

Unit Guide

ECE4087

Medical technology innovation

Semester 2, 2017

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Unit handbook information

Synopsis

This unit provides an introduction to the process of design and innovation with particular reference to medical technology. The design, development and manufacture of medical technology are covered, taking into consideration safety and effectiveness issues, regulatory and legal issues, the patient equipment interface and the hospital or medical environment in which the equipment is to be used. This will be achieved through case studies and development of a business plan.

Mode of delivery

Clayton (Day)

Onshore, Face to face

Workload requirements

3 hours lectures, 3 hours laboratory and practice classes and 6 hours of private study per week

Same as in Handbook

Unit relationships

Prerequisites

None

Prohibitions

ECE4807, ECE5087, ECE5807

Co-requisites

None

Chief Examiner(s)

[Professor Manos Varvarigos](#)

Unit Coordinator(s)

Name: Assoc Professor Nemai Karmakar

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Campus Coordinator(s)

Name: Dr Gita Pendharkar

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Building: , Room:

Consultation hours: Friday

Lecturer(s)

Name: Dr Gita Pendharkar

Email: Gita.Pendharkar@monash.edu

Building: , Room:

Demonstrator(s)

Shamsul Arefin

The unit consists of lectures introducing students to medical technology design and issues relating to its development and commercialization. Guest lecturers and research staff from the medical technology industry will present Australian medical technology case studies. Students will be required to participate in workshops where group work will enable them to develop new design concepts and investigate issues relating to these designs. Workshops will also provide a forum for these design concepts to be presented and critiqued. In these workshops the main learning approach is “Problem-based learning” which requires students to be involved with a hypothetical design and innovation project and to be proactive learners.

Academic Overview

Engineers Australia Stage 1 competencies

The Engineers Australia Policy on Accreditation of Professional Engineering Programs requires that all programs ensure that their engineering graduates develop to a substantial degree the stage 1 competencies. Listed below are the activities in this unit that will help you to achieve these competencies.

Note: that not all stage 1 competencies are relevant to each unit.

Element of competency	Indicators of attainment	Learning outcomes
1 Knowledge and skill base		
1.1 Engages with the engineering discipline at a phenomenological level, applying sciences and engineering fundamentals to systematic investigation, interpretation, analysis and innovative solution of complex problems and broader aspects of engineering practice.	a) Engages with the engineering discipline at a phenomenological level, applying sciences and engineering fundamentals to systematic investigation, interpretation, analysis and innovative solution of complex problems and broader aspects of engineering practice.	1,2,3
1.2 Develops and fluently applies relevant investigation analysis, interpretation, assessment, characterisation, prediction, evaluation, modelling, decision making, measurement, evaluation, knowledge management and communication tools and techniques pertinent to the engineering discipline.	a) Develops and fluently applies relevant investigation analysis, interpretation, assessment, characterisation, prediction, evaluation, modelling, decision making, measurement, evaluation, knowledge management and communication tools and techniques pertinent to the engineering discipline.	1,2,3
1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline.	a) Proficiently applies advanced technical knowledge and skills in at least one specialist practice domain of the engineering discipline.	1,2,3
1.4 Discernment of knowledge development and research directions within the engineering discipline.	a) Identifies and critically appraises current developments, advanced technologies, emerging issues and interdisciplinary linkages in at least one specialist practice domain of the engineering discipline.	1,2,3
	b) Interprets and applies selected research literature to inform engineering application in at least one specialist domain of the engineering discipline.	1,2,3

1.5 Identifies and applies systematic principles of engineering design relevant to the engineering discipline.	a) Identifies and applies systematic principles of engineering design relevant to the engineering discipline.	1,2,3
	b) Identifies and understands the interactions between engineering systems and people in the social, cultural, environmental, commercial, legal and political contexts in which they operate, including both the positive role of engineering in sustainable development and the potentially adverse impacts of engineering activity in the engineering discipline.	1,2,3
	c) Appreciates the issues associated with international engineering practice and global operating contexts.	1,2,3
	d) Is aware of the founding principles of human factors relevant to the engineering discipline.	1,2,3
	e) Is aware of the fundamentals of business and enterprise management.	1,2,3
	f) Identifies the structure, roles and capabilities of the engineering workforce.	1,2,3
1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.	a) Appreciates the basis and relevance of standards and codes of practice, as well as legislative and statutory requirements applicable to the engineering discipline.	1,2,3
	b) Appreciates the principles of safety engineering, risk management and the health and safety responsibilities of the professional engineer, including legislative requirements applicable to the engineering discipline.	1,2,3
	c) Appreciates the social, environmental and economic principles of sustainable engineering practice.	1,2,3
	d) Understands the fundamental principles of engineering project management as a basis for planning, organising and managing resources.	1,2,3
	e) Appreciates the formal structures and methodologies of systems engineering as a holistic basis for managing complexity and sustainability in engineering practice.	1,2,3
2. Engineering application ability		

2.1 Application of established engineering methods to complex engineering problem solving.	a) Identifies, discerns and characterises salient issues, determines and analyses causes and effects, justifies and applies appropriate simplifying assumptions, predicts performance and behaviour, synthesises solution strategies and develops substantiated conclusions.	1,1
2.2 Fluent application of engineering techniques, tools and resources.	a) Proficiently identifies, selects and applies the materials, components, devices, systems, processes, resources, plant and equipment relevant to the engineering discipline.	1
	j) Understands the role of quality management systems, tools and processes within a culture of continuous improvement	1
2.4 Application of systematic approaches to the conduct and management of engineering projects.	a) Contributes to and/or manages complex engineering project activity, as a member and/or as the leader of an engineering team.	1,2,3
	b) Seeks out the requirements and associated resources and realistically assesses the scope, dimensions, scale of effort and indicative costs of a complex engineering project.	1,2,3
	c) Accommodates relevant contextual issues into all phases of engineering project work, including the fundamentals of business planning and financial management	1,2,3
	d) Proficiently applies basic systems engineering and/or project management tools and processes to the planning and execution of project work, targeting the delivery of a significant outcome to a professional standard.	1,2,3
	e) Is aware of the need to plan and quantify performance over the full life-cycle of a project, managing engineering performance within the overall implementation context.	1,2,3
	f) Demonstrates commitment to sustainable engineering practices and the achievement of sustainable outcomes in all facets of engineering project work.	1,2,3
3. Professional and personal attributes		

3.1 Ethical conduct and professional accountability.	a) Demonstrates commitment to uphold the Engineers Australia - Code of Ethics, and established norms of professional conduct pertinent to the engineering discipline	1,2,3
	b) Understands the need for due-diligence in certification, compliance and risk management processes.	1,2,3
	c) Understands the accountabilities of the professional engineer and the broader engineering team for the safety of other people and for protection of the environment.	1,2,3
	d) Is aware of the fundamental principles of intellectual property rights and protection.	1,2,3
3.2 Effective oral and written communication in professional and lay domains.	a) Is proficient in listening, speaking, reading and writing English	1,2,3
	b) Prepares high quality engineering documents such as progress and project reports, reports of investigations and feasibility studies, proposals, specifications, design records, drawings, technical descriptions and presentations pertinent to the engineering discipline.	1,2,3
3.3 Creative, innovative and pro-active demeanour.	a) Applies creative approaches to identify and develop alternative concepts, solutions and procedures, appropriately challenges engineering practices from technical and non-technical viewpoints; identifies new technological opportunities.	1,2,3
	b) Seeks out new developments in the engineering discipline and specialisations and applies fundamental knowledge and systematic processes to evaluate and report potential.	1,2,3
	c) Is aware of broader fields of science, engineering, technology and commerce from which new ideas and interfaces may be drawn and readily engages with professionals from these fields to exchange ideas.	1,2,3
3.4 Professional use and management of information.	a) Is proficient in locating and utilising information - including accessing, systematically searching, analysing, evaluating and referencing relevant published works and data; is proficient in the use of indexes, bibliographic databases and other search facilities.	1,2,3

	b) Critically assesses the accuracy, reliability and authenticity of information.	1,2,3
	c) Is aware of common document identification, tracking and control procedures.	1,2,3
3.5 Orderly management of self, and professional conduct.	a) Demonstrates commitment to critical self-review and performance evaluation against appropriate criteria as a primary means of tracking personal development needs and achievements.	1,2,3
	b) Understands the importance of being a member of a professional and intellectual community, learning from its knowledge and standards, and contributing to their maintenance and advancement.	1,2,3
	c) Demonstrates commitment to life-long learning and professional development.	1,2,3
	d) Manages time and processes effectively, prioritises competing demands to achieve personal, career and organisational goals and objectives.	1,2,3
	e) Thinks critically and applies an appropriate balance of logic and intellectual criteria to analysis, judgement and decision making.	1,1,2,3
	f) Presents a professional image in all circumstances, including relations with clients, stakeholders, as well as with professional and technical colleagues across wide ranging disciplines.	1,2,3
3.6 Effective team membership and team leadership.	a) Understands the fundamentals of team dynamics and leadership.	1,2,3
	b) Functions as an effective member or leader of diverse engineering teams, including those with multi-level, multi-disciplinary and multi-cultural dimensions.	1,2,3
	c) Earns the trust and confidence of colleagues through competent and timely completion of tasks.	1,2,3
	d) Recognises the value of alternative and diverse viewpoints, scholarly advice and the importance of professional networking.	1,2,3
	e) Confidently pursues and discerns expert assistance and professional advice.	1,2,3

	f) Takes initiative and fulfils the leadership role whilst respecting the agreed roles of others.	1,2,3
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Teaching and learning method

Active learning Face to Face

Lecture and/or tutorials

Case-based teaching- Guest Lectures

Workshops involving research activities

Field trips

Learning outcomes

At the successful completion of this unit you will be able to:

1. Describe the process of medical technology innovation in the context of Australian case studies.
2. Propose a conceptual design for a new device using medical technology considering a wide range of parameters including technical feasibility, patient/doctor acceptance, manufacturability, financial viability, and safety.
3. Formulate a business plan for new technology innovation.

Your feedback to us

One of the formal ways students have to provide feedback on teaching and their learning experience is through the Student Evaluation of Teaching and Units (SETU) survey. The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied with and areas for improvement.

Previous student evaluations of this unit

In response to previous SETU results of this unit, the following changes have been made:

Based on the feedback received, the unit will be made more interesting by introducing industry visits and guest lectures.

The study course will also be updated and there will be more student interaction included in the normal course of delivery.

Student feedback has highlighted the following strength(s) in this unit:

71% found the unit to be intellectually stimulating

85.7% of the students agreed that the unit enabled them to achieve its learning objectives

71% of the students said that the learning resources in this unit supported their studies

78% of the students said that the feedback they received in this unit was useful

78% of the students were satisfied with the quality of this unit

If you wish to view how previous students rated this unit, please go to:

<https://unitevaluations.connect.monash.edu.au/unitevaluations/index.jsp>

Unit schedule

Week	Lectures Friday -2Hrs	Guest Lectures (Thursday) (Case study)	Workshop (Either Tuesday, Thursday or Friday)	Assignments
1	1. Introduction to the unit, topics, delivery schedule, assessments and Innovations, Inventions & IP		1. Innovation Workshop - Briefing	Assignment 1 Issued.
2	2. Medical technology development and commercialization	1. Case study 2 – 3rd August- Gita Pendharkar	2. Innovation Workshop - Technology for an disabled children	
3	3. Invention of medical equipment and devices, the inventor.	2. Case Study 3 10th August- Mark Summerfield	3. Innovation Workshop - Inventing	Assignment 1 due & Assignment 2 Issued.
4	4. The design process, regulation and design.	3. Case Study 3 – 17th August - Dilpreet	4. Innovation Workshop - Processing Ideas	
5	5. Clinical evaluation, regulation and evaluation.	4. Case Study 4 – 24th August	5. Innovation Workshop - Presenting Ideas	
6	6. Government incentives, venture capital, and commercialization	5. Case Study 5- 31 st August	6. Innovation Workshop - Presenting Ideas	
7	7. Research & Development	6. Case Study 6 – 7th Sep- Peter Seligman	7. Innovation Workshop - Business Case Development	Assignment 2 due & Assignment 3 Issued.
8	8. Intellectual property management.	7. Case Study 7 – 14th Sep Dr. Yaniv Blamey & Saunders	8. Innovation Workshop - R&D Management	
9	9. Business and Financial planning and making a profit.	Industry Visit for students 25th Sep- Dr. Vaishali Joshi (Valley Private)	9. Innovation Workshop – Production and Market entry	
Mid Semester Break (25 th Sep -29 th Sep)				

10	10. Market Research and Marketing.	Innovation Workshop - Business Case Presentation	10. Innovation Workshop – Business Case Presentation	
11	11. Revision for exam	Innovation Workshop - Business Case Presentation	11. Innovation Workshop - Business Case Presentation	
12	12. Man machine interface - design for usability	Innovation Workshop - Business Case Presentation	12. Innovation Workshop - Business Case Presentation	Assignment 3 due

Assessment requirements

Assessment summary

Continuous assessment: 50%

Examination: (2 hours) 50%

Students are required to achieve at least 45% in the total continuous assessment component (assignments, tests, mid-semester exams, laboratory reports) and at least 45% in the final examination component and an overall mark of 50% to achieve a pass grade in the unit. Students failing to achieve this requirement will be given a maximum of 45% in the unit.

Assessment task	Value	Due date
Assessment Task 1: Individual Medical technology innovation context – investigation of childhood disability.	10%	13/08 /17
Assessment Task 2:- Conceptual model of medical technology innovation process.	10%	10/09 /17
Assessment Task 3: Business case study for the development of a new assistive technology for the disabled children.	30%	Week 12
Written Examination	50%	To be advised

Hurdle requirements

This unit is a hurdle.

Students must achieve a mark of 45% in each of these components (assignments and written exam) and an overall mark of 50% to achieve an overall pass grade. The unit coordinator reserves

the right to moderate the assessments given by the individual tutors. This process will occur at the end of the semester.

Assessment tasks

Assessment title: Assessment Task 1: Individual Medical technology innovation context – investigation of childhood disability.

Mode of delivery: Through weekly workshops

Details of task: Details of task: Length: 3000 word report & group presentation.

In the context of designing a new item of assistive technology for disabled children, students are required to research disease and disability related to children. Students will use available library reference material to produce a report that classifies childhood disability and its prevalence. This research will provide a context for subsequent workshop and assignment work dealing with the design of assistive technology.

Release dates (where applicable): 24/07/17

Word limit (where applicable): 3000 words

Due date: 13/08/17

Value: 10%

Presentation requirements: Nil

Hurdle requirements (where applicable): Yes

Individual assessment in group tasks (where applicable): Each student will submit their own research findings as per the assessment and upload through Moodle.

Criteria for marking: Criteria for Assessment task 1:

The research report will be assessed in relation to its technical content, cited

Material, referencing, and report presentation.

Further details will be provided at the time of assignment is provided.

Additional remarks: None

Assessment title: Assessment Task 2:- Conceptual model of medical technology innovation process.

Mode of delivery: Workshops

Details of task: Details of task: Length: 3000 word report.

Develop a conceptual model representing the process of medical technology innovation. The model should represent the process involved in developing a new medical technology from the conception stage to full medical usage, the various stages involved in this process, and the external factors that may influence the staged process. Each aspect of the process should be briefly discussed in terms of a particular medical device.

Release dates (where applicable): 30/07/17

Word limit (where applicable): 3000

Due date: 10/09/17

Value: 10%

Presentation requirements: Yes

Hurdle requirements (where applicable): Yes

Individual assessment in group tasks (where applicable):

Details of task: Length: 3000 word report.

Develop a conceptual model representing the process of medical technology innovation. The model should represent the process involved in developing a new medical technology from the conception stage to full medical usage, the various stages involved in this process, and the external factors that may influence the staged process. Each aspect of the process should be briefly discussed in terms of a particular medical device

Criteria for marking: Criteria for Assessment task 2:

The report will be assessed in relation to the originality of the conceptual model, cited

material, referencing, and report presentation.

Further details will be provided at the time of assignment is provided.

Additional remarks: Individual Report needs to be submitted by every student via Moodle. feedback will be provided after two/three weeks.

Assessment title: Assessment Task 3: Business case study for the development of a new assistive technology for the disabled children.

Mode of delivery: Workshops

Details of task: Details of task: Length: 30- 40 page report and individual presentation.

1. In this assignment students are required to use the outcomes of their participation in innovation workshops and previous assignments to develop a business plan for a new assistive technology for disabled children.

2. Initially students will work in groups to:-

Σ Generate ideas for a number of possible innovative assistive technologies

Σ Establish a basis for comparing these products (prevalence of disease, or size of market) and rank them in relation to commercial or medical potential...

Σ Group workshop presentation.

3. Research

Σ Look at US patient register for possible competitive products

Σ Look at scientific literature for competitive products

Σ Look at FDA web page for other product approvals

Σ Investigate how to patent

4. Develop a conceptual design to the stage where you can present to class. Assume that you are presenting to your Company boss for approval to proceed. Week 8.

5. Develop a research plan to develop a working prototype within one year, and cost a budget.

6. Develop a business plan that includes:-

Σ Executive Summary

Σ Essential features of design

Σ Background to idea

Σ Market analysis

Σ Market Plan

Σ Production Plan

Σ Organization Plan

Σ Research and Development Plan

Σ Financial Plan

Σ Summary

Release dates (where applicable): 30/07/17

Word limit (where applicable): 30-40 pages

Due date: Week 12

Value: 30%

Presentation requirements: Yes - Group Presentation

Hurdle requirements (where applicable): Yes, as specified in assessment summary

Individual assessment in group tasks (where applicable): In this assignment students are required to use the outcomes of their participation in innovation workshops and previous assignments to develop a business plan for a new assistive technology for disabled children. The group can submit one Business Plan through Moodle.

Criteria for marking: Criteria for Assessment task 3:

This task will be assessed in relation to the quality of the report and content of its various sections and the clarity and strength of the case made in the individual classroom presentation to be made in weeks 11 and 12.

Further details will be provided at the time of assignment is provided.

Criteria for Marking:

The research report will be assessed in relation to its technical content, cited material, referencing, and report presentation. Further details will be provided at the time of assignment is provided.

The following examples of the grading scale should help to explain the criteria that will be used for marking the essays.

Additional remarks: None

Exam title: Written Examination

Weighting: 50%

Length: 2 Hrs

Type (Open/closed book): Closed Book

Hurdle requirements (where applicable): Yes

Electronic devices allowed: Calculators

Remarks (where applicable): Criteria for Marking:

The research report will be assessed in relation to its technical content, cited material, referencing, and report presentation. Further details will be provided at the time of assignment is provided.

The following examples of the grading scale should help to explain the criteria that will be used for marking the essays. **Please note that indicative grades only will be used for the marking of this essay.**

High Distinction

The essay shows clear evidence of critical analysis, and reflection on the texts that were reviewed. There is a broad range of original and personal insights into the work of this author or illustrator or of the genre of Indigenous literature for children. Quality professional reading is evident and this is used to enrich the discussion and critique of the reviewed work. Familiarity with a wide range of the reviewed texts is evident. All assignment-writing requirements are met to the highest standard (eg presentation, coherency, spelling, referencing, and grammar).

Distinction

The essay shows clear evidence of critical analysis and reflection on the texts that were reviewed. There is some original thinking evident in the discussion. Professional reading on this topic or person is used to enrich the discussion. Familiarity with a range of the reviewed texts is evident. All assignment-writing requirements are of a very good standard (presentation, coherency, spelling, referencing, and grammar).

Credit

The essay is focused on description although there is some attempt to critically analyse the texts which were reviewed. Professional reading on the topic or the person is evident but limited in scope and quality. While the discussion shows that there is a good understanding of the chosen topic, there is a lack of originality of thinking. Guidelines for assignment writing have been met at a satisfactory standard.

Pass

Overall, the essay is focused on description with scant evidence of critical analysis or reflection. The discussion reveals a limited understanding of the elements involved in the creation of children's literature or illustrations (Topic 1) or of quality indigenous literature for children (Topic 2). There is little evidence of professional reading on the chosen topic. Guidelines for assignment writing have been met at the satisfactory level.

Returning assignments

Assignments should be uploaded via links provided through Moodle

Resubmission of assignments

Due dates and extensions

The due dates for the submission of assignments are given in the previous section. Please make every effort to submit work by the due dates. Students are advised to NOT assume that granting of an extension is a matter of course.

If you need an extension for any of the assignments, you must submit a written request 48-hours *before* the due time and date, and attach supportive evidence such as medical certificate.

The form should preferably be forwarded as an email attachment, sent to the unit coordinator. The email should be sent from your University email address with your name typed in lieu of signature.

Note that other lecturers cannot grant extensions. Lecturer-in-charge (unit coordinator) will indicate at the time of granting the extension whether any penalty in marks will apply to the submitted work.

If an extension is granted, the approval must be attached to the assignment.

Plagiarism and collusion

Intentional plagiarism or collusion amounts to cheating under Part 7 of the Monash University (Council) Regulations.

Plagiarism: Plagiarism means taking and using another person's ideas or manner of expressing them and passing them off as one's own. For example, by failing to give appropriate acknowledgement. The material used can be from any source (staff, students or the internet, published and unpublished works).

Collusion: Collusion means unauthorised collaboration with another person on assessable written, oral or practical work and includes paying another person to complete all or part of the work. Where there are reasonable grounds for believing that intentional plagiarism or collusion has occurred, this will be reported to the Associate Dean (Education) or delegate,

Referencing requirements

Please use Harvard Style for referencing in your assignments.

To build your skills in citing and referencing, and using different referencing styles, see the online tutorial Academic Integrity: Demystifying Citing and Referencing at <http://www.lib.monash.edu.au/tutorials/citing/>

Assignment submission

Hard Copy Submission:

Hard copy submissions will not be permitted.

Online Submission: If Electronic Submission has been approved for your unit, please submit your work via the Moodle site or other; as directed by your demonstrator for this unit.

Please keep a copy of tasks completed for your records.

Feedback to you

Feed back on the assignments will be provided to the student after two to three weeks of submission. If any student wants to discuss the assignment marks, please email your tutor.

Learning resources

Recommended textbooks

1. Adopting new medical technology. Editor: A C Gelijns and H V Dawkins..

Publisher: National Academic Press Washington D C 1994.

2. Biomedical Materials and design ISBN 97808 24707910 . Title: BIOMIMETIC

MATERIALS AND DESIGN: BIOINTERFACIAL STRATEGIES, TISSUE

ENGINEERING, AND TARGETED DRUG DELIVERY ISBN: 0824707915. Editor:

ANGELA K. DILLOW. Publisher: MARCEL DEKKER Pub Year: 2002

3. Biomedical technology and devices handbook ISBN 97808 49311406 . Editor:

JAMES MOORE. Publisher: CRC PRESS Place of Publication: BOCA RATON Pub

Year: 2004

4. Design controls for medical device industry ISBN 97808 24708306 .Author:

TEIXERIA, MARIE B. Publisher: MARCEL DEKKER Pub Year: 2002

5. Design of biomedical device systems ISBN 97808 24708894 . Author: King, Paul

H., 1941-. Publisher: New York : Marcel Dekker, 2003.

6. Designing usability into Medical products ISBN 97808 49328435 . Author:

Wiklund, Michael E.. Publisher: Boca Raton : CRC Press, 2005.

7. Evaluating, selecting and using appropriate assistive technology.. Author J C

Gavin and M J Scherer.. Publisher An Aspin Publication. Maryland, 1996.

8. Management of medical technology . Author Eliezer Geisler and Ori Heller. .

Publisher: Kluwer Academic Publishers.Boston/London/Dresden.1998.

9. Managing innovation and entrepreneurship in technology based firms.. Author: M J

C Martin. Publisher John Wiley and sons. Newyory 1994.

10. Medical physics and bioengineering ISBN 97807 50303682 . Title: Medical

physics and biomedical engineering . Author: B.H. Brown ... [et al.]..

11. Publisher: Philadelphia ; Bristol : Institute of Physics Pub., 1999.

12. SAFETY evaluation of medical devices ISBN 97808 24706173 Title: SAFETY

EVALUATION OF MEDICAL DEVICES.. Author: GAD, SHAYNE COX. Publisher:

MARCEL DEKKER Place of Publication: NEW YORK. Pub Year: 2002 ISBN:

082470617X

13. Six Sigma for medical device design ISBN 97808 49321054 . Title: SIX SIGMA

FOR MEDICAL DEVICE DESIGN.. Author: JUSTINIANO, JOSE. Publisher: CRC

PRESS Place of Publication: BOCA RATON Pub Year: 2005

14. The Medical Arms Race. Author: Susan Bartlett Foote. Publisher University of

California Press. Berkeley, Los Angeles, London.1992.

Monash Library Unit Reading List (if applicable to the unit):

<http://readinglists.lib.monash.edu/index.html>

Required resources

Students generally must be able to complete the requirements of their course without the imposition of fees that are additional to the student contribution amount or tuition fees. However, students may be charged certain incidental fees or be expected to make certain purchases to support their study. For more information about this, go to Administrative Information for Higher Education Providers: Student Support, Chapter 21, Incidental Fees at: <http://www.innovation.gov.au/HigherEducation/TertiaryEducation/ResourcesAndPublications/Pages/default.aspx>

Martin J C M , Managing innovation and entrepreneurship in technology based firms,
Wiley, 1994.

Susan Bartlett-Foote, Managing The Medical Arms Race, Berkeley: University of
California Press, c1992.

Johnson, S.F. Gostelow, J.P., Jones, E. and Fourikis, R., Engineering and Society,
Harper Educational, 1995.

Bradbury, Product Innovation – Idea to exploitation, John Wiley 1989.

Brown, Carter, Davie and Gilvie, Research Development and Innovation, Engineers
Australia Pty. Ltd. 1997. ISBN 0858256657.

Technological requirements

All the announcements, email correspondence regarding this unit will be communicated through Moodle.

Please check Moodle for announcements regularly.

Additional unit costs

There is no additional cost involved except for field trip (if there is one planned). The students will have to arrange for their own transportation during the field trip.

Field trips

The unit co-ordinator will organise a field trip based on the interest among the students.

If a field trip is planned, the students will be informed through Moodle.

Other information

Policies

Monash has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and to provide advice on how they might uphold them. You can find Monash's Education Policies at:

<http://www.policy.monash.edu/policy-bank/academic/education/index.html>

Graduate Attributes Policy

<http://www.monash.edu/policy-bank/academic/education/course-governance-and-design/course-design-policy>

Student Charter

<http://www.monash.edu/students/policies/student-charter.html>

Student Services

The University provides many different kinds of services to help you gain the most from your studies. Contact your tutor if you need advice and see the range of services available at:

<http://www.monash.edu/students>

Monash University Library

The Monash University Library provides a range of services, resources and programs that enable you to save time and be more effective in your learning and research.

Go to <http://www.monash.edu/library> or the library tab in <http://my.monash.edu.au> portal for more information.

Disability Support Services

Students who have a disability, ongoing medical or mental health condition are welcome to contact Disability Support Services.

Disability Support Services also support students who are carers of a person who is aged and frail or has a disability, medical condition or mental health condition.

Disability Advisers visit all Victorian campuses on a regular basis.

- Website: monash.edu/disability
- Telephone: 03 9905 5704 to book an appointment with an Adviser;
- Email: disabilitysupportservices@monash.edu
- Drop In: Level 1, Western Annexe, 21 Chancellors Walk (Campus Centre) Clayton Campus

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