UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF INFORMATION & COMMUNICATION TECHNOLOGY (PERAK CAMPUS)

FINAL YEAR PROJECT (FYP)

Course structure with UCCD2502 Introduction to Inventive Problem Solving and Proposal Writing

INFORMATION BOOKLET

Prepared by FYP Committee

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*Note: Please always refer to the most updated version

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Important Notice to All Students

Plagiarism is a serious offence. Copy and paste for the report content is prohibited.

You must sign the report submission declaration to confirm that your FYP report has been done by your own efforts without any plagiarism.

1 Introduction

Every UTAR student undertaking a degree program in FICT is required to complete a project under the supervision of a FICT (Perak) academic staff or an external supervisor from the industry. In the case whereby an external supervisor is appointed, a FICT (Perak) staff shall be appointed as a co-supervisor for the student. The project should provide student with the opportunity to bring together the academic knowledge and skills acquired from the range of modules already studied. In general, the whole project can be divided into three parts, namely Introduction to Inventive Problem Solving and Proposal Writing (IIPSPW), Project I and Project II, which are to be completed by Year 3.

Although students are required to take the modules starting from Year 2 semester 2 or 3, they are encouraged to explore the areas of interest, identify the project supervisors and define a project topic if possible, as early as the first semester of Year 2. The detailed planning of the project is described in the following sections.

The objectives and learning outcomes of the three modules are listed as below. (Note: *Students are encouraged to undertake Introduction to Inventive Problem Solving and Proposal Writing prior to taking Project I*)

The objectives of Introduction to Inventive Problem Solving and Proposal Writing
[1] To enable students to apply inventive problem solving techniques to generate ideas and solutions to innovative problems;
[2] To equip students with relevant skills in planning, writing, and presenting project proposals;
[3] To prepare students to develop problem statements, conduct efficient literature search, review literature, and design research studies to address different types of problems.

The learning outcomes of Introduction to Inventive Problem Solving and Proposal Writing
After completing this unit, students will be able to:
[1] Describe basic models and tools for solving inventive problems;
[2] Perform systematic analysis to gain knowledge of product characteristics and evolution trends;
[3] Identify the technical contradiction of a problem and use the contradiction matrix to determine the inventive principles, which could lead to an innovative solution;
[4] Identify the key components in a proposal and explain how they relate to the justification for a project;
[5] Conduct effective search and critical review of the relevant literatures;
[6] Write and present a structured proposal for an ICT research and development project.

The objectives of Project I:
[1] To introduce a general approach in starting a project, the need for proper documentation and reporting, and professional presentation of work undertaken;

[2] To equip students with the relevant research and technical skills that may be utilized for the formulation and development of a project;

[3] To introduce current Information & Communication Technology (ICT) related trends and development.

The learning outcomes of Project I:

After completing this unit, students will be able to:

[1] Identify a topical or problem area of interest for an ICT final year project (FYP).

[2] Define the scope and objectives of the FYP.

[3] Develop a project plan for the FYP.

[4] Write formal documentations, such as proposal, literature search summary, work log, and report, required for the FYP.

[5] Determine suitable research methodologies and tools for problem analysis and project development.

[6] Demonstrate presentation skills in project proposal, and demonstrating technical work.

The objectives of Project II:

[1] To encourage students to demonstrate their technical skills, and put in practice their experiences and knowledge.

[2] To provide an opportunity for students to highlight and realize in projects, their grasp of interdisciplinary knowledge, including business domain knowledge.

[3] To provide an opportunity for students to further their research, in their discipline and that of the industry, and report their findings appropriately.

[4] To provide an avenue for students to document and showcase their project, e.g. to potential employers.

The learning outcomes of Project II:

After completing this unit, students will be able to:

[1] Review and re-evaluate the project scope, objectives, and project plan proposed in Project I.

[2] Compile and perform literature and technical review for the project.

[3] Formulate project requirements into specifications or models.

[4] Analyse the specifications or models and select suitable tools or methods for project development.

[5] Develop a system or theorem based on the stated specifications or models.

[6] Evaluate the system or prove the theorem.

[7] Write a formal report for project outcomes.

[8] Present or demonstrate the project results.

Generally, all projects will involve elements of preliminary investigation, project design, realization of design and evaluation.

1.1 Selection of Project Area and Project Proposal

In Year 2 Semester 2 or 3, students are expected to register for Introduction to Inventive Problem Solving and Proposal Writing (IIPSPW). Among the objectives of this course is to equip students with relevant skills in planning, writing and presenting project proposals. At the end of this course, students will have identified and confirmed their project titles with the respective potential (FYP) supervisors together with a completed preliminary proposal report. Students are required to register their project title with the approval of an academic staff as the supervisor (by week 7).

Students who have taken IIPSPW and wish to modify their project titles or change supervisors when enrolling in FYP I may do so subjected to the agreement of the IIPSPW supervisor and the new supervisor for supervising FYP I and II projects.

Students who have completed their FYP I should not change their project completely; for example, from an Android application development to a Webpage development. However, students can change their project title; for instance, the original project is about developing a retail POS system, and need to add or reduce the objectives or scope of the project due to additional modules can enhance the system or to reduce the size of the project. The change of project title at this stage is mainly to better describe the project objectives.

A starting point to tackle the final year project is the identification and selection of an area of interest. A session will be held in IIPSPW class whereby relevant lecturers are invited to give a short talk to students. This will expose students to the areas available and the people involved. To know better an area of work, students can seek out potential project supervisors for further discussion. Also, students can look into the Internet for more information on the areas of their own interests. After agreeing with a supervisor on the area of study (and perhaps with a tentative title), students can then perform background reading for their final year project endeavour.

A list of suitable project topics or areas offered by the lecturers is available at the faculty website at http://www.utar.edu.my/fict-pk/index.jsp?fcatid=211&fcontentid=2876. Students are also encouraged to suggest their own projects or projects in collaboration with firms in the industry (where appropriate). To do so, students must prepare a draft proposal and discuss with the relevant lecturer to ensure that the proposal is of a suitable level and standard.

A FULL proposal is to be submitted at the middle of Final Year Project (Project I) for evaluation by the supervisor, after which students would start working toward the completion of a prototype of their projects. Students need to meet their individual supervisors on regular basis, at least, once per fortnight.

By the end of Project I, students will hand in their project prototype for evaluation by the supervisor.

1.2 General Classification of Final Year Project

The following is a guide and framework for setting up and running your project. There are two broad categories:

- Academic research projects;
- Application development projects.

These categories are merely a guide to help students design their projects. While most projects will fit neatly into one of these two categories; some projects may have characteristics of both of these categories. It is important for students to recognise what project category that their project might fit into so as to enable them to address the relevant learning outcomes and requirements in which will help defining clear and concise project objectives.

1.3 Academic Research Projects

Academic research projects are undertaken to investigate a research question. An academic research project must contain a research contribution from the student, for example, the development of a model or the design of an algorithm towards analysing/solving a problem. A research project might include data gathering; however, the gathering of data in itself does not constitute an acceptable level of research effort by the student. Rather some rigorous analysis of the data and/or the development of some deliverable based on the data are required.

The deliverable should have the potential for further research used by a third party, for example the supervisor, an external body or other stakeholders in the project. Furthermore, academic research projects must be designed so that it is clear of what factors affect the validity and generalization of the results.

In developing Academic Research projects, your proposal should state:

- The research question to be addressed;
- Any research initiative or project that your project is a part of;
- The research methods and tools to be used;
- How you will judge the validity and generality of your results;
- In what ways the project may contribute to related research activities.

1.4 Application Development Projects

These types of projects involve design and construction of a prototype for an application that can be in the form of hardware or software or a mixed hardware/software. The design and construction must be non-trivial. The development should follow an established hardware/software engineering method. In exceptional cases, students are permitted to do projects that involve analysis and design without a construction. The outcome of such project should provide sufficient information for implementation by a third party in the future. Alternatively, a formal theory may be built and its soundness and application are demonstrated. The following should be stated for Application Development projects:

- The purpose of the hardware/software;
- In what way the project is novel;
- What theory (if any) underpins the project;
- Applicable hardware/software engineering methods;
- What tools will be used, so far as decided;
- Methods envisaged for testing and evaluating the hardware/software;
- How the complexity of the work merits it being a final year project.

1.5 Combining Project Categories

For projects that do not fit neatly into one of the two project categories, the union of the respective lists of details must be clearly stated in the proposal.

2 Project Milestone and Procedures

2.1 Introduction to Inventive Problem Solving and Proposal Writing (UCCD 2502)

Activity	Deadline[1] *Specific schedule will be posted in the FYP website*	Action Required (AR) by Supervisor/Moderator/Student
Meeting to discuss the process of the Project, TRIZ	Beginning from Week 1	**Student:** Attend scheduled lecture classes
Lecturers present their topics	Week 4	**Supervisors:** Present topics and area of interest to students.
Students approach and identify supervisors	Week 4 to Week 6	**Student:** Select a topic of interest and look for the relevant lecturers for further discussion about the project Students to sign two copies of the Final Year Project Registration form to undertake the proposed project title under the supervision of the chosen supervisor. Both forms must also be signed by the supervisor. Students to submit the completed Final Year Project Registration forms to the supervisor (1 copy) and FGO (1 copy).
Students perform the literature search, fact findings, and discussion with their supervisors about the project scopes, objectives and planning	Week 4 to Week 13	**Student:** Students to meet with their supervisor on a regular/weekly basis to update their progress.
FYP committee assigns supervisors	Week 7	**FGO:** Consolidate all Project Registration forms. **FYP Committee:** Assign supervisor to students who have no projects.

Submission of TWO(2) preliminary proposal report	Week 12	**Student:** Students to submit a Preliminary Proposal report to the UCCD 2502 subject lecturer and the supervisor.
Oral proposal presentation	Week 14	**Supervisor:** Supervisor to arrange for the oral presentation time and venue with their respective students. Supervisor to evaluate their students oral presentation using the marking scheme provided
Supervisors submission of presentation marks	Week 15	**Supervisor:** Supervisor to submit the oral presentation marks to the FGO

Note:
[1] Datelines for each milestone is shorten by half if the subject is conducted during the short (7 weeks) semester

2.2 Final Year Project I Schedule

Milestones	Dateline [2] *Specific schedule will be posted in the FYP website*	Action Required (AR) by Supervisor/Moderator/Student
Meeting to discuss the process of the Final Year Project Weekly Log	Weekly	**Student:** Weekly discussion with supervisor. Students to submit a weekly log to report the progress of the project work. Supervisors to verify and sign on the weekly log and keep them for the record.
Submit TWO (2) Project Proposals (to Supervisor)	Week 7	**Student:** Students to submit a Project Proposal Report. Students to ensure that report has been checked by Turnitin. **Supervisor:** Supervisors to evaluate the report according to the Project Proposal Marking Scheme. Create an account for students in Turnitin. **Moderator:**

		Moderator reads and gives feedback of the submitted report.
Oral presentation / Prototype Demonstration	Week 13, 14	**Student:** Student presents his/her Project Proposal. **Supervisor:** Supervisors to make the necessary arrangement with their students and moderators to evaluate the oral presentation according to the Report Proposal Marking Scheme. **Moderator:** Moderator has to attend and assess the oral presentation.
Submission of results	Week 15	**Supervisor and Moderator:** Submit the evaluated result separately to FGO personnel in charge. **FGO:** FGO to collect the results.

Note:
[2] Datelines for each milestone is shorten by half if the subject is conducted during the short (7 weeks) semester.

2.3 Final Year Project II Schedule

Milestones	Dateline [3] *Specific schedule will be posted in the FYP website*	Action Required (AR) by Supervisor/Moderator/Student/Faculty Office
Meeting with supervisor Weekly Log	Weekly	**Student:** Students to submit a weekly log to report the progress of the student's project work. **Supervisor:** Supervisors to verify and sign on the weekly log and keep them for the record.
Submit draft reports to the supervisor.	Week 6 to week 10.	**Supervisor:** Supervisors to advice and make correction to the draft and returns it back to the student.

		Create an account for students in Turnitin.
		Student: Students to revise the draft based on the advice (**major/minor** corrections). Students to ensure that report has been checked by Turnitin
Submit TWO (2) corrected comb-bound full report copies to the supervisor. (Marked by Supervisor only)	Week 12.	**Supervisor:** Supervisor to pass a comb-bound copy to their moderator for review. Supervisor to mark the report according to the Full Report Marking Scheme. Supervisors to make minor corrections on the report, if any.
Oral Presentation and Product Demonstration. (Assessed by Supervisor and Moderator)	Week 13 and Week 14.	**Supervisor and Moderator:** Supervisor to liaise with their respective moderator to arrange the venue, time, tools, equipment, marking sheet etc. for the viva. Supervisor and moderator to assess and evaluate the student's project work. The Supervisor to pass the comb-bound report to the student for final **minor correction**. (Comment: this is returned to the student for making correction) **All marks must remain confidential and not to be disclosed.** **Student:** Student to do the final **minor correction** on the report. Students to submit the final report to the Supervisor.
Submission of Results	Week 14	**Supervisor and moderator:** Submit the evaluation result to FGO separately. Any disagreement (more than 10%) on the marks allocation can be brought forth to the FYPC for further discussion. **FGO:** FGO to collect the results.

Submit TWO (2) sets of softcopy to FGO. (include the poster in the softcopy)	Week 15	**Student:** Student to submit TWO(2) sets of softcopy to the FGO. The softcopies should contain the following (if any): • The complete executable program • The source codes • The full report in Microsoft Word **FGO:** To collect and keep the softcopies.

Note:
[3] Datelines for each milestone is shorten by half if the subject is conducted during the short (7 weeks) semester.

3 Pitfalls and Problems

The final year project will be a demanding but exciting learning experience. However, it is not without problems, if not identified and addressed, could seriously affect the final result and ultimately reduce your grade. This section addresses some of these problems and provides tips on how to avoid them.

a. ***The "Overachiever" Problem***. A common problem is selecting a topic that is far too ambitious for the allotted time. Remember that you have only 12-13 weeks to finish the coding, debugging, and testing. Be careful not to select a topic that is unrealistically large. This can lead to frustration as well as errors caused by "cutting corners" and hurrying through the implementation. Discuss with your supervisor the scale of what you are planning. If he or she thinks it may be too large, consider implementing the project in stages, and complete the project stage by stage. When one stage is working, then move on to the next stage. If you cannot complete the project, you will still have a functioning system.

b. ***The "Do It Tomorrow" Problem***. Thirteen weeks sounds like a long time, but it goes by quickly. You need an implementation schedule that allocates reasonable amounts of work throughout the entire semester. Then you must stick to that schedule. Don't be tempted to postpone work on the project because week 13 seems so far off. All that happens is that during the final few weeks you rush madly to get something working, and software implemented in a rush rarely works correctly!

c. ***The "Sleeping Member" Problem***. In the ideal world, all team members have equal ability, equal interest in the problem, and work equally hard. This may not happen in the real world. You may have one or more team members who do not carry their share of the workload, not because of a lack of ability, but rather lack of interest or motivation. This is a serious problem because, although part of your grade is based on each individual's effort, another part is based on successfully finishing the project. A non-contributing team member can slow down or prevent completion of the work. If you have a teammate who is not doing his or her share of the work, talk to them and stress the importance of everyone's role. If this does not solve the problem then talk to your supervisor. Do not let the failure of others prevent you from completing the work and receiving a good grade.

d. ***The "Poop Out At The End" Problem***. You have worked hard for 13 weeks to complete this project. You have spent many late nights and caught hundreds of bugs, and the program is working, so are you done? Absolutely not! The project grade is not based only on the programs you developed but also on your written reports and oral presentations. Remember that even though you may be 'burned out" from implementation, there is still work to be done. Do not produce a poorly written document or give a poorly organized presentation. That will negate much of your good work. Put in the time needed to prepare both a well written, high-quality final report and a well organized, polished presentation. In fact, you should write your project document starting on the first day. The project document is the blueprint of your project, so you should

write the document before implementing your project. A good job on these last steps will insure that you receive a grade that fairly represents the work you have done.

4 Project Report Contents and Arrangement

Students should not copy large sections of books and/or reports. By copying, the change in writing style and the way information is presented can be easily detected. Students will be penalised for copying. Whenever values of short passages have been quoted, the full reference should be given. Students will be penalised for not referencing previous work.

4.1   Report Contents and Arrangement Guidelines for UCCD2502 Inventive Problem Solving and Proposal Writing

Ensure the report is presentable, free from grammatical and writing errors.

Item No.	Arrangement of the Proposal	Content
1	Title Page	1 page. Refer to Appendix E.
2	Table of Contents	Refer to Appendix E. It should list all the chapters and their corresponding sections and subsections found in the report.
3	List of Tables	Refer to Appendix E. It should list all the tables and their corresponding page numbers found in the report.
4	List of Figures	Refer to Appendix E. It should list all the figures and their corresponding page numbers found in the report.
5	List of Symbols	Refer to Appendix E. It should list all the symbols found in the report and their corresponding meanings.
6	List of Abbreviations	Refer to Appendix E. It should list all the abbreviations found in the report and their corresponding meanings.

7	Sectioning	Number of pages in each section should be between 10 to 15 pages. Students should familiarize themselves with report writing skills such as division of work and report sectioning. Each chapter should begin on a new page. Within a chapter, use as many sections and subsections as possible and where appropriate. Subsection is limited to 3 levels only.
		
		Chapter 1: Project Background
		    o Give a descriptive view on the field (or sub-field) of the project and historical development prior to the project. This includes answering the following questions:
		    -What is the problem domain of this project?
		    -Who have the problem and need a solution?

-Why is the problem so important?

Chapter 2: Literature Review
- o Highlight what is the current practice or existing research/results towards the problem. Discussions should include:
  -What have other researchers/developers done to resolve the problem?
  -What are the strengths of their solutions?
  -What are the weaknesses/limitations of their solutions?
  -How these weaknesses/limitations can be resolved?

Chapter 3: Project Scope and Objectives
- o Describe what you are going to deliver at the end of the project. (e.g. a piece of software, a piece of hardware, an improvement plan of a system, a development framework, a research survey, a model of a system, or simulation result, etc). Give a general overview of your solution of the problem. For the Project Objectives, describe the purpose and aims of the project which give more detailed information than the project scope. Other questions to consider in this section:
  - Is the title clear and specific enough?
  -What is the proposed solution of this project to tackle the above problem/limitations?
  -What is the scope?
  -What is the main objective, and how this objective can be divided into sub-objectives of the project?
  -What is the innovation/contribution of the project?

Chapter 4: Methods/Technologies Involved
- o A brief statement of the methodology for the realization of the project. It could define the general approach to how the project and its output(s) will be realized. Discussions should include:
  -What are the proposed methods/technologies involved in the solutions?

Item No.	Arrangement	Content
		-How to justify the objective/sub-objectives can be achieved with these methods/technologies.
8	Bibliography	Refer to Appendix F. It should list all the reference materials used for the project.
9	Appendices	The appendices are supplementary materials that are too lengthy to be included or may not suite well in the main part of your document. The following is a guideline on the arrangement of appendices and what may be included as part of the appendices. - Specifications, data sheets and drawings of equipment or components used. - Data used for analysis. - Survey sheets. - Charts and data tables. - Lengthy mathematical derivations. - etc.

4.2 Report Contents and Arrangement Guidelines for Project I

The essential components of the content of the final year project proposal should include the items listed below. They should also be arranged in the top-down order as listed. The proposal usually should not exceed 30 pages.

Item No.	Arrangement of the Proposal	Content
10	Title Page	1 page. Refer to Appendix E.
11	Abstract	Maximum 1 page. Usually it is limited to between 200 and 300 words. Refer to Appendix E. It should describe the format / outline of the proposal. Abstract is a formal summary of your completed work: • Abstract, like summary, the main points of a piece of writing that includes the field of study, problem definition, methodology adopted, research process, conclusion and planning of the project work, etc. • Unlike executive summaries written for non-specialist audiences, abstracts use the same level of technical language and expertise found in the article itself. Abstract typically serves the following goals: • Help readers decide if they should read an entire article.

		• Help readers to see your key findings and achievement of your project. • Help readers understand your project by acting as a pre-reading outline of key points. • Help readers to review technical work without becoming bogged down in details.
12	Table of Contents	Refer to Appendix E. It should list all the chapters and their corresponding sections and subsections found in the report.
13	List of Tables	Refer to Appendix E. It should list all the tables and their corresponding page numbers found in the report.
14	List of Figures	Refer to Appendix E. It should list all the figures and their corresponding page numbers found in the report.
15	List of Symbols	Refer to Appendix E. It should list all the symbols found in the report and their corresponding meanings.
16	List of Abbreviations	Refer to Appendix E. It should list all the abbreviations found in the report and their corresponding meanings.

17	Sectioning	Number of pages should be between 20 to 30 pages. Students should familiarize themselves with report writing skills such as division of work and report sectioning. Each chapter should begin on a new page. Within a chapter, use as many sections and subsections as possible and where appropriate. Subsection is limited to 3 levels only.
		
		Chapter 1: Introduction
		• Motivation and Problem Statement (1 to 2 paragraphs)
		   o It should be short and concise, emphasizes on overview of problems and the motivation of the whole project. At the very minimum, students should present a summary of the problem and the problem domain of the project.
		
		   o You need to justify the existence of your project. Problem statement - state the existing problem to be solved. Motivation - why you want to solve it, why the project is needed? Writing up on problem statement and motivation: you would like to solve some problems. You would like to improve something. You would like to develop something that does not existed or carry out enhancement on an existing work. Example: You would like to develop a voice recognition software, because the software does not exist. Or, you improve on an existing voice

| | | recognition software because the software often misinterprets some words. |
| | | o Common mistake: students normally confuse problem statement (or motivation) with technical difficulties. |

• Project Scope (1-2 paragraph)
  o Describe what you are going to deliver at the end of the project. (e.g. a piece of software, a piece of hardware, an improvement plan of a system, a development framework, a research survey, a model of a system, or simulation result, etc). Give a general overview of your solution of the problem.

  o Example: This project develops a model on the social behavior of Internet with various simulation results on some scenarios. This project involves a new algorithm design to speed up the grid computing.

• Project Objectives (1-4 paragraph)
  o Describe the purpose and aims of the project which give more detailed information than the project scope.

  o For example: The project aims to improve at least 10% in processing performance over the current Sun Solaris grid computing engine with our new algorithm.

  o The following questions are applicable:
  - What in general will this project try to achieve?
  - What will this project focus on?
  - What IS NOT covered by this project?

  o Common mistakes:
  - Stating learning objectives instead of project objectives. For example, learning programming languages, tools etc.
  - Treating project timelines as project objectives.

• Impact, significance and contribution (1-2 paragraph)

			o	Describe how the project is going to benefit the readers or anybody.
			o	Describe the reasons for solving the problems mentioned in the problem statement.
			o	Why are the problem and solution of your project interesting?
			o	Why is your project worth your readers' time to read it?
			o	Make your readers feel that your project is important or "desirable".
			o	This is where you need to "sell" or "promote" your project.
			o	For example: By having this educational software, the student will visualize better on how the processor works.
			o	For example: This survey has to be carried out because it will form the basis to anticipate and project the market trend ahead of time.
			•	Background information (> 3 paragraphs)
			o	A brief section giving background information may be necessary, especially if your work spans two or more traditional fields.
			o	Give a descriptive view on the field (or sub-field) of the project and historical development prior to the project.
			o	Give your readers who may not have any experience with some of the material needed to follow your project.
			o	It may be a good practice to give some definition of some key terms, or impart some key technical knowledge to the readers at this point.
			o	The ultimate question: What my readers, especially those who are not the same field as

I do, need to know before they continue to read the rest of the document?

Chapter 2: Literature Review
- Literature Review
  - Highlight what is the current practice or prior arts towards the problem. It can be structured or non-structured (for unexplored areas)

  - If there are prior arts, students should refer or cite them and include the referenced art in the references section.

- Fact Finding (if the nature of the study needs this analysis)
  - Scientific method to do fact finding and analysis - reviewing existing manuals and procedures, preparing questionnaires, observations, research and conducting personal interviews.

  - Accomplished by techniques such as data element analysis; input-output analysis, including flow diagrams; recurring data analysis; and report use analysis.

- Data Collection (if the nature of the study needs this analysis)
  - Collect relevant data and documents to justify the problems and need for solutions

- Critical Remarks of previous works
  - Describe the strength and weakness of any previous work that are similar to your project

  - Compare them with your proposed solutions.

Chapter 3: Proposed Method/Approach
- Design Specifications
  - Methodologies and General Work Procedures

    A brief statement (1 to 2 paragraphs) of the methodology for the realization of the project. It could define the general approach to how the project and its output(s) will be realized. Show diagrams if they can help you to explain.
  - Tools to use.

- User requirements (if there is any)
- System Performance Definition: targeted improvements like accuracy, timing, etc.
- Verification Plan: types of inputs to test, etc.

- System Design / Overview
  - All development projects should have this section which describes in some detail how the project is designed.
  - Give top-down system design diagrams (i.e. system flowchart, design block diagram, etc.) if applicable. Explain what is the functionality (and any other detail) of each block in diagrams.
  - For example, if your project is about writing an Android application for time management, then you should mention about the system flow diagram, how your program is written, such as the classes and methods used in the program, the database for keeping information, such as the SQL for creating the database, how to compile the program, and how to upload the program to a phone.
  - Another example is if you are building a moving robot, then you should mention how the physical robot is built, the parts or components required, mention about the design of your program that controls the robot, how to program the microcontroller, such as the steps to compile and upload the program to the microcontroller, how the sensors, servos, wires are connected, provide a schematic diagram that illustrates the connection of all the components, and how to operate the robot.

- Implementation Issues and Challenges (1-2 paragraphs)
  - Difficult issues and challenges in the implementation.
  - Novel aspects of this project (if any)

- Timeline (1 paragraph)
  - Estimated timeline for deliverables and milestones
  - Graphical - Gantt chart format
  - Planning for current semester and next semester.

Item No.	Arrangement of the Report	Content
		Chapter 4: Conclusion (usually 1 page)
		o Summarize the project including the problem, motivation, and proposed solutions.
		o Highlight any derived novel idea if there is any.
		o No new ideas or information in the conclusion, i.e. they should have been mentioned in other chapters.
18	Bibliography	Refer to Appendix F. It should list all the reference materials used for the project.

19	Appendices	The appendices are supplementary materials that are too lengthy to be included or may not suite well in the main part of your document.
		
		The following is a guideline on the arrangement of appendices and what may be included as part of the appendices.
		
		  - Specifications, data sheets and drawings of equipment or components used.
		  - Data used for analysis.
		  - Survey sheets.
		  - Charts and data tables.
		  - Lengthy mathematical derivations.
		  - etc.

4.3   Report Contents and Arrangement Guidelines for Project II

The essential components of the content of the final year project report should include the items listed below. They should also be arranged in the top-down order as listed. The report should comprise between 20,000 – 40,000 words.

Item No.	Arrangement of the Report	Content
1	Front Cover	Same content as the Title Page. Please refer to Appendix D for the report format. The format (font type, size, capitalization and the sentences arrangement) must be strictly adhered to. No changes to the report format are allowed. **It is the responsibility of the students to remind the**

		photocopy vendors to adhere to the format stated when binding. Any discrepancy will result in the rejection of the report and thereafter the student will have to re-bind on his/her own expense.
2	Report Status Declaration Form	1 page. Refer to Appendix E.
3	Title Page	1 page. Refer to Appendix E.
4	Declaration of Originality	1 page. Refer to Appendix E.
5	Acknowledgements	1 page. Refer to Appendix E.
6	Abstract	Maximum 1 page. Usually it is limited to between 200 and 300 words. Refer to Appendix E. It should states the field of study, problem definition, methodology and techniques adopted, research process, results obtained and conclusion of the project work. Highlight the novelties if there is any.
7	Table of Contents	Refer to Appendix E. It should list all the chapters and their corresponding sections and subsections found in the report.
8	List of Figures	Refer to Appendix E. It should list all the figures and their corresponding page numbers found in the report.
9	List of Tables	Refer to Appendix E. It should list all the tables and their corresponding page numbers found in the report.
10	List of Symbols	Refer to Appendix E. It should list all the symbols found in the report and their corresponding meanings.
11	List of Abbreviations	Refer to Appendix E. It should list all the abbreviations found in the report and their corresponding meanings.

12	Chapters	Each chapter should begin on a new page. Within a chapter, separate the information pertaining to the chapter into sections and subsections. The following is a general guideline on the arrangement of chapters and what to be included as part of each chapter.
		
		Chapter 1: Introduction
		    - Problem statement.
		    - Background and motivation.
		    - Objectives.
		    - Proposed approach/study (provide system flowchart if any)
		    - Highlight of what have been achieved.
		    - Report organization.
		Chapter 2: Literature Review
		    - Review and comparison of previous work.
		    - Highlight and compare proposed study with previous work.

Chapter 3: System Design
- All development projects should have this chapter. This chapter describes in detail how the project is developed. One thing to keep in mind when writing this chapter is to provide all the necessary information for someone who reads this chapter could rebuild your system.
- Give top-down system design diagrams (i.e. system flowchart, design block diagram, etc.). Explain what is the functionality (and any other detail) of each block in diagrams.
- For example, if your project is about writing an Android application for time management, then you should mention about the system flow diagram, how your program is written, such as the classes and methods used in the program, the database for keeping information, such as the SQL for creating the database, how to compile the program, and how to upload the program to a phone.
- Another example is if you are building a moving robot, then you should mention how the physical robot is built, the parts or components required, mention about the design of your program that controls the robot, how to program the microcontroller, such as the steps to compile and upload the program to the microcontroller, how the sensors, servos, wires are connected, provide a schematic diagram that illustrates the connection of all the components, and how to operate the robot.

Chapter: 4, 5 (or more chapters; dedicate one chapter for each of the important bocks of information in the flowchart described in chapter 3)
 - Methodology and tools
 - Requirement
 - Specification: Analysis, Design and Verification Plan
 - Implementation and Testing.

Chapter 6: Conclusion
 - Project Review, Discussions and Conclusions: what has been achieved, relate to Objectives, problems encountered, personal insight into the total research experience
 - Highlight any novelties and contributions the project has achieved.
 - Future Work: indicate improvements / further

		developments that can be made.
13	Bibliography	Refer to Appendix F. It should list all the reference materials used for the project.

14	Appendices	The appendices are supplementary materials that are too lengthy to be included or may not suite well in the main part of your document.
		
		The following is a guideline on the arrangement of appendices and what may be included as part of the appendices.
		
		  - Specifications, data sheets and drawings of equipment or components used.
		  - Data used for analysis.
		  - Survey sheets.
		  - Charts and data tables.
		  - Lengthy mathematical derivations.
		  - etc.

4.4 Poster Content and Arrangement Guidelines for Project I and Project II

The essential components of the content of the poster report should include the items listed as follow:

Item No.	Poster Presentation	Content
1	Size	A1 paper
2	Font	Use contrasting fonts for the title, text and figure legends. (Ensure the font size used are large enough)
3	Required Elements	- You may use photos, figures, and table - Determine a logical sequence for the material you will be presenting. - Organize that material into sections, e.g., Introduction, Methods, Results, Discussion, and Conclusions. - Arrange the material into columns.
4	File Type	Softcopy, save the softcopy in any of the following format: JPEG / TIFF / BMP / EPS.

5 Project Report Format

5.1 Report Format for Introduction to Inventive Problem Solving and Proposal Writing / Project I

The report should be written using the third person and in the past tense. For example, do not use "I" and "you" in the report.

- Font
  - Times New Roman, 12 points, 1.5 line spacing applies to figure caption, table caption, chapter headings, subheadings, and citations.
  - Exceptions:
    Header, Footer, Footnote, Words in Figure/Table, font size should be within 10 to 11 points.
  - Colour: black.
  - Citing references in text: refer to the citation style "Harvard Style Referencing" in Appendix F.

- Language
  - British English

- Printing
  - Single side.

- Paper
  - A4 size, 80g paper.

- Header
  - Align left: chapter number and title.

- Footer
  - Align right: page number.
  - The following is to be aligned left:
    BIS (Hons) Information Systems Engineering
    Faculty of Information and Communication Technology (Perak Campus), UTAR.

- Page Number
  - Align right at the Footer.
  - Title, Abstract, Table of Contents and Listing – pages are numbered using small Roman numeric (i, ii, iii, etc). Note even though the Title Page is numbered i, the number is not to be printed on the page.
  - Chapters and Bibliography – pages are numbered 1, 2, 3, etc.

- Appendices – pages are numbered A-1, A-2, etc for Appendix A, B-1, B-2, etc for Appendix B and etc.

- Margins
  - Left (1.5 inches, except the front cover 1.2 inches)
  - Right (1 inch)
  - Header/Footer (0.5/0.4 inch)
  - Top/Bottom (1 inch)

- Title Page (refer to Appendix E)
  - Do not include UTAR logo.
  - The font used is Times New Roman 12.
  - Note the format (font type, size, capitalization and the sentences arrangement) of the Title Page in Appendix E must be strictly adhere to. Change the word "REPORT" to "PROPOSAL".

- Table of Contents (refer to Appendix E)

- Tables/Figures (refer to Appendix E)
  - Should include table (figure) caption immediately below the table (figure).
  - Number the tables and figures sequentially, with respect to the chapter or section of a chapter. To be consistent, use either one format, not both.
  - For example, Table 2-2 is the second table of chapter 2.
  - For example, Table 4-2-6 is the sixth table of section 2 of chapter 4

- Citation
  - Use Harvard standard citation (please refer to Appendix F).

- Bibliography
  - Use Harvard standard citation (please refer to Appendix F).
  .
- Binding
  - Must be comb-bound.

- Softcopy (for Project 1 report only)
  - **TWO (2)** softcopy of reports should be submitted in CD/DVD which containing the following:
    - The proposal report is required to be saved in PDF format only and save in 1(one) PDF file, no separate files for different sections of FYP and dissertation/thesis are allowed
    - Attachments to the report such as complete executable program, set-up/installation guide, and source code of program (or system and data files, art works, etc.) in various file formats must be compressed and zipped into **ONE (1)** zipped file.
  - The CD/DVD should be submitted in a CD/DVD casing with appropriate labeling. The CD/DVD should be attached at the back of the report.

– The "Session" should refer to the session of the FYP1

    e.g. FYP1 registered during session May 2011 – "Session: May 2011"

Labelling for CD/DVD:

Name:
ID:
Project Title:
Supervisor:
Degree Program:
Faculty:
Session:

5.2   Report Format for Project II

The report should be written using the third person and in the past tense. For example, do not use "I" or "you" in the report.

- Font
  - Times New Roman, 12 points, 1.5 line spacing.
  - Applies to ALL, including figure caption, table caption, chapter headings, subheadings, and citations.
  - Exceptions:
    Header, Footer, Footnote, Words in Figure/Table, font size should be within 10 to 11 points.
  - Colour: black.
  - Citing references in text: refer to the citation style "Harvard Style Referencing" in Appendix F.

- Language
  - British English

- Printing
  - Single side.

- Paper
  - A4 size, 80g paper.

- Header
  - Align left: chapter number and title.

- Footer
  - Align right: page number.

- The following is to be aligned left:
    BIS (Hons) Information Systems Engineering
    Faculty of Information and Communication Technology (Perak Campus), UTAR

- Page Number
  - Align right at the Footer.
  - Title, Declaration of Originality, Acknowledgements, Abstract, Table of Contents and Listing – pages are numbered using small Roman numeric (i, ii, iii, etc). Note even though the Title Page is numbered i, the number is not to be printed on the page.
  - Chapters and Bibliography – pages are numbered 1, 2, 3, etc.
  - Appendices – pages are numbered A-1, A-2, etc for Appendix A, B-1, B-2, etc for Appendix B and etc.

- Margins
  - Left (1.5 inches) except the Front Cover (1.2 inches)
  - Right (1 inch)
  - Header/Footer (0.5/0.4 inch)
  - Top/Bottom (1 inch)

- Front Cover (refer to Appendix D)
  - Content same as the Title Page.
  - Do not include UTAR logo.
  - The font used is Times New Roman 12.
  - Note the format (font type, size, capitalization and the sentences arrangement) must be strictly adhere to. No changes are allowed.

- Table of Contents (refer to Appendix E)

- Tables/Figures (refer to Appendix E)
  - Should include table (figure) caption immediately below the table (figure).
  - Number the tables and figures sequentially, with respect to the chapter or section of a chapter. To be consistent, use either one format, not both.
  - For example, Table 2-2 is the second table of chapter 2.
  - For example, Table 4-2-6 is the sixth table of section 2 of chapter 4

- Citation
  – Use Harvard standard citation (please refer to Appendix F).

- Bibliography
  – Use Harvard standard citation (please refer to Appendix F).

- Binding
  – The title page should be put immediately after the front cover.

- Softcopy

– **TWO (2)** softcopy of reports should be submitted in CD/DVD which containing the following: The FYP or dissertation/thesis is required to be saved in PDF format only and save in 1(one) PDF file, no separate files for different sections of FYP and dissertation/thesis are allowed.

- Attachments to the FYP or dissertation/thesis such as complete executable program, set-up/installation guide, and source code of program (or system and data files, art works, etc.) in various file formats must be compressed and zipped into **ONE (1)** zipped file.
- **The file naming format should be Course Code - Year of Submission - Student ID - Copy No (eg. BA-2010-1007640-1)**

– The CD/DVD should be submitted in a CD/DVD casing/pocket with appropriate labeling. The CD/DVD should be attached at the back of the dissertation report.

– The "Session" should refer to the session of the FYP2

e.g. FYP2 registered during session January 2012 – "Session: January 2012"

Labelling for CD/DVD:

```
Name:
ID:
Project Title:
Supervisor:
Degree Program:
Faculty:
Session:
```

– After students have successfully completed their oral presentation and product demonstration, students are required to submit a FINALIZED copy of their CD to the FGO

5.3 Other Points to Note on Writing Report

1. A thesis should be written according to the intended group of reader. It should be in a logic form with strong explanation to convince the reader on the conclusion of the thesis. It should be written in good language and easy to understand. Any technical language or daily language should be avoided. As far as possible, all statements must be supported by facts, numbers, and data.

2. The writer should be able to defend all statements by referring to a reliable research or research findings.

3. Symbols or nomenclature used should be defined. Standard symbols or acronym normally accepted in engineering field can be used. International System Unit

(S.I) should be used. If you use other units, SI equivalent unit should be in bracket.

4. Equations and formulae should be typed and in Italic. Avoid ambiguous equation that has alternative interpretations; for example:

$(y/x) = ax + b$ is preferred compared to:

$y/x = ax + b$

5. Diagram can include graphs and figures. Diagrams should be easy to understand.

   i.   Every diagram should have relevant title and should be numbered using the Arabic number at the bottom (if possible different for each chapter).
   ii. Coordinate units (abscissa) should be written clearly in the graph.
   iii. All the data points and lines should be clear - generally it should not be more than 2 or 3 curves in every diagram
   iv. Types of different data points must be shown in a legend.
   v.   Every diagram should be referred and elaborated in the text.
   vi. The gridlines should be in appropriate intervals.

6 Viva: Oral Presentation and Project Demonstration

This exercise is intended to assess the students' ability to deliver a technical presentation as a result of their project investigation. The Oral Presentation is attended and assessed by the Supervisor and Moderator.

The presentation should describe the aim of the project, an outline of the presentation, the results obtained and the extent to which the goals of the project are met. The time allocated for the presentation session is 15 to 20 minutes and an additional 10 minutes for the 'Question and Answer' session.

The project demonstration session can be arranged to be the subsequent session to the oral presentation session for effective assessment. Otherwise, the demonstration may be arranged separately. The time allocated for the demonstration session is not more than 30 minutes.

7 FYP Guidelines for Supervisor and Moderators

Guidelines for Supervisor

The Project Student conducts his/her work under the direction of the Project Supervisor. The Supervisor can be a qualified internal academic faculty staff or someone qualified external to the faculty. In the case of external supervisor, an internal supervisor will be attached to the project to act as the moderator.

The Supervisor's role is to stimulate discussion and indicate the various avenues of approach and resources available. Although the Supervisor may serve as a guide and mentor for the project, it is emphasized that the ultimate responsibility for the project lies with the students.

Purchase of special components or equipment requires prior consent from the Supervisor, who acts as the 'budget controller' due to the limited funds available.

The Supervisor will evaluate the biweekly report, the project proposal, the full report, the oral presentation and product demonstration.
If the student could not manage to meet the supervisor in 4 consecutive weeks, the lecturer will have to contact the student to find out the current status of the student, and report the situation to the Final Year Project committee.

Guidelines for Moderators

Moderator is member of staff whose function is to ensure a uniform standard of assessment is applied to each project.

Moderation will take place at two stages:
- An assigned Moderator will evaluate the oral presentation and product demonstration. The moderation forms are available in the faculty's shared drive.

Appendices

Appendix A: Final Year Project Titles List

Go to: http://www.utar.edu.my/fict-pk/   ⇒ Student Portal   ⇒ Final Year Project

Appendix B: Final Year Project Registration Form

FINAL YEAR PROJECT REGISTRATION FORM

(Project I / Project II)

I hereby affirm that the originality and authenticity of the Final Year Project to be undertaken will be upheld. The report and/ or the system that I submit at the conclusion of the Final Year Project will be the result of my own investigations and effort.

I understand that cheating and plagiarism constitute a serious violation of the university regulations, which will not only result in a failing grade for the Final Year Project but subject me to further disciplinary actions.

Signature of Student:

_____

Name:
Date:

Student Name :
Student ID   :
Contact No   :
Email Address:
Course   :
Year of Study :

Area of Study   :
Proposed Project Title :

Signature of Supervisor:

_____

Name:
Date

Appendix C: Final Year Project Biweekly Report

FINAL YEAR PROJECT WEEKLY REPORT
(Project I / Project II)

Trimester, Year:	**Study week no.:**
Student Name & ID:	
Supervisor:	
Project Title:	

1. WORK DONE
[Please write the details of the work done in the last fortnight.]

2. WORK TO BE DONE

3. PROBLEMS ENCOUNTERED

4. SELF EVALUATION OF THE PROGRESS

_____

Supervisor's signature   Student's signature

Appendix D: Report Front Cover

2 inches from the top

ONLINE B2B AND B2C PURCHASING
BY

ANTHONY CHAN MING WAI
(REFER NEXT PAGE FOR MARGIN)

A REPORT

SUBMITTED TO

Universiti Tunku Abdul Rahman

in partial fulfillment of the requirements

for the degree of

BACHELOR OF COMPUTER SCIENCE (HONS)

Faculty of Information and Communication Technology
(Perak Campus)

MAY 2014

2 inches from the bottom

Appendix E: Sample of Report Arrangement

REPORT STATUS DECLARATION FORM

Title: _____

_____

_____

Academic Session: _____

I   _____

(CAPITAL LETTER)

declare that I allow this Final Year Project Report to be kept in

Universiti Tunku Abdul Rahman Library subject to the regulations as follows:

1. The dissertation is a property of the Library.

2. The Library is allowed to make copies of this dissertation for academic purposes.

Verified by,

_____   _____

(Author's signature)   (Supervisor's signature)

Address:

_____

_____   _____

_____   Supervisor's name

Date: _____   **Date**: _____

ONLINE B2B AND B2C PURCHASING

By

Anthony Chan Ming Wai

A REPORT

SUBMITTED TO

Universiti Tunku Abdul Rahman

in partial fulfillment of the requirements

for the degree of

BACHELOR OF INFORMATION TECHNOLOGY (HONS)

COMPUTER ENGINEERING

Faculty of Information and Communication Technology
(Perak Campus)

MAY 2014

DECLARATION OF ORIGINALITY

I declare that this report entitled "**METHODOLOGY, CONCEPT AND DESIGN OF A 2-MICRON CMOS DIGITAL BASED TEACHING CHIP USING FULL-CUSTOM DESIGN STYLE**" is my own work except as cited in the references. The report has not been accepted for any degree and is not being submitted concurrently in candidature for any degree or other award.

Signature : _____

Name   : _____

Date   : _____

ACKNOWLEDGEMENTS

I would like to express my sincere thanks and appreciation to my supervisors, Dr. B.M. Armstrong and Dr. G.A. Armstrong who has given me this bright opportunity to engage in an IC design project. It is my first step to establish a career in IC design field. A million thanks to you.

To a very special person in my life, Stephanie Yuen, for her patience, unconditional support and love, and for standing by my side during hard times. Finally, I must say thanks to my parents and my family for their love, support and continuous encouragement throughout the course.

ABSTRACTS

This project is an IC design project for academic purpose. It will provide students with the methodology, concept and design of digital integrated circuit. This will be illustrated through the construction of a Teaching Chip. Since CMOS technology is well suited for digital circuits, it is therefore implemented in the project. From the design point of view, emphasis is laid on the IC design flow. A flow exists due to the fact that IC design business involves integrating four diverse major areas namely device operation, circuit analysis and design, circuit simulation and lastly, physical layout and re-simulation. Emphasis is also made on the importance of an EDA tool; how it is incorporated into the design flow and aids IC design jobs. The tool used in this project is the Tanner Tools. There are several styles to design integrated circuit and the one used here is the full-custom design style. In the area of device operation and circuit analysis/design, the circuit design job involves hand calculation for DC and transient design. These include designing the logic threshold voltage and propagation delay time of the circuit according to specification. Three common methods, Average-Current, Differential Equation and Digital Model are reviewed for their suitability in delay time hand calculation. Since hand calculation only presents an approximated circuit design, computer simulation is compulsory to verify the design. In the area of circuit simulation, SPICE MOSFET Level 2 model is used due to its suitability for teaching. Thus, at minimum, 2.0 micron CMOS is chosen. Beyond 2.0 micron, more complicated SPICE MOSFET model is required for simulation and is therefore avoided. Suitable CMOS processes are reviewed and consequently, MOSIS/Orbit 2.0 micron process is chosen. In the areas of physical layout and re-simulation, the designed circuit was laid out, design rule check was performed on the layout followed by layout extraction to obtain the equivalent SPICE netlist for re-simulation. The re-simulation includes the effect of parasitic capacitance and resistance, which are not included in the earlier circuit design. Re-simulation is necessary since parasitic affects the transient characteristics. Lastly, suitable digital circuits for teaching will be designed and packed onto the Teaching Chip. Examples include inverter, ring oscillator, NAND, NOR, static CMOS, etc.

The output material of the project would be SPICE programs, DC and transient simulation results, cell level, block level and chip level layouts.

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LIST OF FIGURES

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LIST OF ABBREVIATIONS

CMOS	Complementary Metal Oxide Semiconductor
MOSFET	Metal Oxide Semiconductor Field Effect Transistor
IC	Integrated Circuit
DRC	Design Rule Checker
SCNA	Scalable CMOS N-Well Analog
ASIC	Application Specific Integrated Circuit
HDL	Hardware Description Language

Appendix F: Harvard Style Referencing

How To Cite References - Harvard Style

Contents

Getting started

There are two components to referencing: citations in your paper and the reference list at the end of your paper.

Example of Citation within the Text:

Harvard is an 'author/date' system, so your citation consists of author(s) and year of publication.

Citation of a book (the same format applies for a journal article)
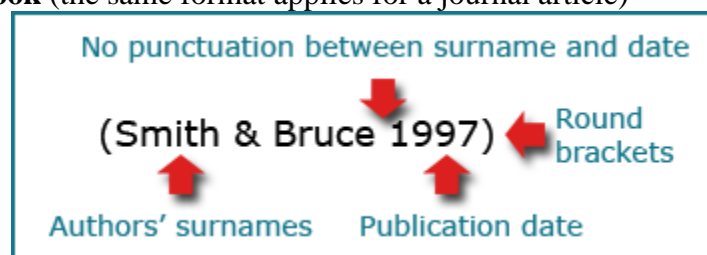
If you quote directly from an author or to cite a specific idea or piece of information from the source you need to include the page number of the quote in your citation.
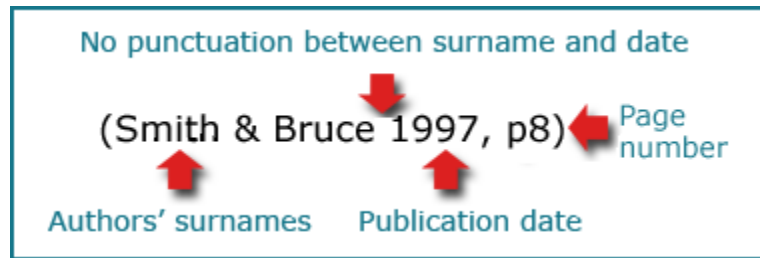
The reference list:
All citations should be listed in the reference list at the end of your document.

Reference list entry for a book
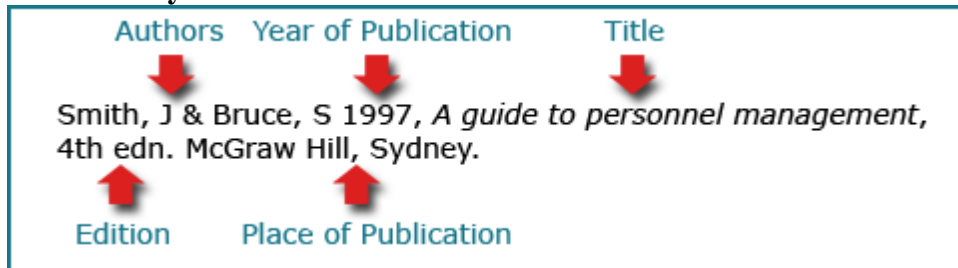
Reference list entry for a journal

Reference list entries contain all the information that someone needs to follow up your source. Reference lists in Harvard are arranged alphabetically by author.

Citation within the Text and Reference List Examples

Books & eBooks

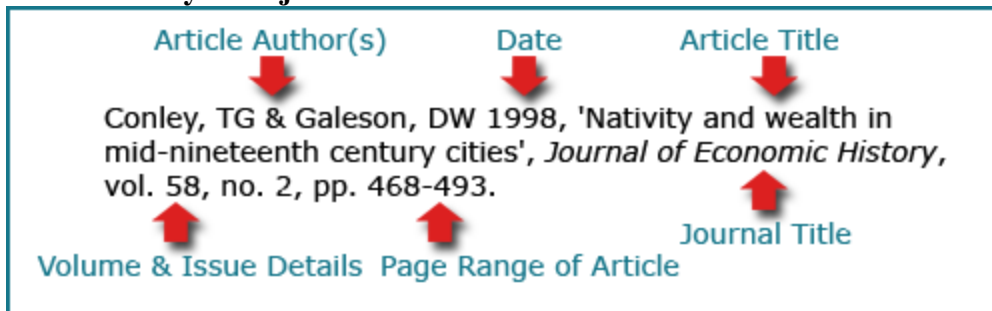| Material Type	Example of Citation within the Text	Reference List Example
Book: Single Author	(Holt 1997) or Holt (1997) wrote that...	Holt, DH 1997, *Management principles and practices*, Prentice-Hall, Sydney.
Book: 2 or 3 Authors	(McCarthy, William & Pascale 1997)	McCarthey, EJ, William, DP & Pascale, GQ 1997, *Basic marketing*, Irwin, Sydney.
Book: More Than 3 Authors	(Bond et al. 1996)	Bond, WR, Smith, JT, Brown, KL & George, M 1996, *Management of small firms*, McGraw-Hill, Sydney.
Book: No Author	(A history of Greece 1994)	*A history of Greece* 1994, Irwin, Sydney.
Book: Editor	(ed. Jones 1998)	Jones, MD (ed.) 1998, *Management in Australia*, Academic Press, London.
Book: 2 or More Editors	(eds Bullinger & Warnecke 1985)	Bullinger, HJ & Warnecke HJ (eds) 1985, *Toward the factory of the future*, Springer-Verlag, Berlin.
Book: Translator & Author	(trans. Smith 2006)	Colorado, JA 2006, *Economic theory in the Mexican context: recent developments on the ground,* trans. K Smith, Oxford University Press, Oxford.
Book: Organisation as Author	(Australian Bureau of Agricultural and Resource Economics 2001)	Australian Bureau of Agricultural and Resource Economics 2001, *Aquaculture development in Australia: a review of key economic issues*, ABARE, Canberra.
Book: Chapter or Article in Edited Book	A number of disturbing facts intrude' (Milkman 1998, p. 25)	Milkman, R 1998, 'The new American workplace:high road or low road?' in *Workplaces of the future*, eds P Thompson & C Warhurst, Macmillan Press, London, pp. 22-34.
Book, edition other than first.	(Drafke, 2009)	Drafke, M 2009, *The human side of organizations*, 10th edn, Pearson/Prentice Hall, Upper Saddle River, N.J
E-book	(Aghion & Durlauf 2005)	Aghion, P & Durlauf, S (eds.) 2005, *Handbook of economic growth*, Elsevier, Amsterdam. Available from: Elsevier books. [4 November 2004].
E-book: Chapter or Article in an Edited E-book	'Historical thinking is actually a Western perspective' (White 2002, p. 112)	White, H 2002, 'The westernization of world history' in *Western historical thinking: an intercultural debate*, ed J Rusen, Berghahn Books, New York pp. 111-119. Available from: ACLS Humanities E-Book. [14 May 2009].
Book: Different Works by Same Author in	(Bond 1991a) (Bond 1991b)	Bond, G 1991a, *Business ethics*, McGraw-Hill, Sydney.

Same Year		Bond, G 1991b, *Corporate governance*, Irwin, London.

Journal Articles

Material Type	Example of Citation within the Text	Reference List Example
Journal Article: Print	(Conley & Galeson 1998)	Conley, TG & Galeson, DW 1998, 'Nativity and wealth in mid-nineteenth century cities',*Journal of Economic History*, vol. 58, no. 2, pp. 468-493.
Journal Article: Electronic Database	(Liveris 2011)	Liveris, A 2011, 'Ethics as a strategy', *Leadership Excellence*, vol. 28, no. 2, pp.17-18. Available from: Proquest [23 June 2011].

Internet/Websites

Material Type	Example of Citation within the Text	Reference List Example
Webpage: No Author	(Improve indigenous housing 2007) *Use first few words of the page title*	*Improve indigenous housing now, government told, 2007.* Available from: <http://www.architecture.com.au/i-cms?page=10220> . [8 February 2009].
Webpage: No Date	(Jones, n.d.)	Jones, MD n.d., *Commentary on indigenous housing initiatives*. Available from: <http://www.architecture.com.au>. [6 June 2009].
Web Document	(Department of Industry, Tourism and Resources 2006)	Department of Industry, Tourism and Resources 2006, *Being Prepared for an Influenza Pandemic: a Kit for Small Businesses*, Government of Australia, Available from: <http://www.innovation.gov.au>. [28 February 2009].
Website	(Australian Securities Exchange 2009)	Australian Securities Exchange 2009, *Market Information*. Available from: <http://www.asx.com.au/professionals/market_information/index.htm>. [5 July 2009].
Blog	(Newton 2007)	Newton, A. 2007, Newcastle toolkit. 16 January 2007. *Angela Newton: Blog*. Available from: <https://elgg.leeds.ac.uk/libajn/weblog/>. [23 February 2007].
Computer Software	(OpenOffice.org 2005)	OpenOffice.org, computer software 2005. Available from:

| | | <http://www.openoffice.org>. [11 January 2005]. |

| Web Based Image / table / figure | (The Lunar Interior 2000) | *The Lunar Interior*, 2000. Available from: <http://www.planetscapes.com/solar/browse/moon/moonint.jpg>. [28 November 2000]. |

Cases and Legislation

Material Type	Example of Citation within the Text	Reference List Example
Cases	(*R v Tang (2008)* 237 CLR 1)	*R v Tang* (2008) 237 CLR.
Acts of Parliament	(*Corporations Act 2001* (Cth) s 3)	*Corporations Act 2001* (Cth).
Delegated Legislation	(*Police Regulations 2003* (Vic) reg 6.	*Police Regulations 2003* (Vic) reg 6.
Bills	(Corporations Amendment Bill (No 1) 2005 (Cth)	Corporations Amendment Bill (No 1) 2005 (Cth).

Company Information

Material Type	Example of Citation within the Text	Reference List Example
Company Report	(Aspect Huntley 2009)	Aspect Huntley DatAnalysis 2009, *National Australia Bank Limited Company Report*. Available from: Aspect Huntley DatAnalysis. [20 May 2009].
Company Profile	(Datamonitor 2009)	Datamonitor 2009, *Wesfarmers Limited Company Profile*. Available from: Business Source Premier. [20 May 2009].
Financial Data	(Datastream 2009)	Datastream, 2009, *S&PASX200 daily index data 2000-2009*. Available from: Datastream. [20 May 2009].

Conference Papers & Proceedings

Material Type	Example of Citation within the Text	Reference List Example
Conference Proceeding Paper: Print	(Riley 1992)	Riley, D 1992, 'Industrial relations in Australian education', in Contemporary Australasian industrial relations: *proceedings of the sixth AIRAANZ conference*, ed. D. Blackmur, AIRAANZ, Sydney, pp. 124-140.

Material Type	Example of Citation within the Text	Reference List Example
Conference Proceeding Paper: Electronic	(Fan, Gordon & Pathak 2000)	Fan, W, Gordon, MD & Pathak, R 2000, 'Personalization of search engine services for effective retrieval and knowledge management', *Proceedings of the twenty-first international conference on information systems*, pp. 20-34. Available from: ACM Portal: ACM Digital Library. [24 June 2004].
Conference Proceeding Paper: Unpublished	(Brown & Caste 1990)	Brown, S & Caste, V 2004, 'Integrated obstacle detection framework'. Paper presented at the *IEEE Intelligent Vehicles Symposium*, IEEE, Detroit MI.

Newspapers

Material Type	Example of Citation within the Text	Reference List Example
Newspaper: Print	(Ionesco 2001)	Ionesco, J 2001, 'Federal election: new Chip in politics', *The Advertiser* 23 October, p. 10.
Newspaper: Electronic Database	(Meryment 2006)	Meryment, E 2006, 'Distaff winemakers raise a glass of their own to their own', *The Australian*, 7 October, p. 5. Available from: Factiva. [2 February 2007].
Newspaper: From a Website	(Hilts 1999)	Hilts, PJ 1999, 'In forcasting their emotions, most people flunk out', *The New York Times* 16 February. Available from <http://www.nytimes.com>. [19 February 2000].
Newspaper: No Author	(*The Sydney Morning Herald* 7 January 2011, p. 12)	Not required.

Multimedia

Material Type	Example of Citation within the Text	Reference List Example
Video	(Effective performance appraisals 1994)	*Effective performance appraisals* 1994, (video recording), Melbourne, Educational Media Australia.
Television Programme	(Crystal 1993)	Crystal, L (executive producer) 1993, *The MacNeil/Lehrer news hour* (television broadcast) 11 October 1993, New York and Washington DC, Public Broadcasting Service.
Audio Podcast	(Van Nuys 2007)	Van Nuys, D (producer) 2007, 'The anatomy of a lobotomist [Show 84]', *Shrink*

		Rap Radio(podcast). Available from: <http://www.shrinkrapradio.com/>. [11 April 2007].
Video Podcast	(Kloft 2006)	Kloft, M (producer/director) 2006, The Nuremberg trials (motion picture), in M.Sameuls (executive producer), *American experience* (podcast). Available from: <http://www.pbs.org/wgbh/amex/rss/podcast_pb.xml>. [4 March 2006].
Music Track from an Album	(Shocked 1992)	Shocked, M 1992, 'Over the waterfall', on *Arkansas Traveller* (CD). New York, Polygram Music.
Video Blog Post	(Norton 2006)	Norton, R 2006, 'How to train a cat to operate a light switch' (video file). Available from: <http://www.youtube.com/watch?v=Vja83 KLQXZs>. [4 November 2006].

Standards & Patents

Material Type	Example of Citation within the Text	Reference List Example
Patent	(Cookson 1985)	Cookson, AH 1985, *Particle trap for compressed gas insulated transmission systems*, US Patent 4554399.
Standard: Retrieved From a Database	(Standards Australia 2008)	Standards Australia 2008, *Personal floatation devices - General requirements.* AS 4758.1-2008. Available from: Standards Australia Online. [1 December 2008].
Standard: Published	(Standards Australia/New Zealand Standard 1994)	Standards Australia 1994, *Information processing - text and office systems - office document architecture (ODA) and interchange format: part 10: formal specifications,*AS/NZS 3951.10:1994, Standards Australia, NSW.

CMO

Material Type	Example of Citation within the Text	Reference List Example
CMO Article	(Jennings 1997)	Jennings, P 1997, 'The performance and competitive advantage of small firms: a management perspective', *International Small Business Journal*, vol. 15, no. 2, pp. 63-75. Available from: The University of Western Australia Library Course Materials Online. [1 September 2004].

Lecture Notes

Material Type	Example of Citation within the Text	Reference List Example
Lecture Notes	(Foster 2004)	Foster, T 2004, *Balance sheets*, lecture notes distributed in Financial Accounting 101 at The University of Western Australia, Crawley on 2 November 2005.

Theses

Material Type	Example of Citation within the Text	Reference List Example
Thesis: Unpublished	(Hos 2005)	Hos, JP 2005, *Mechanochemically synthesized nanomaterials for intermediate temperature solid oxide fuel cell membranes.* Ph.D thesis, University of Western Australia.
Thesis: Published	(May 2007)	May, B 2007, *A survey of radial velocities in the zodiacal dust cloud.* Bristol UK, Canopus Publishing.
Thesis: Retrieved From a Database	(Baril 2006)	Baril, M 2006, *A distributed conceptual model for stream salinity generation processes: a systematic data-based approach.* WU2006.0058. Available from: Australasian Digital Theses Program. [12 August 2008].

Personal Communication

Material Type	Example of Citation within the Text
Telephone Call, Interview, e-mail, etc.	*If the information you are referencing was obtained by a personal communication such as a telephone call, an interview or an email that fact is usually documented in the text and are not added to the reference list. If desired you can add the abbreviation* pers.comm. *to the reference.* When interviewed on 6 June 2008, Mr M Ward confirmed... Mr M Ward confirmed this by facsimile on 6 June 2008. It has been confirmed that he will be touring Australia in the middle of next year (Mr M Ward, 2008, pers. comm., 6 June).

Citing Information Someone Else has Cited

Material Type	Example of Citation within the Text	Reference List Example
Citing Information	(O'Reilly, cited in Byrne	In the reference list provide the details of

| that Someone Else has Cited | 2008) | the author who has done the citing. |

A reference list: what it should look like?

Note: Please note the hanging indent for each reference makes the alphabetical sequence more obvious.

Andreasen, NC 2001, *Brave new brain: conquering mental illness in the era of the genome*, Oxford University Press, Oxford.

Belenky, M, Clinchy, B, Goldberger, N & Tarule, J 1986, *Women's ways of knowing*, Basic, New York.

Copstead, L & Banasik, J 2005, *Pathophysiology*, 3rd edn, Saunders, Philadelphia.

Craven, I (ed.) 2001, *Australian cinema in the 1990s,* Frank Cass, London.

Davis, M, Charles, L, Curry, MJ, Shanti, P, Prasad, S, Hewings, A et al. 2003*, Challenging spatial norms*, Routledge, London

Este, J, Warren, C, Connor, L, Brown, M, Pollard, R, O'Connor, T 2008, *Life in the clickstream: the future of journalism*, Media Entertainment and Arts Alliance, viewed 27 May 2009, <http://www.alliance.org.au/documents/foj_report_final.pdf>

Ferres, K 2001, 'Idiot box: television, urban myths and ethical scenarios', in I Craven (ed.), *Australian cinema in the 1990s*, Frank Cass, London.

Institute of Chartered Accountants in Australia 2004, *AASB standards for 2005: equivalents to IFRSs as at August 2004*, Person Education, Sydney, Australia.

Knowles, MS 1986, 'Independent study', in *Using learning contracts,* Jossey-Bass, San Francisco, pp. 89-96.

Storey, KB 2004, *Functional metabolism regulation and adaptation*, John Wiley & Sons, Hoboken, NJ, viewed 4 April 2009, NetLibrary database.

Wentworth, WC 1984, 'Why we need a permanent base on the moon', *The Sydney Morning Herald* 24 January, p. 11, viewed 3 April 2009, Sydney Morning Herald Archives database.

Younger, P 2004, 'Using the Internet to conduct a literature search', *Nursing Standard,* vol. 19, no. 6, pp. 45-51.

Abbreviations

Standard abbreviations may be used in your citations. A list of appropriate abbreviations can be found below:

Ed./Eds.	editor/editors
ed.	edition
et al.	and others
no.	number
p./pp.	page/pages
para.	paragraph
pt.	part
rev.	revised
suppl.	supplement
Vol.	Volume (book)
vol.	volume (journal)

Other Sources of Information

Other sources of information

Note: This list of examples is in no way exhaustive. Only the most often-used types of references are listed here. Refer to the following publications for more information on citing references:

RMIT University, Library, *Harvard Referencing.* Available from: <http://mams.rmit.edu.au/2nkrhwuswrpq.rtf> [26 July 2012].

Anglia Ruskin University, University Library, *Harvard System of referencing Guide.* Available from <http://libweb.anglia.ac.uk/referencing/files/Harvard_referencing_2011.pdf> [26 July 2012]

The University of New South Wales, The Learning Centre, *Harvard Referencing*. Available from <http://www.lc.unsw.edu.au/olib.html> [30 July 2012]

University of Southern Queensland, Library, *Harvard AGPS Referencing Guide*. Available from <http://www.usq.edu.au/library/help/referencing/harvard.htm> [30 July 2012]

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