



EDSE14005 *Manufacturing*

Term 2 - 2017

Profile information current as at 03/05/2024 03:53 pm

All details in this unit profile for EDSE14005 have been officially approved by CQU University and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

As a capstone unit to the suite of Industrial Technology and Design (INTAD) units, this unit engages pre-service teachers with their larger role in the agenda of the delivery of integrated Science, Technology, Engineering and Maths (STEM) education. This unit challenges pre-service teachers to engage secondary school students in an interdisciplinary and applied approach which will excite and engage them with real world application and problem solving. The unit brings together the required hand skills and understanding from the preceding INTAD units to develop a program that will inspire young people with a manufacturing interest towards careers that will build our nation. With the support of the Re-Engineering Australia Foundation, this unit seeks to redress the disjointed approach to STEM with a cohesive learning paradigm which combines these strands on a platform of innovation and creativity.

Details

Career Level: *Undergraduate*

Unit Level: *Level 4*

Credit Points: 6

Student Contribution Band: 7

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

30 credit points (5 units) from the Industrial Technology and Design minor.

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

Offerings For Term 2 - 2017

- Distance

Attendance Requirements

All on-campus students are expected to attend scheduled classes - in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Residential Schools

This unit has a Compulsory Residential School for distance mode students and the details are:

Click here to see your [Residential School Timetable](#).

Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

[Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

[Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Practical Assessment**

Weighting: 50%

2. **Portfolio**

Weighting: 50%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the [CQUniversity Policy site](#).

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Students Course Evaluations and feedback from residential School.

Feedback

Practical workshop at the Residential School are excellent and provide students with great learning experiences.

Recommendation

Continue intensive residential Schools workshops.

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Plan and develop a STEM program based on a suite of design and construction activities.
2. Apply skills sequences and procedures using CAD/CAM, virtual modelling techniques and appropriate discipline specific teaching techniques.
3. Apply problem solving, planning, sequencing, implementing and assessing strategies to STEM applications and processes to promote STEM education including the application of innovation.
4. Critically evaluate the design and manufacture of STEM teaching and production processes.
5. Apply appropriate workplace health and safety and maintenance practices when engaging in design and manufacturing activities.

This unit aligns with the following Australian Professional Standards for Teachers (Graduate Career Stage):

Standard 2: Know the content and how to teach it

2.1 Content and teaching strategies of the teaching area

2.2 Content selection and organisation

Standard 4: Create and maintain supportive and safe learning environments

4.4 Maintain student safety

Standard 7: Engage professionally with colleagues, parents/carers and the community

7.2 Comply with legislative, administrative and organisational requirements

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Practical Assessment - 50%	•	•	•	•	•
2 - Portfolio - 50%	•	•	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Textbooks and Resources

Textbooks

There are no required textbooks.

Additional Textbook Information

Students will need to access to the following:

- **Autodesk Inventor Professional 2016**
- **Autodesk Flow Design 2016**
- <http://www.autodesk.com/education/free-software/all>
- **F1 in Schools Rules and regulations (2015 Technical Regulations)**
- <http://rea.org.au/wp-content/uploads/Australian-Technical-Regulations-v1.pdf>
- **Car Aerodynamics Basics and How-To Design Tips**
- <http://www.buildyourownracecar.com/race-car-aerodynamics-basics-and-design/>
- **Autodesk Flow PDF Instructions**
-

http://static-dc.autodesk.net/content/dam/autodesk/www/industries/education/docs/Introduction_to_Autodesk_Flow_Design_F1_in_Schools_Screen_Version_%20R1.pdf

- **Senior Graphics Syllabus 2013**
- <https://www.qcaa.qld.edu.au/senior/subjects/ict-design/graphics-2013>
- Australian Curriculum description of the **Processes and Production Skills follow similar**
- <http://www.australiancurriculum.edu.au/technologies/design-and-technologies/curriculum/f-10?layout=1#level9-10>

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

Referencing Style

All submissions for this unit must use the referencing style: [American Psychological Association 6th Edition \(APA 6th edition\)](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Brad Connolly Unit Coordinator

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Schedule

Week 1 - 10 Jul 2017

Module/Topic

Chapter

Events and Submissions/Topic

Readings/Clips (Introduction to STEM)

Bringing Science to Life: What is STEM?

<https://www.youtube.com/watch?v=faMRXPhKntM&feature=youtu.be>

STEM Integration in K-12 Education

<https://www.youtube.com/watch?v=AlPj48smtF>

Project Based Learning: Explained

<https://www.youtube.com/watch?v=LMCZvGesRz8>

STEM hub for schools

<https://learningplace.eq.edu.au/cx/resources/file/0fc6062c-a582-4c7b-9313-dc453c8d8901/1/index.html>

QLD Government Education

or <http://www.education.qld.gov.au/STEM/> and follow the link the STEM hub.

National School STEM Strategy

<http://www.educationcouncil.edu.au/site/DefaultSite/filesystem/documents/National%20STEM%20School%20Education%20Strategy.pdf>**Readings/Clips (STEM application in Schools - Robotics)**

First Robotics Competition

<http://firstaustralia.org/programs/first-robotics-competition/>

What's FIRST Robotics Competition (FRC) - full version

<https://www.youtube.com/watch?v=hcS7M4sY0fQ>

Association of Independent Schools NSW (Clear definition of STEM and links to examples and resources)

https://www.aisnsw.edu.au/Services/Partnerships_in_Education/STEM/Pages/About.aspx**Step 1.** Read quiz guideline document. **Step 2.** View the 3 introduction to STEM media clips, read the STEM hub for schoolshomepage, read NATIONAL STEM SCHOOL EDUCATION STRATEGY document. **Step 3.** Answer Introduction to STEM quiz questions.**Step 4.** View the media clip and read First Robotics Competition website. **Step 5.** Answer STEM application in schools quiz questions.Assessment Item 1A
Introduction to STEM
Applications of STEM in SchoolsSet - Assessment Item 1A
(Introduction to STEM quiz 10X)
Set - Assessment Item 1A (STEM
application in schools quiz 10X)**Week 2 - 17 Jul 2017**

Module/Topic	Chapter	Events and Submissions/Topic
Assessment Item 1A Introduction to F1 in Schools Applications of STEM in Schools	F1 in Schools Singapore Closing Film https://www.youtube.com/watch?v=qh_ZPVtSngY F1 in Schools http://rea.org.au/f1-in-schools/ F1 in Schools 2016-2017 Australian Rules and Regulations (Car Design Specifications) http://rea.org.au/wp-content/uploads/2016-2017-Australian-Technical-Regulations-v1-19-April.pdf Step 1. View the F1 in Schools Singapore Closing Film. Step 2. Read quiz guidelines document. Step 3. Investigate the F1 in Schools website. Step 4. Complete F1 in Schools quiz. Step 5. Read the 2016-2017 Australian Technical Regulations. Step 6. Complete technical Regulations Quiz.	Set - Assessment Item 2A (F1 in Schools quiz 10X) Set - Assessment Item 2A (Technical Regulations quiz 10X)

Week 3 - 24 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Assessment Items 1B & 1C CAD Car Model Design Folio Exemplar	Readings Teach Engineering Website Curriculum for K-12 Teachers (Click Next and read each step outline) https://www.teachengineering.org/engrdesignprocess.php QLD Senior Graphics Syllabus Pages 4-6 Course Organisation (Suggest suitable design tasks) https://www.qcaa.qld.edu.au/downloads/senior/snr_graphics_2013_syll.pdf Technology Students Design Process Resources (Useful graphic organisers and resources) http://www.technologystudent.com/designpro/despro1.htm Downloads Autodesk Inventor 2016 Autodesk Flow 2016 Autodesk Community Get Free Software (You will need your student email) http://www.autodesk.com/education/free-software/all CAD Tutorial Clips Autodesk Inventor Professional Tutorial Clips 1, 2, 3 & 4. Step 1. Read portfolio assessment items 1B and 1C outlines. Step 2. Download design folio template and example. Step 3. Familiarise yourself with the various stages of the design process by viewing the teach engineering website link, and QLD Senior Graphics Syllabus pages 4-6. Technology student website also has a detailed description with resources of how to engage within the design process. Step 4. Create an account with Autodesk, and then download Autodesk Inventor Professional and Autodesk Flow Design 2016 or 2017. Step 6. Create a folder titled WARMUPS for you CAD files. Step 7. View and practice Autodesk Inventor Tutorial Clips 1 to 4. Step 8. Save all introduction tutorial CAD files into the WARMUPS folder.	Due - Assessment Item 1A (Introduction to STEM quiz 10X) Due - Assessment Item 1A (STEM application in schools quiz 10X) Due - Assessment Item 1A (F1 in Schools quiz 10X) Due - Assessment Item 1A (Technical Regulations quiz 10X) Set - Assessment Item 1B (CAD Car Model) Set - Assessment Item 1C (Design Folio Exemplar)

Week 4 - 31 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Assessment Items 1B & 1C CAD Car Model Design Folio Exemplar	Car Aerodynamics Basics How-to Design Tips http://www.buildyourownracecar.com/race-car-aerodynamics-basics-and-design/ F1 in Schools 2016-2017 Australian Rules and Regulations (Car Design Specifications) http://rea.org.au/wp-content/uploads/2016-2017-Australian-Technical-Regulations-v1-19-April.pdf Step 1. Visit the Build Your Own Race Car website and Read Car Aerodynamics Basics and How-To Design Tips. Step 2. Revise the Technical Rules and Regulations for the F1 in Schools competition Step 3. Complete Design Criteria page of the design folio.	Complete Stage 1 of the Design Folio (Car Criteria)

Week 5 - 07 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
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**CAD Tutorial Clips
Autodesk Inventor Professional
Tutorial Clips 5 - 26**

Please note:

New projects with various parts should be saved in an assigned folder.

CAD Tutorials 1 - 4 part files are to be saved in a folder title **WARMUPS**.

CAD Tutorials 5 - 26 part, assembly, drawing, render and flow design files are to be saved in a folder titled **CO2CAR1**.

ALL CAD files created for **your final race car** design are to be saved in a folder titled **CO2CAR2**.

Important:

The Car Body Manufacture CAD

File is due: 19/09/16 (Week 9) for scrutineering. This is to ensure you are able to participate successfully in the residential school component of the unit. Feedback will be provided if changes are required to make the design suitable for machining.

Please save the CAD file in the following format: **Last name _ First name_ CAR2manufacture**

Remember:

Back up your CAD files by saving them in multiple places.

Do not design the overall length of your CO2 car beyond 200mm.

Step 1. View CAD tutorials 1 - 4. **Step**

2. Create models from CAD tutorials 1

- 4. **Step 3.** Save models created in

tutorials 1 - 4 in a folder titled

WARMUPS. **Step 4.** Start to view CAD

tutorials 5 -26. **Step 5.** Begin to create

the CAD Car Model. **Step 6.** Save all

files for the CAD Car in a folder titled

CO2CAR1.

Assessment Items 1B & 1C
CAD Car Model
Design Folio Exemplar

Complete CO2CAR1 (tutorial car)

Vacation Week - 14 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 21 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Assessment Items 1B & 1C CAD Car Model Design Folio Exemplar	Draw a Box provides step by step instructions on how to draw (Click on learn and view lessons 6 & 7) http://drawabox.com/ Car Aerodynamics Basics How-to Design Tips http://www.buildyourownracecar.com/race-car-aerodynamics-basics-and-design/ F1 in Schools 2016-2017 Australian Rules and Regulations (Car Design Specifications) http://rea.org.au/wp-content/uploads/2016-2017-Australian-Technical-Regulations-v1-19-April.pdf Step 1. View Draw a Box step by step instructions on how to draw (Click on learn and view lessons 6 & 7). Step 2. Refer to the 2016-2017 Australian Technical Regulations and Build Your Own Race Car website and Read Car Aerodynamics Basics and How-To Design Tips. Step 3. Complete stage 2 of the design folio (Car Design Ideas). Step 4. Complete CAD tutorials 5 - 20.	Complete stage 2 of the Design Folio (Car Design Ideas)

Week 7 - 28 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
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CAD Tutorial Clips

Autodesk Inventor Professional Tutorial Clips 1 - 26

Step 1. View CAD tutorial 24. **Step 2.** Refer to your design ideas in stage 2 of the design folio. **Step 3.** Modify a copy of the CAD car model to incorporate some of your design ideas. **Step 4.** Save the modified CAD car model as C02CAR2. **Step 5.** Complete stage 3 of the design folio (Design Development CAD). **Step 6.** View CAD tutorials 25 - 26 and updates. **Step 7.** Complete the design folio cover (Car Render).

Assessment Items 1B & 1C
CAD Car Model
Design Folio Exemplar

Complete Modified CAD Car Model (C02CAR2) Due Week 9
Complete the Design Folio Cover (Car Render)

Week 8 - 04 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Assessment Items 1B & 1C CAD Car Model Design Folio Exemplar	F1 in Schools 2016-2017 Australian Rules and Regulations (Car Design Specifications) http://rea.org.au/wp-content/uploads/2016-2017-Australian-Technical-Regulations-v1-19-April.pdf Tutorial Clips Autodesk Inventor Professional Tutorial Clips 21 - 23 Step 1. Revise how to create an Inventor Drawing file by viewing tutorial clips 21 -23. Step 2. Create C02CAR2 Compliance Drawing idw. Step 3 Refer to the 2016-2017 Australian Technical Regulations. Step 4. Annotate Inventor Drawing with dimensions, rules and regulations. Step 5. Complete folio stage 4 of the design folio (Compliance Drawing).	Complete (C02CAR2 Compliance Drawing) Due Week 9 Complete Stage 4 of the Design Folio (Compliance Drawing)

Week 9 - 11 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Assessment Items 1B & 1C CAD Car Model Design Folio Exemplar	Autodesk Inventor Flow Design Instructions for F1 http://static-dc.autodesk.net/content/dam/autodesk/www/industries/education/docs/Introduction_to_Autodesk_Flow_Design_F1_in_Schools_Screen_Version_%20R1.pdf Fluid dynamics simulations http://wiki.bk.tudelft.nl/wiki/pedia/Flow_Design_-_windsimulation Introduction to Autodesk Flow design F1 (PDF) Tutorial Clips Autodesk Flow Design Clips 27 - 28 Step 1. Download and read Introduction to Autodesk Flow Design (PDF). Step 2. View and follow Flow Design tutorial clips 27 & 28. Step 3. Complete stage 5 of the design folio (Car Design Analysis/Computational Fluid Dynamics).	Due - Assessment Item 1B (C02CAR2 Model) Part file (ipt) Last name_First name_C02CAR2 Model Due - Assessment Item 1B (C02CAR2 Compliance Drawing) Drawing file (idw) Last name_First name_C02CAR2 Compliance Drawing Complete Stage 5 of the Design Folio (Car Design Analysis/Computational Fluid Dynamics)

Week 10 - 18 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Assessment Item 1C Design Folio Exemplar Assessment Item 2B Design Folio & 3D Modelling CAD	Feedback and adjustments Submit Design Folio in the following format: Last name_First name_DesignFolio Step 1. Complete design folio exemplar and submit online. Step 2. Adjust car designs according to feedback. Step 3. Resubmit new CAD Car Model if requested via email.	Due - Assessment Item 2B Design Folio Last name_First name_DesignFolio

Week 11 - 25 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Assessment Item 2A & 2B C02 Race Car Manufacturing Logbook	Residential School - Computer Aided Design and Manufacture Monday 25th September - Wednesday 27th of September 2017 Thursday 28th September - Saturday 30th of September 2017 Mackay Engineering College	Due - Assessment Item 1A (C02 Race Car) Due - Assignment Item 1A (A4 Photo Page of finished C02 Race Car) Last name_First name_C02 Race Car Set - Assessment Item 1B (Manufacturing Logbook) Due week 12

Week 12 - 02 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
Assessment Item 2B Manufacturing Logbook	Manufacturing Logbook Step 1. Complete Manufacturing Logbook Presentation. Step 2. Save presentation submit online.	Due - Assessment Item 1B (Manufacturing Log) Last name_First name_Manufacturing Logbook Practical Assessment- Compulsory Residential School Due: Week 12 Friday (6 Oct 2017) 5:00 pm AEST

Review/Exam Week - 09 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
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Exam Week - 16 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
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Assessment Tasks

1 Practical Assessment- Compulsory Residential School

Assessment Type

Practical Assessment

Task Description

Assessment Title: **Computer Aided Design and Manufacture**

Task Description

This assessment task consists of two parts:

Part A - C02 Race Car

During residential school, you will utilise computer aided design and manufacturing software and equipment and to design and make a miniature C02 gas powered balsa wood car. It is an opportunity to develop an understanding of how technology can be used to make your ideas a reality. Completion of this task will enable you to demonstrate how to create cutting paths, set machine parameters, enter computer code, and operate and maintain a CNC router and 3D printer. Hand tools are also applied during the finishing and assembly stages of the course.

The C02 Race Car will be assessed on completion during the residential school. An A4 page of photos of the finished car is to be submitted via Moodle. The photo page is to be submitted online via the Moodle website in the following format:

Last name_First name_C02 Race Car

Please note the C02 Race Car contributes 30% to the overall mark.

Part B - Manufacturing Logbook

During and post residential school, you are required to produce a manufacturing logbook that documents the creation of the miniature C02 race car. The logbook should describe the aim and objectives of each stage of manufacture, as well as outline relevant challenges, solutions, quality control measures and health & safety issues. The logbook will provide evidence of your work in the form of photos, screen shots, videos and annotations.

Your work must demonstrate an understanding and application of computer aided design and manufacture as well as manual finishing processes.

All work is to be collated and presented in the form of a PowerPoint presentation. The Manufacturing Logbook is to be submitted online via the Moodle website in the following format:

Last name_First name_Manufacturing Logbook

Please note the Manufacturing Logbook contributes 20% to the overall mark.

Assessment Due Dates

Item 2A

C02 Race Car **Week 11** Saturday 30th Sept 2017- Submitted via Moodle 23:00 PM AEST

Item 2B

Manufacturing Logbook **Week 12** Friday 6th Oct 2017- Submitted via Moodle 23:00 PM AEST

Return Date to Students Certification of Grades

Weighting 50%

Assessment Criteria

- Ability to produce a quality and well finished product
- Ability to operate CNC Machinery skilfully and safely
- Ability to work autonomously with complex tasks
- Ability to investigate and evaluate the manufacturing process
- Ability to present and communicate work effectively
- Knowledge and understanding of CAD CAM technologies and processes

Referencing Style [American Psychological Association \(APA\)](#)

Submission Online: Upload all files in the Moodle Unit Site

Assessment Due Date

Week 12 Friday (6 Oct 2017) 5:00 pm AEST

Item 2A C02 Race Car Week 11 Saturday 30th Sept 2017- Submitted via Moodle 23:00 PM AEST
Item 2B Manufacturing Logbook Week 12 Friday 6th Oct 2017- Submitted via Moodle 23:00 PM AEST

Return Date to Students

Certification of Grades

Weighting

50%

Assessment Criteria

Students will be assessed on the following criteria:

- Ability to produce a quality and well finished product
- Ability to operate CNC Machinery skilfully and safely
- Ability to work autonomously with complex tasks
- Ability to investigate and evaluate the manufacturing process
- Ability to present and communicate work effectively

Referencing Style

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)

Submission

Online

Submission Instructions

Online: Students are to upload their Manufacturing Log in the Moodle Unit Site

Learning Outcomes Assessed

- Plan and develop a STEM program based on a suite of design and construction activities.
- Apply skills sequences and procedures using CAD/CAM, virtual modelling techniques and appropriate discipline specific teaching techniques.
- Apply problem solving, planning, sequencing, implementing and assessing strategies to STEM applications and processes to promote STEM education including the application of innovation.
- Critically evaluate the design and manufacture of STEM teaching and production processes.
- Apply appropriate workplace health and safety and maintenance practices when engaging in design and manufacturing activities.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

2 Portfolio

Assessment Type

Portfolio

Task Description

Portfolio Assessment

Assessment Title: STEM, 3D Modelling and Design

Task Description

This assessment task consists of three parts:

Part A - Four Quizzes

The initial study of STEM education, its core values, government policy and examples will be examined in four multiple choice quizzes on selected readings and media online. The quizzes require you to investigate the application of Science, Technology, Engineering and Mathematics (STEM) in schools.

Questions will be available on the Moodle website each Monday and remain open until the following Monday at midnight. Students will be allowed a maximum of 60 minutes to complete each quiz. Please note that results from all 4 quizzes contribute to the overall mark of 10%

Part B - Computer Aided Design (CAD) Car Model

You are required to utilize computer aided design (CAD) software, and computational fluid dynamics (CFD) software to model and test a car design. By following the CAD tutorials provided you will be shown how to create and modify a basic race car suitable for side machining using Autodesk Inventor.

To complete this task, you will need to download the CAD software 'Autodesk Inventor Professional' 2016 version and 'Autodesk Flow Design' from the Autodesk Education Community website.

<http://www.autodesk.com/education/free-software/all> You will need your student email address to first register with Autodesk and then download the necessary software

CAD Car model is to be submitted online via the course Moodle website in two parts.

1. The inventor part file (ipt.) titled Last name_First name_C02CAR2 Model
2. The inventor drawing file (idw.) titled Last name_First name_C02CAR Compliance Drawing

Please note the CAD Car model contributes 15% to the overall mark.

Part C - Design Folio Exemplar

Scenario:

You are a teacher at a secondary school and have been asked to run an after school club. The principal has specified it should be STEM based activity and suggested the F1 in Schools challenge. The challenge involves designing and making a miniature F1 race car. The car is to be made from balsa wood and be powered only by a single gas cylinder containing 8 grams of pressurised CO₂. It must be able to travel the 20 metre distance as quickly as possible, and withstand the forces of launch acceleration, track traversing and physical deceleration. In addition, its design and manufacture must adhere to detailed rules and regulations outlined in the 2016-2017-Australian-Technical-Regulations for a cadet class competitor.

As the teacher you have decided to produce a design folio exemplar to be used when teaching the project. The folio is to demonstrate how to approach a design problem following the design process. Your work must demonstrate an understanding and application of the design process, key concepts regarding aerodynamics, F1 in Schools technical rules and regulations, as well as sketching and CAD skills.

Design Folio Exemplar is to be submitted online via the Moodle website in the following format:

Last name_First name_Design Folio

All work is to be collated and presented in the form of a PowerPoint presentation. Please note the Design Folio contributes 25% to the overall mark.

Assessment Due Dates

Item 1A

(Quizzes) **Week 3** Friday 28th of July 2017 – Submitted via Moodle 23:00 PM AEST

Item 1B

CADCAR Model & CADCAR Compliance Drawing **Week 9** Wednesday 13th of Sept 2017 – Submitted via Moodle 23:00 PM AEST

Item 1C

Design Folio Exemplar **Week 10** Friday 22nd of Sept 2017 – Submitted via Moodle 23:00 PM AEST

Return Date to Students Certification of Grades

Weighting 50%

Assessment Criteria

- Knowledge and understanding of STEM in schools
- Understanding and application of CAD & CFD technologies
- Identification and comprehensive description of relevant design criteria
- Thorough comprehension of a range of graphical procedures, principles, and conventions.
- Effective synthesis of ideas to develop effective solutions
- Sophisticated use of a range of graphical skills to produce graphical products
- Insightful evaluation of ideas and valid justification of design decisions.

Referencing Style [American Psychological Association \(APA\)](#)

Submission Online: Upload all files in the Moodle Unit Site

Assessment Due Date

Item 1A (Quizzes) Week 3 Friday 28th of July 2017 – Submitted via Moodle 23:00 PM AEST Item 1B CADCAR Model & CADCAR Compliance Drawing Week 9 Wednesday 13th of Sept 2017 – Submitted via Moodle 23:00 PM AEST Item 1C Design Folio Exemplar Week 10 Friday 22nd of Sept 2017 – Submitted via Moodle 23:00 PM AEST

Return Date to Students

Certification of Grades: Friday 3rd November 2017

Weighting

50%

Assessment Criteria

Students are assessed on the following criteria:

- Knowledge and understanding of design task
- Ability to express and develop an Idea
- Knowledge and application of CAD tools and processes
- Knowledge and application of Technical Rules and Regulations
- Application and evaluation of CFD testing
- Ability to present and communicate work effectively

Referencing Style

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)

Submission

Online

Submission Instructions

Online: Students are to upload their assessment in the Moodle Unit Site

Learning Outcomes Assessed

- Plan and develop a STEM program based on a suite of design and construction activities.
- Apply skills sequences and procedures using CAD/CAM, virtual modelling techniques and appropriate discipline specific teaching techniques.
- Apply problem solving, planning, sequencing, implementing and assessing strategies to STEM applications and processes to promote STEM education including the application of innovation.
- Critically evaluate the design and manufacture of STEM teaching and production processes.

- Apply appropriate workplace health and safety and maintenance practices when engaging in design and manufacturing activities.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?



Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem