Unit Outline

BSC203

Introduction to ICT Research Methods

Teaching Period: TNE January Trimester, 2025

This guide should be used in conjunction with the Handbook as the official source of information about this unit.

Refer to myMurdoch Learning for on-going communication and your learning and assessment content.

Unit coordinator: Dr Joseph Stevens

Acknowledgement of Country

We acknowledge that Murdoch University is situated on the lands of the Whadjuk and Binjareb Noongar people. We pay our respects to their enduring and dynamic culture and the leadership of Noongar elders past and present. The *boodjar* (country) on which Murdoch University is located has, for thousands of years, been a place of learning. We at Murdoch University are proud to continue this long tradition.

Originally written by Prof. Tanya McGill 2015

Revised by Dr Polychronis Koutsakis 2022, 2024

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1 Unit information

Welcome to:

BSC203

Introduction to ICT Research Methods

1.1 Unit Overview

Welcome to BSC203 Introduction to ICT Research Methods.
This unit provides an introduction to research in the information and communications technology (ICT) discipline.

It explores the kinds of research questions addressed in ICT research and provides an opportunity for students to understand the broad range of research approaches used in ICT research including: design research, experimental research, survey research, action research and case study research.

Students will develop both research and project management skills and gain the knowledge and skills needed to critically evaluate ICT research literature.

1.2 Learning outcomes

This unit will build upon the skills developed within BSC100 Building Blocks for Science Students and ICT100 Transition to IT. On completion of this unit you should be able to:

Unit Learning Outcomes	Course Learning Outcomes
1. Apply digital literacy skills to obtain relevant ICT literature.	1. Demonstrate a clear understanding of the role of Information Technology in society.
2. Demonstrate awareness of the varying contexts within which ICT research is conducted and the broad range of types of ICT research	2. Demonstrate a broad and coherent knowledge and understanding of the underlying principles and core concepts of Information Technology
3. Identify ICT research problems and formulate research objectives and research questions; apply written and oral conventions appropriate to ICT research	3. Apply problem solving, design and decision-making methodologies to design, develop and construct components, systems, relevant infrastructure and processes to meet specified requirements
4 Critically evaluate relevant literature and write a literature review	4. Develop the ability and commitment to independently acquire new knowledge and skills in order to stay abreast of developments in Information Technology

5. Demonstrate understanding of a broad range of research approaches including: design research, experimental research, survey research, action research and case study research; demonstrate understanding of ethical considerations in ICT research	5. Demonstrate written, oral and interpersonal communication skills that support the efficient and effective communication of developed systems through documentation, technical reports and presentations to clients and the broader community
6. Apply project management skills and techniques required for planning, managing and documenting projects	6. Demonstrate confidence and competence in applying knowledge and skills of at least one IT discipline through self-directed, independent inquiry and critical self-reflection
7. Undertake basic analysis of quantitative and qualitative data	

1.3 Graduate attributes

This unit will contribute to the development of the following Graduate Attributes:

- Communication
- Critical and creative thinking
- Social interaction
- Independent and lifelong learning
- Ethics
- Global perspective
- Interdisciplinarity

1.4 Strategic Themes

As an institution, the strategic themes of sustainability, equity, diversity & inclusion, and first nations guide and shape much of our activity. This unit covers equity, diversity and inclusion in conducting ICT research.

1.5 Skills Framework for the Information Age (SFIA)

The Skills Framework for the Information Age (SFIA) Framework enables the use of a common language to describe the various skill that exist in the information technology realm, and the levels at which those skills are exercised. For more detail regarding the framework, see: http://www.sfia-online.org

This unit addresses the following SFIA Skills:

SubCategory	Skill	Code	Level
Strategy and Planning	Research	RSCH	2
Change Implementation	Project Management	PRMG	3
Change Implementation	Portfolio, programme and project support	PROF	3
Strategy and Planning	Measurement	MEAS	3

This unit will assist in preparing students for a number of common ICT roles, including: Information Technology Manager Information Technology Researcher, Information Technology Consultant, Data Analyst

1.6 General guidance and requirements

1.6.1 Inclusivity Statement

Murdoch University strives to be a place of belonging for all staff and students. We are committed to supporting and celebrating all community members including all abilities, ethnicities or religions, sexual or gender identities. Homophobia, transphobia, racism, and ablism are not tolerated.

For help and support, please see information and contacts in Health & wellbeing in myMurdoch.

1.6.2 In case of unforeseen disruption to learning and teaching

Where an approved university or campus wide disruption, due to natural, political, or other human crisis (e.g., COVID-19), interrupts our learning, teaching, and assessment plans, then we will move face-to-face classes online and assessments may have an adjustment to the due dates.

For individual needs, consult with Access and Inclusion to see if an individual Access and Inclusion (EQAL) plan is appropriate, or for specific assessment item adjustments, see your Unit Coordinator.

1.6.3 Where to get help for your learning success and wellbeing

Please refer to Support & Advice via myMurdoch for all the information you need for your studies.

This includes:

- Student admin, Exams, Policies (refer to Assessment Policy and others), Key dates, Complaints and appeals
- Learning and study support, including information about Academic Integrity and Murdoch Academic Passport
- Health and wellbeing information, including Accessibility services, Medical and counselling services, Aboriginal and Torres Strait Islander support, and Sexuality and gender diversity support

1.6.4 Key dates and considerations for withdrawing from this unit

If you are considering withdrawing from this unit, see the Withdrawing page for general information and implications.

See the Teaching Periods page for implications of withdrawing at different times of the teaching period, including Census Date, and search for the specific dates for your current teaching period.

2 Contact details

2.1 Unit coordinator

Name:	Dr Joseph Stevens
School:	Information Technology
Campus:	Murdoch
Email:	joseph.stevens@murdoch.edu.au
Phone:	93606475

2.2 Teaching team

You will be notified who your teaching team is at the beginning of the teaching period. The teaching team member will provide you with their contact details.

3 How to study this unit

3.1 Approach to learning

3.1.1 Learning approach underpinning unit

Learning and teaching in this unit is designed and delivered both in independent and collaborative mode, to optimise student engagement and participation.

3.1.2 Unit changes in response to student feedback

Student feedback about BSC203 is welcomed. If you wish to provide feedback please do so at any time. In addition, you will be provided with a formal opportunity to do so in the unit survey towards the end of semester.

3.2 Learning activities & requirements

3.2.1 Learning activities

Students have access to lecture material and recordings via the LMS. All students are assigned a tutor. You can receive help with tutorial activities, and feedback on, these activities from your tutor.

There are readings for each topic and you are expected to have obtained and read them in time to be able to contribute to any online discussion of the topic, and to seek clarification from your tutor as needed.

3.3 Suggested time commitment

As this is a 3 credit point unit, we expect you to spend on average 10 hours per week for the total weeks of this teaching period (or 150 hours overall) working on this unit.

If you are unable to attend classes it is essential that you keep up to date with the material.

4 Unit Schedule

See myMurdoch Learning for details of all learning activities and assessments.

This proposed timetable will help you to plan your study over the semester. Please note that this is a guideline and the order and exact title of topics may change. The general themes will however remain consistent.

Teaching Week	**Topics**	**Readings**
1	Topic 1: What is ICT research?	Oates Chs 1, 2 & 3
2	Topic 2: Introduction to project management	Schwalbe, K. (2021). *An Introduction to Project Management, Seventh Edition*. Chapter 1 https://kathyschwalbe.files.wordpress.com/2021/08/schwalbe-intro-pm-7e-sample-chapter-1.pdf The previous edition of this chapter is also available from My Unit Readings.
3	Topic 3: Conducting a literature review and communicating research results	Oates Chs 6 & 21
4	Topic 4: Scientific investigation	Oates Ch 9 pp126-129
5	Topic 5: Ethical considerations in ICT research	Oates Ch 5
6	Topic 6: Monitoring and controlling project deliverables	Schwalbe, K. (2012). *Introduction to Project Management*. Chapter 4 – Planning Projects, Part 1 (available from My Unit Readings) Project Management Institute (2013) *A guide to the project management body of knowledge (PMBOK guide)* PMBOK (available from My Unit Readings)
7	Topic 7: Conducting survey research	Oates Chs 7 & 15
8	Topic 8: Conducting ICT experiments	Oates Ch 9
9	Topic 9: Data analysis	Oates Chs 17 & 18
10	Topic 10: Creating ICT	Oates Ch 8

	artefacts as part of research	
11	Topic 11: Case study research and action research	Oates Chs 10 &11
12	Unit revision	

5 Assessments

Assessment for this unit is conducted in accordance with the Assessment Policy.

5.1 Assessment summary

No.	Assessment Name	Unit Learning Outcomes	Accreditation Standards	Weight %	Individual / Group	Due Date and Time
1	**Literature Review**	ULO 1,2,4,8		15	Individual	Week 7
2	**Project Management Portfolio**	ULO 6,7,8		20	Individual	Week 11
3	**Poster Presentation**	ULO 1,3,5,7,8		15	Group	Week 12
4	**Final Examination**	ULO 2,3,5,6,9		50	Individual	TBA

5.2 Assessment information

Assessment in this unit will involve a mixture of individual and group tasks designed to introduce you to different aspects of ICT research. These include understanding what research has been done previously in an area and designing and reporting on new research. Written feedback will be provided for all formal assessments. Informal feedback will be provided for tutorial activities on a weekly basis either individually or as a group depending on the task.

5.2.1 Literature Review

ASSESSMENT DESCRIPTION

This assessment will involve conducting a literature review on an ICT research topic, and then presenting what you have found in written form. This will provide an opportunity for you to practise the information retrieval skills learned during the tutorials and to gain experience synthesising and critically analysing published research.

The literature review will be done individually and will address the following unit learning outcomes:

- Apply digital literacy skills to obtain relevant ICT literature (ULO1)
- Demonstrate awareness of the varying contexts within which ICT research is conducted and the broad range of types of ICT research (ULO2)
- Critically evaluate relevant literature and write a literature review (ULO4)
- Apply written and oral conventions appropriate to ICT research (ULO8)

FEEDBACK FOR LEARNING

You can discuss any questions you might have on the assignment with your tutor, prior to submitting the assignment. You will receive written feedback on your submission.

GUIDELINES for SUCCESS

Please make sure that you attend lectures and workshops and that you ask questions for anything that you don't fully understand. Also, please make sure that you fully understand the description of the assignment and that you clearly address the requirements of the assignment. Use of generative artificial intelligence tools is not permitted.

5.2.2 Project Management Portfolio

ASSESSMENT DESCRIPTION

This assessment will involve undertaking a series of project management activities during the semester and presenting a portfolio of deliverables from them. You will have time during tutorials to start work on the activities and but will complete them out of class. The submission will be individual, but you can obtain help with your work during class. This assessment will address the following unit learning outcomes:

- Apply project management skills and techniques required for planning, managing and documenting projects (ULO6)
- Undertake basic analysis of quantitative and qualitative data (ULO7)
- Apply written and oral conventions appropriate to ICT research (ULO8)

FEEDBACK FOR LEARNING

You can discuss any questions you might have on the assignment with your tutor, prior to submitting the assignment. You will receive written feedback on your submission.

GUIDELINES for SUCCESS

Please make sure that you attend lectures and workshops and that you ask questions for anything that you don't fully understand. Also, please make sure that you fully understand the description of the assignment and that you clearly address the requirements of the assignment. Use of generative artificial intelligence tools is not permitted.

5.2.3 Poster Presentation

ASSESSMENT DESCRIPTION

In this assessment you will work in small groups to produce a research poster and then present it and answer questions about it in your tutorial group (or online for external students). The following link provides useful information about managing group work: https://student.unsw.edu.au/groupwork

This assessment will address some of the following unit learning outcomes:

- Apply digital literacy skills to obtain relevant ICT literature (LO1)
- Identify ICT research problems and formulate research objectives and research questions (LO3)

- Demonstrate understanding of a broad range of research approaches including: design research, experimental research, survey research, action research and case study research (LO5)
- Undertake basic analysis of quantitative and qualitative data (LO7)
- Apply written and oral conventions appropriate to ICT research (LO8)

5.2.4 Final Examination

There will be an examination at the end of the unit. You will be advised about the precise format of the examination during the semester. Sample questions will be provided.

This assessment will address the following unit learning outcomes:

- Demonstrate awareness of the varying contexts within which ICT research is conducted and the broad range of types of ICT research (LO2)
- Identify ICT research problems and formulate research objectives and research questions (LO3)
- Demonstrate understanding of a broad range of research approaches including: design research, experimental research, survey research, action research and case study research (LO5)
- Apply project management skills and techniques required for planning, managing and documenting projects (LO6)
- Demonstrate understanding of ethical considerations in ICT research (LO9)

Students may inspect their marked examination scripts and discuss the marking with your unit coordinator within 14 days of the posting of results.

5.3 Academic integrity

Murdoch University expects students and staff to pursue the highest standards of integrity in all academic activity. Academic integrity involves behaving ethically and honestly in scholarship and relies on respect for others' ideas through proper acknowledgement and referencing of publications.

Academic misconduct is treated seriously and penalties may apply.

More information about academic integrity can be found at https://goto.murdoch.edu.au/learningstudy. To help you learn about academic integrity practices, all students are required to complete the Murdoch Academic Passport (MAP100). Please also note the library citation guide.

Murdoch University makes use of content matching software to detect submitted work that is not original. When you submit an assessment to myMurdoch Learning, it is checked by this software. Your Unit Coordinator may apply other processes to verify that your submitted assessment is your own work.

In this unit, we undertake these practices to assure academic integrity:

- Use of Turnitin content matching software
- Students have opportunities every week to seek help and feedback

5.4 Acceptable use of Generative AI

(adapted from a relevant policy written by Dr. David Murray)

Generative AI, a subset of artificial intelligence, is a rapidly evolving technology that has the potential to revolutionize our work, and the world, as we know it. This technology will likely be transformative, and as educators we have the job of walking a tightrope of adequately preparing you with fundamental skills and allowing you to move into your work life with exposure and skill with the state-of-the-art tools. You should expect a mix of tasks, with some tasks preventing its use and some tasks permitting its use. You should use this policy as a default guide in this unit. Unless there is more specific information related to the task fall back on these guidelines on the appropriate use of this technology.

Generative AI refers to algorithms and models that can generate new content. They can create anything from written text, to images, music, and even code. Some of the most popular generative models include GPT-3, DALL-E, and CoPilot. My recommendation is that you use Microsoft's CoPilot https://copilot.microsoft.com/ where you have free

access and your data is protected. My advice is that you spend some time working with AI such that you are proficient in its use. I do, however, want to mark your work, and so the following are guidelines for the appropriate use.

You should use generative AI for learning like you would a friend or colleague. Here are some things you **would never do** with a friend or colleague:

1. Ask them to write your report or documentation for you and attach your name to it

2. Give them the problem and ask them to write the code for you

3. Give them a write up of a task, and ask them to improve the level of language to a university level

4. Get them to write Powerpoint slides for you.

Tasks where you might ask a friend for help:

1. Proof read your work – You can and should use Grammarly for this, do not ask generative AI for a re-write.

2. Discuss and ask about approaches and concepts, so that you can better understand them, with questions such as: “where might it be appropriate to use X?” or “Tell me about Y with some relevant examples”.

I think that you will quickly see that, by default, if we approach our tasks and assignments with integrity, we can approach Generative AI as if it were a trusted friend. By following these approaches, you can ask for help, advice and assistance without ruining the educational experience that has been set up for you.

Finally, clear thinking and excellent and persuasive writing are mutually reinforcing. Similarly, the development of numeracy skills is crucial for problem-solving, decision-making, and critical thinking across various fields. These are the skills that you are here at University to develop. Don’t limit your own long-term development and potential through overreliance on GenAI to do the foundational work for you. We’re here to help set you up for a career of remarkable work. You should use software tools such as Word, Grammarly, and Excel, but unless instructed to, you should not use AI for writing, calculations or analysis except as a Socratic tutor your thinking and work.

5.4.1 Unsure about a new service xyz or a different use case?

AI will increasingly become embedded in more and more services. In future scenarios, you may be unaware that you are using AI and it is generating answers. Different units will have different requirements. Please check the policy of each individual unit and assignment. If you are in any way unsure, please ask!

5.5 Extensions and late submissions

This unit follows Murdoch policies and procedures, particularly the Student Assessment Support Procedure and Assessment Procedure, with regards to assessment submission and extensions, supplementary and deferred assessment, and other expectations.

In this unit, extensions and late submissions follow these requirements:

- Assessments submitted after the due date without approval will not be marked, and you will receive 0% for the assessment.
- You can apply for an assessment extension without penalty. See the Student Assessment Support Procedure for all requirements.

Applying for Extensions:

Student has no Supporting Documentation (extensions of a maximum of five working days from the due date):

- Students should apply, before the assessment due date, directly to their unit coordinator. The application should include the reasons for the extension.

- If the reason for the extension is reasonably within the control of the student (e.g. poor time management), students are required to create a plan to prevent future late submissions and append this plan to their application. Students are expected to work towards rectifying the reasons for the extension, as outlined in their plan, to avoid future applications of this nature.
- A maximum of one extension without supporting documentation will be approved per student for each unit offering.
- Students may be denied an extension without supporting documentation where they have applied across multiple units in their course.

Students are responsible for managing their time and maintaining an awareness of when assessments are due in all their units. You are being prepared for the workplace and should conduct yourself in a professional manner. If you are sick and unable to submit your assessment on time, then we expect you to provide an in-writing explanation as well as a copy of the current state of your work. For a time-critical work project, this would enable a team member to finish it.

Students who have mismanaged their time will be asked to provide a thorough explanation including what they plan to do to prevent this from re-occurring. This correspondence may be recorded in a centralised system for future use, should the requests for extensions continue. Extensions are limited to a maximum of 5 working days and only one extension per unit may be considered unless the reasons are exceptional.

Student has Supporting Documentation:

- Extensions beyond five working days may be granted upon exceptional circumstances beyond the control of the student. Supporting documentation must be provided.
- Please see Student Assessment Support Procedure for all requirements of supporting documentation.

If your situation is prolonged or re-occurs throughout the semester then you may be requested to consider a retrospective withdrawal: https://www.murdoch.edu.au/mymurdoch/support-advice/student-admin/enrolment/withdrawing/retrospective-withdrawal

5.5.1 Assignments & In-person assessments

No late penalties are applied in the School of IT due to late submission, but work that is not handed in on time, without an extension, will not be marked and will receive zero marks as outlined above unless the procedure is followed.

In-person assessments such as presentations will also receive no penalty, but the same requirements above must be met for the work to be marked. The students must make themselves reasonably available within 3 working days of the end of the extension, should one be provided.

5.5.2 Small Stakes Assessments

For weekly quizzes, workshop performance, weekly lab code reviews, or any small-stakes continuous assessment, there are no extensions or deferred assessments for any reason. These assessments will compensate, for example, by assessing your best 8 of 10 code review opportunities or workshop performances. Another common implementation may be to drop the lowest 2 of your 12 weekly quizzes. An acknowledgement of the inevitable speed humps of life are built into these assessments.

Generous quiz timeframes and universal design should be used to mitigate against the lack of consideration for extenuating circumstances and individualised adjustments in these assessment types. The onus is on the student to manage their time, and students should not request extensions or extenuating circumstances on these items.

5.5.3 Final Exams

The rules for final exams are found here: https://www.murdoch.edu.au/mymurdoch/support-advice/student-admin/exams/deferred-assessments. These are not set at the unit level but at the university level so please follow the university level rules for deferral of exams.

5.5.4 Access & Inclusions

Students who feel that their disability, medical condition or disability caring responsibilities may impact on their capacity meet assessment submission are strongly advised to visit Access and Inclusion as early as possible to discuss potential needs and assistance.

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5.6 Determination of the final grade

Students must attempt all assessments and receive an overall mark of 50% or above. Refer to Reporting of Results in the Assessment Policy for information about marks and grades.

6 Learning resources

6.1 All learning resources

Your learning resources and any updates are provided through myMurdoch Learning (LMS) in the myMurdoch portal.

Learning resources within the myMurdoch Learning online environment for this unit will be

1. integrated within the sections and learning activities
   and/or
2. through tools such as:
   - My Unit Readings
   - Collaborate
   - Echo360

The specific types of learning resources that we use include lecture videos, academic articles, case studies, websites, software/applications.

6.2 Essential learning resources

Books:

Required

The following textbook is required for the unit. It will also be very useful for BSC301 Applied Research Skills in ICT.

- Oates, B. J. (2006), Researching Information Systems and Computing, SAGE Publications: London.

Other references:

In addition to the readings from the textbook, there will be additional readings for some topics. These will either be available through the LMS (see My Unit Readings), given out in class, or freely available on the Internet.

The following book is recommended reading for the project management material that will be covered (some chapters will be available from My Unit Readings):

- Schwalbe, K. (2012). An Introduction to Project Management (Fourth ed.). Minneapolis: Kathy Schwalbe LLC.

You will also make use of the library's databases to find journal articles and conference papers:

http://library.murdoch.edu.au/Find-information/Databases/

Computing Resources:

Microsoft Project will be used for project management activities. It is available in the computer labs on campus, and as a download for enrolled students. You can get information on how to obtain it via Azure Dev Tools from https://murdochuniversity.sharepoint.com/sites/DITMS-Tech/ITSubscriptions/SitePages/Azure%20Dev%20Tools.aspx

We will use Microsoft Excel and the statistical software package SPSS to analyse research data. This software is available in computer laboratories on campus. It is also possible to download a freeware alternative to SPSS called PSPP (https://www.gnu.org/software/pspp/).

EndNote is bibliographic management software that may be useful for keeping track of your references and for referencing in assignments. Murdoch University has a university-wide site licence agreement for EndNote. For more information see http://libguides.murdoch.edu.au/Endnote

7 Academic Advice and Student Support

Need guidance on study related issues?
Use this flowchart or seek direct assistance from Student Support Services or MyMurdochAdvice.

Contact your Tutor if you have . . .

- Questions about content covered in tutorials or practical sessions.
- General questions about completing assessments.
- Concerns about another student or your learning needs.
- Positive and constructive feedback.

→ Tutor

Contact your Unit Coordinator if you have . . .

- Questions about unit content, assessments, attendance or tutorial times.
- Questions on marked assessments.
- Request a re-mark/review of a marked assessment.
- Academic issues with your learning in this unit.
- Positive and constructive feedback.

→ Unit Coordinator

Contact your Academic Chair if you have . . .

- Academic and assessment issues that haven't been adequately addressed by the Unit Coordinator.
- Academic issues relating to progression through your degree, withdrawal from a unit or intermission.
- Positive and constructive feedback.

→ Academic Chair

Contact your Head of School if you have . . .

- Academic, assessment or other issues that haven't been adequately addressed by your academic chair or you aren't comfortable discussing with your Academic Chair.
- Formal request for re-mark/review in accordance with policy and procedure, where Unit Coordinator has not undertaken.
- Complaints or appeals relating to your studies that haven't been adequately addressed. Visit Complaints and Appeals for more advice.
- Positive and constructive feedback.

→ Head of School

To further escalate an appeal or complaint, contact the Associate Dean Learning and Teaching and/or see Complaints and Appeals for formal appeals procedures.

STUDENT SUPPORT SERVICES: https://goto.murdoch.edu.au/supportservices

LEARNING AND STUDY SUPPORT: https://goto.murdoch.edu.au/learningstudy

MYMURDOCH ADVICE: https://goto.murdoch.edu.au/mymurdochadvice

COMPLAINTS AND APPEALS: https://goto.murdoch.edu.au/ComplaintsAppeals