniga, Richard B. Ivry & George R. Mangun (2014). Cognitive Neuroscience The Biology of the Mind, 4th Edition. Norton, New York (ISBN: 978-0393913484)

Dale Purves, Roberto Cabeza, Scott A. Huettel, Kevin S. LaBar, Michael L. Platt & Marty G. Waldorff (2013). Principles of Cognitive Neuroscience, 2nd Edition. Sinauer. (ISBN: 978-0878935734)

Bernard J. Baars & Nicole M. Gage (2010). Cognition, Brain, and Consciousness: Introduction to

Cognitive Neuroscience, 2nd Edition. Academic Press. (ISBN:9780123750709)

Bradley R. Postle (2015). Essentials of Cognitive Neuroscience. Wiley-Blackwell. (ISBN: 9781118468067)

Bernard J. Baars & Nicole M. Gage (2012). Fundamentals of Cognitive Neuroscience: A Beginner's Guide, 1st Edition. Academic Press (ISBN: 978-0124158054)

Jamie Ward (2015). The Student's Guide to Cognitive Neuroscience, 3rd Edition. Psychology Press. (ISBN: 978-1848722729)

Shanbao Tong & Nitish V. Thakor (2009). Quantitative EEG Analysis Methods and Clinical Applications. Artech House, London (ISBN: 978-1596932043)

Robert Snowden, Peter Thompson & Troscianko (2011). Basic Vision: AnIntroduction to Visual Perception , Revised Edition. Oxford. (ISBN: 978-0199572021)

27.4.2 Additional Resources

Bryman, A. & Bell, E. (2011). Business Research Methods, 3rd ed. New York: Oxford University Press, Inc. (ISBN: 978-0199583409)

Cooper, R & D & Schindler, S.P (2003). Business Research Methods. Boston: Irwin McGraw Hill.

Ellet, W. (2007) The Case Study Handbook, 12th Ed. Harvard Business School Press: Boston (ISBN: 978-0073521503)

Eishenhardt, K. M (2002) Building Theories from Case Study Research, in A.M. Huberman and M.B

Miles, eds. The Qualitative Researcher’s Companion, Thousand Oaks, CA: Sage Publications, pp 5-35 (ISBN: 978-07619119113)

List of Journals:
Trends in Neuroscience and Education
The Journal of Neuroscience and Cognition Neuroscience and Cognition
Educational Neuroscience
Developmental Cognitive Neuroscience
Journal of Cognitive Neuroscience

27.5 Assessment

27.5.1 Assessment Summary

Form of Assessment	Weighting
Viva Voce	35%
Full research report	50%
Seminar/poster presentation	15%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark.

26.6 Additional information

For GCN520 Research Project Stage III, workshops/classes and assessments are conducted at USM Health Campus, Kelantan. For working students, please ensure to take leave to attend workshops/classes and assessments. Any changes will be updated from time to time.

We advise students to register for this subject when they have completed data collection. During this stage, students are expected to finish data collection and be in the stage of completing data analysis, interpretation, and the final research report.

Students should submit the finalized report along with all required and complete submission documents, as well as a plagiarism report received from the Postgraduate Office, showing a minimum of 24% similarity, for processing at the school level at least seven weeks before the first day of the exam weeks. Students must ensure that the plagiarism report meets the minimum requirement of 24%. If the similarity percentage exceeds 24%, students should make corrections and resubmit until they achieve the minimum percentage as per university requirements. Please note that submission dates are subject to change and will be updated from time to time by the course coordinator.

All submission documents must be checked and approved by your supervisory team members. Ensure early submission to allow time for feedback, corrections, or amendments. Students are advised to update their progress with supervisors weekly or at least twice a month.

28.0 GCN521 Islam and Neuroscience

28.1 Course Synopsis

28.1.1 Course Statement

This course aims to a) understand the nature of Man in Islam as the foundation of Islamic neuroscience via the study of Quranic verses and Prophetic Traditions with the help of Quranic exegesis and hadith commentaries; b) survey the history of psychology in the Islamic civilization related to neuroscience as found in the thoughts of selected figures and their main works, and c) explore issues in neuroscience, both perennial as well as contemporary, from Islamic perspective in a comparative manner.

28.1.2 Course Credit

4 Credit units

28.2 Learning Objectives

Learning outcomes	1.	To provide explanation that human being is a spiritual-physical entity and how this relates to neuroscience
	2.	To assess intellectual insights and inputs from the Islamic Civilization related to neuroscience
	3.	To relate current issues in neurosciences to the Islamic perspective

28.3 Teaching and Learning Arrangements

This course is taught through lectures which incorporate seminars/presentation, and discussions.

28.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

28.4.1 Main references

Mohd Zaidi Ismail dan Shaikh Mohd Saifuddeen Shaikh Mohd Salleh, 2016, Islam dan Neurosains:Isu dan Cabaran, Institut Kefahaman Islam Malaysia. (ISBN: 978-983-2718-45-1)

28.4.2 Additional references

Al-Ghazalī, 'On Intellect,Its Noble Nature, It's Definition and Its Division,' in The Book of Knowledge (First Book of Iḥyā ʿUlūm al-Dīn), translated by Nabih Amin Faris (New Delhi: Islamic Book Service, 2002)

Al-Ghazālī, Wonders of the Heart, translated by Walter James Skellic (Kuala Lumpur: Islamic Book Trust, 2007)

Ali Issa Othman, The Concept of Man in Islam In the Writings of al-Ghazālī (Cairo,1960)

Arabic and Islamic Psychology and Philosophy of Mind https://plato.stanford.edu/entries/arabic-islamic-mind/

Ayman Shihadeh, Clasical Ash'ari Anthropology: Body, Life and Spirit. The Muslim World. Vol 2. July/October 2012.

Azizan Baharuddin dan Norkumala Awang, 2017, Hidup dan Mati Menurut Islam dan Neurosains, Institut Kefahaman Islam Malaysia. (ISBN: 978-9-832-71860-4)

Blank, R.H. Intervention in the Brain: Politics, Policy, and Ethics. Cambridge, Mass.: MIT Press, 2013.

Bragazzi, Nicola Luigi, Hicham Khabbache, Ignazio Vecchio, Mariano Martini, Riccardo Zerbetto, and Tania Simona Re. "Neurotheology of Islam and Higher Consciousness States." Cosmos and History: The Journal of Natural and Social Philosophy 14, no. 2 (2018): 315-321.

Bulkeley, Kelly. The wondering brain: Thinking about religion with and beyond cognitive neuroscience. Routledge, 2005.

Carter, A. and Hall, W. Addiction Neuroethics: The Promises and Perils of Neuroscience Research on Addiction. New York: Cambridge University Press, 2012.

Clausen, J. and Levy, N. (eds.). Handbook of Neuroethics. New York: Springer, 2015

Fakhr al-Dīn al-Rāzī, Kitāb al-Nafs wa al-Rūḥ wa Sharḥ Quwāhumā, tr. M. Saghīr Maʿsūmī (Pakistan: Islamic Research Institute,1970)

Freeman, M. and Goodenough, O.R. (eds.). Law, Mind and Brain. Burlington, VT: Ashgate, 2009.

Glannon, W. Bioethics and the Brain. New York: Oxford University Press, 2007.

Hick, John. The new frontier of religion and science: Religious experience, neuroscience, and the transcendent. Springer, 2006.

Jihad Hashim Brown, The Problem of Reductionism in Philosophy of Mind and Its Implications for Theism and The Principle of Soul: Framing The Issue for Further Islamic Inquiry, Tabah Foundation, 2013.

Jari Kaukua, Self-Awareness in Philosophy Avicenna and Beyond, Cambridge University Press, 2015.

Karim Douglas Crow, The Intellect In Islamic Thought: Mind and Heart. The Official Journal of the Centre for Civilisational Dialogue. Vol 2. 2006.

Levy, N. Neuroethics: Challenges for the 21st Century. Cambridge: University Press, 2007.

Marcus, G.F. and Freeman, J.A. (eds.). The Future of the Brain: Essays by the World's Leading Neuroscientists. Princeton: Princeton University Press, 2015.

Mostafa Kamal Mokhtar, The Treatise on The Knowledge About The Rational Soul and Its States by Ibn Sina: A Critical Edition and Annotated Translation, Akademika 44, Januari 1994

Nurjanah, Asti Faticha. "Konsep'Aql Dalam Al-Qur'an Dan Neurosains." Nazhruna: Jurnal Pendidikan Islam 1, no. 2 (2018): 276-293.

Peter Adamson and Richard C. Taylor (eds), 2005, The Cambridge Companion to Arabic Philosophy, Cambridge University Press.

Sayadmansour, Alireza. "Neurotheology: The relationship between brain and religion." Iranian Journal of Neurology 13, no. 1 (2014): 52.

Seybold, Kevin S. Explorations in neuroscience, psychology and religion. Routledge, 2016.

Seyyed Hossein Nasr, Intellect and Intuition: Their Relationship from the Islamic Perspective, http://www.studiesincomparativereligion.com/public/articles/Intellect_and_Intuition-Their_Relationship_from_the_Islamic_Perspective-by_Seyyed_Hossein_Nasr.aspx

Sheikh `Alî Bâ Dahdah Islam And The Human Intellect http://www.arriyadh.com/Eng/Islam/Left/WelcomeIsl/More1/Islam-and-the-Human-Intellect.doc_cvt.htm

Syed Muhammad Naquib al-Attas, The =6ttNature of Men and The Psychology of Human Soul (Kuala Lumpur:ISTAC,1990)

Tham, Joseph, Chris Durante, and Alberto García Gómez, eds. Interreligious Perspectives on Mind, Genes and the Self: Emerging Technologies and Human Identity. Routledge, 2018.

Wan Suhaimi Wan Abdullah, Ibn Sina and Abu al-Barakat al-Baghdadi on The Origination of The Soul (Huduth al-Nafs) and The Invalidation of Its Transmigration (Ibtal al-Tanasukh), Islam and Science, Vol 5, No. 2, 2007.

Yasien Mohamed, Human Nature in Islam (Kuala Lumpur: A.S. Noordeen,1998)

https://www.quranandscience.com/

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4975582/

http://tabahresearch.org/wp-content/uploads/2014/03/Jihad-Brown-Reductionism-Tabah-En1.pdf

28.5 Assessment

28.5.1 Assessment Summary

Form of Assessment	Weighting
Essay	30%
Presentation	30%
Final examination	40%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark.

29.0 GCN522 Arts Therapy in Rehabilitation

29.1 Course Synopsis

29.1.1 Course Statement

This course will provide exposure to medical knowledge on related diseases, artistic knowledge and skills and its application in therapy. The courses will be conducted in Kuala Lumpur, Penang and Kelantan.

29.1.2 Course Credit

4 Credit units

29.2 Learning Objectives

Learning outcomes	1.	Explain the basic knowledge of basic medical and art in the field of art therapy
	2.	To build practical skills in art therapy
	3.	To domenstrate the application of art therapy skills

29.3 Teaching and Learning Arrangements

This course is taught through lectures which incorporate seminars/presentation, and discussions. Theoretical knowledge will be thought via combination of face to face and online lectures. Practical session and activities with clients will be conducted in Penang and Kelantan or other places which will be determine.

29.4 Learning Resources

Students can access learning materials mainly journals and textbooks from three libraries which are USM in Kuala Lumpur, USM Main Campus Pulau Pinang and USM Health Campus.

29.4.1 Main references

Christiansen, Charles, Bass, Julie, Baum, Carolyn (2014), Occupational Therapy, Performance, Participation, and Well-Being, 4th Edition. Slack Incorporated.

Paul Holmes, Mark Farrall, Kate Kirk (2014), Empowering Therapeutic Practice: Integrating Psychodrama into other Therapies, Jessica Kingsley Publishers

Paul Holmes, (2015), The Inner World Outside: Object Relations Theory and Psychodrama, Routledge

Marcia Karp, Paul Holmes, Kate Bradshaw Tauvon (2006), The Handbook of Psychodrama

Ronald Anderson, Karen Carnabucci, (2011), Integrating Psychodrama and Systemic Constellation Work: New

Directions for Action Methods, Mind-Body Therapies and Energy Healing, Jessica Kingsley Publishers

Asuncion, J. & Guasch, G. (2009). Creative drawing. London: New Holland.

Stinson, R., Ocvirk, O., Wigg, P., Cayton, P. & Bone, R. (2008). Art Fundamentals: Theory and Practice. Boston: McGraw-Hill.

Judith A. Rubin (2010), Introduction to Art Therapy. Sources and Resources,Routledge

Paul Catalani (2015) Art Therapy and Music Therapy Bundle: (Expressive Arts, Movement Therapy, Art Therapy

Trauma, Therapy Books) Kindle Edition Andrea Gilroy (1994) Art and Music: Therapy and Research. Routledge

29.4.2 Additional references

Hinojosa, J., & Kramer, P. (1999). Frames of reference for pediatric occupational therapy. Lippincot Williams & Wilkins.

Bertoti, D. B. (2004). Functional neurorehabilitation through the life span. FA Davis Company

29.5 Assessment

29.5.1 Assessment Summary

Form of Assessment	Weighting
Quiz	20%
Presentation	20%
Report	30%
Practicum/ Practicum Placement	30%
Total	**100%**

All assessment tasks must be passed to obtain a final grade in this course.
Assessments not submitted officially will not be graded and will receive a zero mark.
All assessments should be submitted following a deadline. Late assignments will incur penalties, or you will receive zero mark.

30.0 Academic Members / Expert

Expert at the School of Medical Sciences:
https://medic.usm.my/experts-ppsp.html

Cognitive Neurosciences Academic Members:
https://rb.gy/nxpclq
https://medic.usm.my/about-us-neuro/member-of-staff/cognitive-neuroscience-team-members.html

31.0 Core and Elective Courses

Semester offered	Core Courses (Compulsory - must register and pass all core courses)	Elective Courses (Must register and pass any four (4) elective courses)
Sem I	GCN501 Trends In Cognitive Neurosciences	GCN510 Computational neurosciences
	GCN502 Functional Neuroanatomy	GCN511 Genetics in cognitive neurosciences
	GCN504 Ethics, cross-cultural and professional issues	GCN512 Testing and assessment in cognitive neurosciences
	GCN505 Transferable skills	GCN513 Cognitive neurolinguistics
	GCN506 Statistics for clinical psychologists and cognitive neuroscientists	
Sem II	GCN503 Social Neurosciences	GCN514 Perception and attention control
	GCN507 Research methodology, protocol development in clinical psychology and cognitive neurosciences	GCN515 Plasticity and memory
	GCN508 Fundamentals in neuroimaging	GCN516 Brain and learning
	GCN509 Research project stage I	GCN517 Comparative cognitive neurosciences
		GCN518 Introduction to neuromarketing and consumer behaviour
		GCN521 Islam and Neurosciences
		GCN522 Art Therapy in Rehabilitation
Sem I & II	GCN519 Research project stage II	
	GCN520 Research project stage III	

*Pass: B- and above (52.0 marks and above)
**Fail: C+ and below (51.9 marks and below)

32.0 Grading for Master of Cognitive Neurosciences

Grade	Point	Marks
A	4.00	80-100
A-	3.67	70-79.9
B+	3.33	64-69.9
B	3.00	58-63.9
B-	2.67	52-57.9
C+	2.33	46-51.9
C	2.00	40-45.9
C-	1.67	36-39.9
D+	1.33	32-35.9
D	1.00	28-31.9
D-	0.67	25-27.9
F	0.00	0-24.9

*Fail: C+ and below

33.0 Termination of Candidature

The University Senate reserves the right to terminate a student if the student's progress is found to be unsatisfactory, upon the expiration of the maximum period of candidature, or due to incomplete or missed registration, or any other relevant situations.

34.0 Dean Awards for this Program

Dean's Awards are recommended for:

- **Full-time students:** CGPA > 3.67 and a minimum of 14 registered credit units for that semester.
- **Part-time students:** CGPA > 3.67 and a minimum of 9 registered credit units for that semester.

35.0 Graduation Requirements

To successfully graduate from the Master of Cognitive Neurosciences Program, students must achieve a minimum grade of 52% or above in all core and elective courses, including any additional prerequisite courses designated by the School of Medical Sciences, USM. Completion of the research project is a crucial requirement for graduation, with students needing to attain a grade of 52% or higher to meet this criterion. In addition to academic performance, students must maintain a minimum Cumulative Grade Point Average (CGPA) of 3.00 to be eligible for graduation from the Master of Cognitive Neurosciences Program.

36.0 Gold Medal

For the selection of the Gold Medal award, given to the best final-year student in Master in Cognitive Neurosciences and donated by Prof. Dato' Dr. Jafri Malin Abdullah, candidates must exhibit outstanding academic achievement, a commendable attitude, and notable contributions throughout their study period.

37.0 Facilities

37.1 School of Medical Sciences

General Facilities

The 'Development Department' (Jabatan Pembangunan) is directly involved in managing and providing general physical facilities to the school. The Audio Visual Aid Unit also plays its role in maintaining the present equipment used in teaching and learning activities.

Below are the facilities that are currently available and under construction:

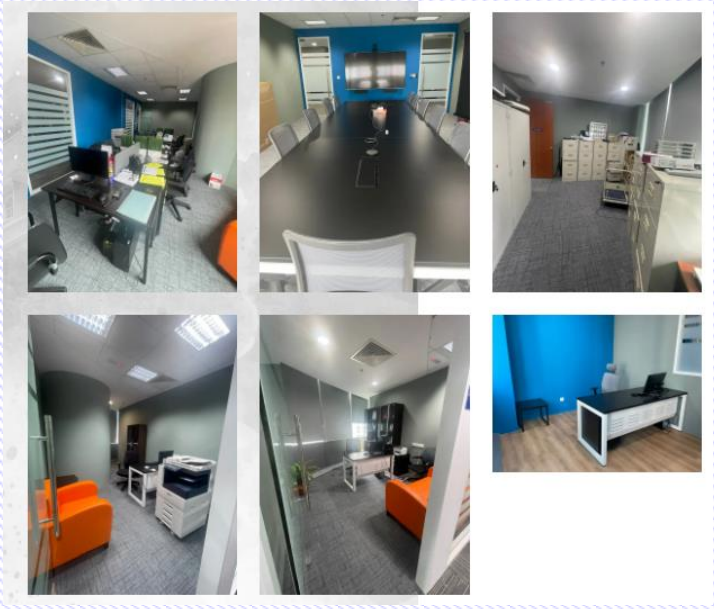
Building / Facilities Name	**Year Construction Completed**	**Total Surface Area (Square Feet/Meter)**	**Function(s)**
Teaching Hospital (HUSM) · Block A · Block B · Block C · Block D · Block E · A & E Unit · Radiotheraphy · Mortuary · Surau HUSM	30 September 1993	147,132 sq.ft 152,496 sq.ft 33,700 sq.ft 31,760 sq.ft 25,920 sq. ft 13,000 sq.ft 35,000 sq.ft 4,800 sq.ft 1,400 sq.ft	1 / 2 / 3 / 4 / 6 / 8 / 9
Student Hostels · Nursing Quarters-Block A · Nursing Quarters-Block B · Desasiswa Murni 1 · Desasiswa Murni 2 · Desasiswa Murni 3 · Desasiswa Murni 4 · Desasiswa Nurani	12 February 1983 12 February 1983 November 1985 November 1987 July 1990 January 1995 December 2002	33,630 sq.ft 33,630 sq.ft 39,000 sq.ft 39,000 sq.ft 58,400 sq.ft 46,600 sq.ft 16,828 m^2	8 / 9
Houseman Quarters-Block C	12 February 1985		
Health Campus Library	11 September 1985	67,837 sq.ft	1 / 2 / 3 / 4 / 6 / 8
Sports Complex	15 October 1989	33,093 sq.ft	9
School of Medical Sciences Phase I	14 July 1990	542,003 sq.ft	1 / 2 / 6 / 7 / 8 / 9

Building / Facilities Name	Year Construction Completed	Total Surface Area (Square Feet/Meter)	Function(s)
School of Medical Sciences Phase II	19 January 1996	350,000 sq.ft	1 / 2 / 6 / 7 / 8 / 9
Clinical Skills Centre	20 February 2000	1,135 m^2	1 / 2 / 3 / 8 / 9
Masjid Kampus Kesihatan	20 February 2000	1,094 m^2	9
Guest House	20 February 2000	886 m^2	9
Block 9	End of year 2000	8,383 m^2	9
Multi-purpose Hall	End of year 2000	2,744 m^2	9
Lecture Hall 1, 2 & 5	July 1990	4,000 sq.ft each	1 / 2 / 3
Lecture Hall 3 & 4	December 1995	4,000 sq.ft each	1 / 2 / 3
Lecture Hall 6	December 2002	4,320 sq.ft	1 / 2 / 3
Lecture Hall 7 & 8	January 2001	3,600 sq.ft each	1 / 2 / 3

37.2 Universiti Sains Malaysia Kuala Lumpur

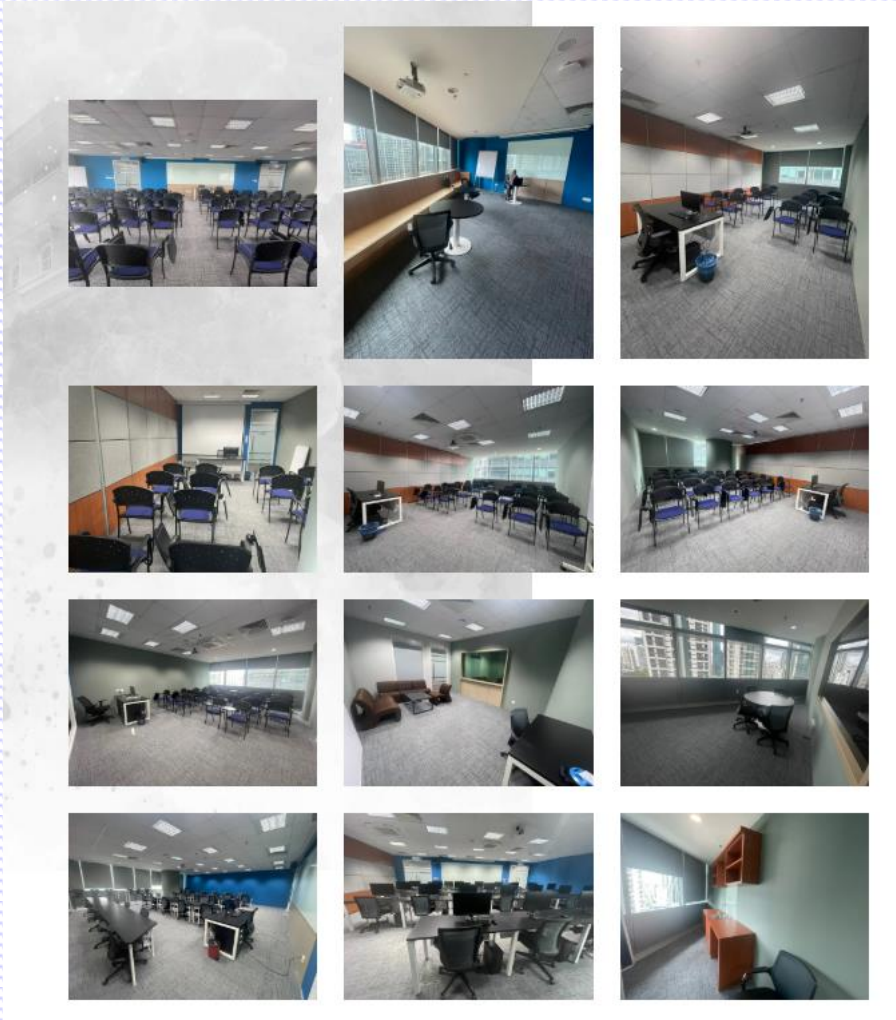
37.2.1 Office Area

Including an administrative office, meeting room, filing room, lecturer room (1-2), LGU room.



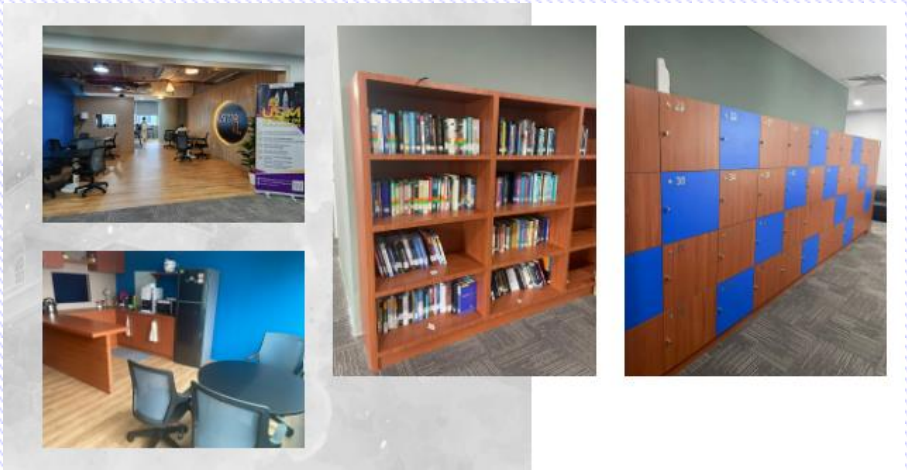
37.2.2 Classroom

Including classroom (1-7), discussion room (1-2), computer lab (1-2) and EEG Lab (1)



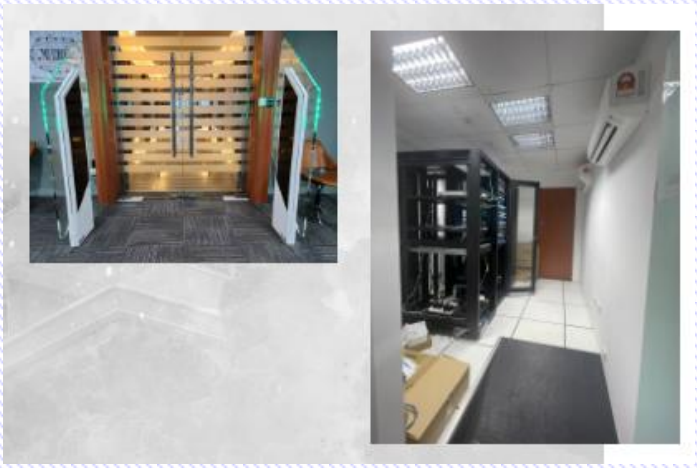
37.2.3 Student Area

Including a student lounge, a pantry, bookshelves and lockers.



37.3 Security and Privacy

Including door access &RFID and server room



38.0 Directory

Directory School of Medical Sciences:
https://directory.usm.my/?direktoristaf/direktori&kod=00055

Directory Universiti Sains Malaysia Kuala Lumpur
https://directory.usm.my/?direktoristaf/direktori&kod=00154

39.0 Academic Calendar Session 2025/2026

UNIVERSITI SAINS MALAYSIA

ACADEMIC CALENDAR - ACADEMIC SESSION 2025/2026

FOR ALL SCHOOLS (EXCEPT FOR SCHOOL OF MEDICAL SCIENCES AND SCHOOL OF DENTAL SCIENCES)

Main Campus : Registration for New Student (26 - 28 September 2025) / **Orientation Week (29 September - 04 October 2025)
Engineering Campus : Registration for New Student (28 September 2025) / **Orientation Week (29 September - 04 October 2025)
Health Campus : Registration for New Student (30 September 2025) /Orientaion Week (30 September - 04 October 2025)**

SEM	WEEKS	ACTIVITIES	DATE	REMARKS
ONE	1	Teaching & Learning (T&L 7 Weeks)	Monday, 06.10.2025 - Sunday, 12.10.2025	
	2		Monday, 13.10.2025 - Sunday, 19.10.2025	
	3		Monday, 20.10.2025 - Sunday, 26.10.2025	20.10.2025, Monday - Deepavali**
	4		Monday, 27.10.2025 - Sunday, 02.11.2025	
	5		Monday, 03.11.2025 - Sunday, 09.11.2025	
	6		Monday, 10.11.2025 - Sunday, 16.11.2025	
	7		Monday, 17.11.2025 - Sunday, 23.11.2025	
	8	Mid Semester Break (1 Week)	Monday, 24.11.2025 - Sunday, 30.11.2025	
	9	Teaching & Learning (T&L 7 Weeks)	Monday, 01.12.2025 - Sunday, 07.12.2025	
	10		Monday, 08.12.2025 - Sunday, 14.12.2025	
	11		Monday, 15.12.2025 - Sunday, 21.12.2025	
	12		Monday, 22.12.2025 - Sunday, 28.12.2025	25.12.2025, Thursday - Christmas Day
	13		Monday, 29.12.2025 - Sunday, 04.01.2026	01.01.2026, Thursday - New Year of 2025
	14		Monday, 05.01.2026 - Sunday, 11.01.2026	
	15		Monday, 12.01.2026 - Sunday, 18.01.2026	
	16	Revision Week (1 Week)	Monday, 19.01.2026 - Sunday, 25.01.2026	
	17	Examination (3 Weeks)	Monday, 26.01.2026 - Sunday, 01.02.2026	01.02.2026, Sunday - Thaipusam
	18		Monday, 02.02.2026 - Sunday, 08.02.2026	02.02.2026, Sunday - Replacement leave for Thaipusam (Main & Engineering Campus)
	19		Monday, 09.02.2026 - Sunday, 15.02.2026	
	20	Mid Semester Break / Industrial Training (4 Weeks)	Monday, 16.02.2026 - Sunday, 22.02.2026	17 & 18.02.2026, Tuesday & Wednesday - Chinese New Year 19.02.2026, Thursday - 1st day of Ramadhan
	21		Monday, 23.02.2026 - Sunday, 01.03.2026	
	22		Monday, 02.03.2026 - Sunday, 08.03.2026	07.03.2026, Saturday - Nuzul Al-Quran
	23		Monday, 09.03.2026 - Sunday, 15.03.2026	
TWO	24/1	Teaching & Learning (T&L 7 Weeks)	Monday, 16.03.2026 - Sunday, 22.03.2026	21.03.2026 & 22.03.2026, Saturday & Sunday - Eid al-Fitr**
	25/2		Monday, 23.03.2026 - Sunday, 29.03.2026	23.03.2026, Monday - Replacement leave for Eid al-Fitr****
	26/3		Monday, 30.03.2026 - Sunday, 05.04.2026	
	27/4		Monday, 06.04.2026 - Sunday, 12.04.2026	
	28/5		Monday, 13.04.2026 - sunday, 19.04.2026	
	29/6		Monday, 20.04.2026 - Sunday, 26.04.2026	
	30/7		Monday, 27.04.2026 - Sunday, 03.05.2026	01.05.2026, Friday - Labour Day
	31/8	Mid Semester Break (1 Week)	Monday, 04.05.2026 - Sunday, 10.05.2026	
	32/9	Teaching & Learning (T&L 7 Weeks)	Monday, 11.05.2026 - Sunday, 17.05.2026	
	33/10		Monday, 18.05.2026 - Sunday, 24.05.2026	
	34/11		Monday, 25.05.2026 - Sunday, 31.05.2026	27 & 28.05.2026, Wednesday & Thursday - Eid al-Adha** 31.05.2026, Sunday - Wesak Day
	35/12		Monday, 01.06.2026 - Sunday, 07.06.2026	01.06.2026, Monday - Replacement leave for Wesak Day (Main & Engineering Campus) 01.06.2026, Monday - Yang di-Pertuan Agong's Birthday
	36/13		Monday, 08.06.2026 - Sunday, 14.06.2026	
	37/14		Monday, 15.06.2026 - Sunday, 21.06.2026	17.06.2026, Wednesday - Awal Muharram
	38/15		Monday, 22.06.2026 - Sunday, 28.06.2026	
	39/16	Revision Week (1 Week)	Monday, 29.06.2026 - Sunday, 05.07.2026	
	40/17	**Examination (2 Weeks) / Examination (3 Weeks)	Monday, 06.07.2026 - Sunday, 12.07.2026	07.07.2026, Tuesday - Georgetown World Heritage City Day 11.07.2026, Saturday - Penang Governor's Birthday
	41/18		Monday, 13.07.2026 - Sunday, 19.07.2026	
	42/19		Monday, 20.07.2026 - Sunday, 26.07.2026	
COURSES DURING LONG BREAK / SEMESTER BREAK	43/20	Long Semester Break / Industrial Training (10/11 Weeks)	Monday, 27.07.2026 - Sunday, 02.08.2026	
	44/21		Monday, 03.08.2026 - Sunday, 09.08.2026	
	45/22		Monday, 10.08.2026 - Sunday, 16.08.2026	
	46/23		Monday, 17.08.2026 - Sunday, 23.08.2026	
	47/24	*T&L	Monday, 24.08.2026 - Sunday, 30.08.2026	25.08.2026, Tuesday - Maulidur Rasul
	48/25		Monday, 31.08.2026 - Sunday, 06.09.2026	31.08.2026, Monday - National Day
	49/26	Examination	Monday, 07.09.2026 - Sunday, 13.09.2026	
	50/27		Monday, 14.09.2026 - Sunday, 20.09.2026	16.09.2026, Wednesday - Malaysia Day
	51/28		Monday, 21.09.2026 - Sunday, 27.09.2026	29 & 30.09.2026, Tuesday & Wednesday - Sultan of Kelantan's Birthday (Health Campus)
	52/29		Monday, 28.09.2026 - Sunday, 04.10.2026	

**This Academic Calendar is subject to change

HEBAHAN BPA BIL. 3/2025 (9 APRIL 2025)
SENAT KE-292 (20 MAC 2025)

-updated June 2025-