

2517QCA

3D Product Modelling CAD 1

Semester 1 - 2006

Academic Organisation:	Queensland College of Art
Faculty:	Queensland College of Art
Credit point value:	10
Student Contribution Band:	Band 1
Course level:	Undergraduate
Campus/Location/Learning Mode:	South Bank / On Campus / In Person Gold Coast / On Campus / In Person
Convenor/s:	Mr Larry Vint (South Bank) Mr Larry Vint (Gold Coast)
Enrolment Restrictions:	Restricted: Approval from Head of School
This document was last updated:	31 January 2006

BRIEF COURSE DESCRIPTION

This course introduces the specialist skills of creating working drawings such as detail drawings, assembly drawings, presentation, layout and composition of designs. Students will be introduced to 3D modelling and computer aided design principles through developing their design skills using digital technology. Using the creative design tools of AutoCAD and 3D Studio Max software, students will develop proficiency in 2D & 3D design and drafting techniques, solid modelling, 3D rendering, and the Australian drawing standards. Assessment will include 2 design projects and an examination.

Restriction: Student must be enrolled in a QCA or GFS Program

SECTION A – TEACHING, LEARNING AND ASSESSMENT

COURSE AIMS

This introductory course prepares students for the rapidly expanding field of computer generated three dimensional design used in industrial applications. Using Autodesk's AutoCAD and 3D Studio Max software, students will be taught fundamental industrial computer generated drawing skills, techniques in conceptualising, 3D modelling, drawing standards, appropriate terminology, construction methods, presentational layout skills and peripherals using computer technology.

LEARNING OUTCOMES

The course prepares students to use the leading industrial technologies to visualise and model abstract concepts, structures, data and terminology used in three-dimensional design. Exercises deal with product, industrial, corporate, lighting, fabric, textile, and furniture design. The course examines strategic technologies that give the competitive advantage to the processes of three-dimensional design, modelling, animation, simulation, and presentation used in industry today.

CONTENT, ORGANISATION AND TEACHING STRATEGIES

In this course students will be using AutoCAD and 3D Studio Max to create 2D and 3D computer generated designs to Australian drawing standards. From these 3D models students will generate working drawings both detailed and assembly, sectional views, pictorial drawings, and rendered 3 dimensional models. They will be taught presentation methods, and computer generated marketing techniques, developing their creative personalities as design professionals. Students will use these technologies as a gateway to developing critical thinking and practical skills necessary within the three-dimensional design context.

The ability to communicate effectively is an essential requirement in every field of endeavor and often our communication requirements are inadequately served by hand drawn designs. Computers are often needed to enable clear and efficient communication, using a combination of computer aided design, modeling, and simulation technology. Designers should be exposed to each of these experiences and be expected to use specialised equipment and software to present drawings in an efficient and accurate way. They should be taught the potential, creative and advanced functions typical of computer aided design and drafting packages and explore the package's features for which it was designed.

In accordance with industrial expectations and requirements, the teaching of computer aided design systems has become a necessity in the area of industrial design. CAD systems give a designer the power and versatility to create with all the benefits of the computer packages design tools; allowing for faster creation, storage, manipulation, display and presentation times that would be nearly impossible to accomplish manually, with astonishing accuracy and higher quality. Complex and sophisticated design problems can be analysed and processed through 3D modelling, animations, simulations, and include such effects as light sources, reflections and shadow analysis on the design itself and its relevant areas. The computer can output the design work in professional and standardised presentations, including multimedia presentations, and can generate construction documents.

Computer aided design has become an essential design tool, providing clients with an accurate visualisation of their proposed concept. These design files can also be connected to rapid prototyping hardware, where the 3D model is commercially produced or a concept model produced through prototyping systems such as stereolithography, lamination, fused deposition, 3D plotting, laser sintering, ground curing, direct production casting or digital light processing.

Weekly contact will be 3 hours, consisting of a 3 hour lecture. Lecture exercises will be aligned with, and assist students in completing two assignments and an examination. Teaching will be through integrated theory, practice and self-paced learning which will occur in a practical computer studio environment. Students are required to attend all lectures.

Assignment work allows students to use the knowledge gained in the course to produce designs based on real life projects. Students are taught the fundamental skills, concepts and techniques required to complete these assignments in the practical studio exercises.

CONTENT SUMMARY

Week	Lecture Content
1.	<i>AutoCAD</i> <ul style="list-style-type: none"> • Introduction to semester & assessment • 2D fundamentals – lines, polylines, shapes, angles • Explore tools – trim, extend, scale, etc • Model & layout environments • AutoCAD settings – preferences, screen settings, views & grids
2.	<i>AutoCAD</i> <ul style="list-style-type: none"> • 2D fundamentals – A3 template design, format, pens, text, layer tools, settings (viewers, facetres, etc) • Australian drawing standards • Orthogonal & pictorial drafting techniques – viewports, paper space
3.	<i>AutoCAD</i> <ul style="list-style-type: none"> • Orthogonal drafting techniques • Discuss working drawings, detail & assembly drawings • Software familiarisation, concepts & techniques
4.	<i>AutoCAD</i> <ul style="list-style-type: none"> • Dimensioning: dimension style, dimension tools, automatic dimensioning, text override, scale • Viewports
5.	<i>AutoCAD</i> <ul style="list-style-type: none"> • Printing setup, bureaus • Export & import features
6.	<i>AutoCAD</i> <ul style="list-style-type: none"> • Creating 3D objects: creating a polyline, extruding a polyline, revolving a polyline, subtracting one 3D object from another • Using imported 3D files • 3D fundamentals
7.	<i>AutoCAD</i> <ul style="list-style-type: none"> • Advanced 3D objects • Creative techniques / design considerations
8.	<ul style="list-style-type: none"> • EXAMINATION Drawing task
9.	<i>AutoCAD / 3DS Max</i> <ul style="list-style-type: none"> • CRITIQUE Assignment 1 • Explore interface • 3DS Max settings – preferences • Importing 2D & 3D AutoCAD designs • Create standard primitives, parameters, zoom tools, select & move, rotate, scale, xyz transitions, explore splines and 3D shapes • Working with modifiers • Free form deformation / boolean / scatter
Mid-semester vacation	
10.	<i>AutoCAD / 3DS Max</i> <ul style="list-style-type: none"> • Working with splines – create, edit, text, extrude, bevel and modify • Design techniques
11.	<i>3DS Max</i> <ul style="list-style-type: none"> • Working with splines continued <ul style="list-style-type: none"> • Lathing splines • Lofting splines • Wrapping a surface around splines • Application of cameras • Application of materials & textures - UVW mapping
12.	<i>3DS Max</i> <ul style="list-style-type: none"> • Application of lights & shadows • Application of cameras

Week	Lecture Content
	<ul style="list-style-type: none"> Application of materials & textures - UVW mapping
13.	3DS Max <ul style="list-style-type: none"> Portfolio drawings – output Photoshop layout techniques
14.	3DS Max <ul style="list-style-type: none"> CRITIQUE Assignment 2 Creating files for printing / publishing Output techniques

ASSESSMENT

Item	Assessment Task	Assessment Criteria	Total Marks	Weighting	Due Day and Time
1.	Examination	<ul style="list-style-type: none"> Interpretation & problem solving of answering test question Demonstrated technical skills Presentation, overall visual impact 	40 40 20 <hr/> 100	20%	Normal lecture time in Week 8
2.	Assignment 1	<ul style="list-style-type: none"> Demonstrated technical skills Demonstrated creativity / innovation / problem solving / evidence of research Presentation, overall visual impact 	40 40 20 <hr/> 100	40%	Friday of Week 9
3.	Assignment 2	<ul style="list-style-type: none"> Demonstrated technical skills Demonstrated creativity / innovation / problem solving / evidence of research Presentation, overall visual impact 	40 40 20 <hr/> 100	40%	Friday of Week 14

Assessment Details

Two major assignments and an examination amend the course.

Assignment work allows students to use the knowledge gained in the course to produce designs based on real life projects. Students are taught the fundamental and advanced skills required to complete these assignments during class exercises.

An examination is given mid-course consisting of the completion of a computer aided drafting design task in a set time period in a hypothetical working environment.

Assessment is based on the objectives within this course. The criteria selected demonstrate the students' ability to research, create and demonstrate practical skills in conceptualising and modelling projects, and present them as a completed product.

Return of Assessment Items and Notification of Availability of Feedback on Assessment

Teaching team will advise of Assessment return and feedback details.

GRADUATE SKILLS

Graduate Skills	Taught	Practis	Assess
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Effective communication (written)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Effective communication (oral)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Effective communication (interpersonal)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information literacy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Problem solving	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Critical evaluation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Work autonomously	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Work in teams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Creativity and innovation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ethical behaviour in social / professional / work environments	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Responsible, effective citizenship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TEACHING TEAM

Convenor Details	
Course Convenor	Larry Vint
Email	L.Vint@griffith.edu.au
Office Location	S02 4.21 South Bank Campus
Phone	(07) 373 53150 / 0409 002 290
Fax	(07) 373 53159
Consultation time	Wednesday afternoon 12-4pm
Additional Teaching Team Members	
Teaching Team Member	Kym Lund
Email	K.Lund@griffith.edu.au
Phone	0413 129 802

COURSE COMMUNICATIONS

The Course Convenor and Teaching Team are available to contact by e-mail or telephone.

Course Resources are available on the Learning@Griffith website.

Students should reference the Learning@Griffith website and their student e-mail regularly for course information and updates.

TEXTS AND SUPPORTING MATERIALS

Lecture booklets and notes will be provided.

Suggested Text Books:

AutoCAD 2006

The Illustrated AutoCAD® 2006 Quick Reference – by Ralph Grabowski

Published by Autodesk Press; 1 edition Paperback only (June 23, 2005)

International Standard Book Number: 141802046X

AutoCAD 2006: One Step at a Time – Part 1 – by Timothy Sean Sykes

Published by The Forager, Download PDF File or Paperback (March, 2005)

International Standard Book Number: B00080I7WK (Digital) / 0976588846 (Paperback)

AutoCAD 2006: One Step at a Time – Part 2 – by Timothy Sean Sykes
Published by The Forager, Download PDF File or Paperback (March, 2005)
International Standard Book Number: B00080I7WU (Digital) / 0976588854 (Paperback)

3D AutoCAD 2006: One Step at a Time - by Timothy Sean Sykes
Published by The Forager, Download PDF File or Paperback (March, 2005)
International Standard Book Number: B00080I7WA (Digital) / 0976588838 (Paperback)

AutoCAD 2006 in 3 Dimensions Using AutoCAD (R) 2006 - by Stephen Ethier & Christine Ethier
Published by Prentice Hall, Paperback edition (April 15, 2005)
International Standard Book Number: 0131714015

3D Studio Max 7

Master Visually 3DS Max 7 (Master Visually) – by Jinger Simon, Richard J. Simon
Publisher: Visual; Book and CD-ROM edition, (May 23, 2005), 640 pages
International Standard Book Number: 0764579924

Exploring 3D Modeling with 3DS Max 7 – by Steven Till, Jim O'Connell
Publisher: Thomson Delmar Learning; Book 1 edition (March 15, 2005)
304 pages, International Standard Book Number: 1401871097

3DS Max 7 Projects: Helping Designers Do More with Less – by Boris Kulagin
Publisher: A-List Publishing; Book edition, (June, 2005), 350 pages
International Standard Book Number: 1931769435

3DS Max 7 Fundamentals – by Ted Boardman
Publisher: New Riders Press; Book & CD-ROM edition, (March 31, 2005)
560 pages, International Standard Book Number: 0321321383

3DS Max™ 7 Bible – by Kelly L. Murdock
Publisher: Wiley; Book and CD-ROM edition (March 7, 2005), 1,296 pages
International Standard Book Number: 0764579711

Standards Association of Australia:

AS 1100.101-1992/Amdt 1-1994 Technical drawing - General principles (1992/ Amdt 1-1994)

AS 1100.201-1992/Amdt 1-1994 Technical drawing - Mechanical engineering drawing (1992/Amendment 1994)

AS 1100.401-1984/Amdt 1-1984 Technical drawing - Engineering survey and engineering survey design drawing (1984/Amdt 1-1984)

AS/NZS 1100.501:2002 Technical drawing - Structural engineering drawing (2002)

AS/NZS 1102.111:1997 Graphical symbols for electrotechnical documentation - Architectural and topographical installation plans and diagrams (1997)

AS 4100-1998/Supp 1-1999 Steel structures (1998/Supp 1-1999)

HB 2.2-2003/Amdt 1-2003 Australian Standards for civil engineering students - Structural engineering (2003/Amdt 1-2003)

HB 108-1998 Timber Design Handbook - In accordance with the Australian Limit State Timber Design Code, AS 1720.1-1997 (1998)

HB 110.1-1998 IMMA Handbook of Engineering Materials - Volume 1: Metals (1998)

HB 12-1996 Metals Index (1996)

HB 17-1996 Metals and alloys - Standard terminology and nomenclature (1996)

ISO 128-21:1997 Technical drawings - General principles of presentation - Part 21: Preparation of lines by CAD systems (1997)

ISO 128-1:2003 Technical drawings - General principles of presentation - Part 1: Introduction and index (2003)

ISO 1302:2002 Geometrical Product Specifications (GPS) - Indication of surface texture in technical product documentation (2002)

ISO 7200:1984 Technical drawings; Title blocks (1984)

Web Sites:

Software

<http://www.autodesk.com.au>. (Autodesk AutoCAD Australian/New Zealand home page)

<http://www.autodesk.com/autocad> (Autodesk AutoCAD home page)

<http://www.discreet.com>. (Autodesk Media & Entertainment Solutions, 3D Studio Max home page)

<http://www.rhino3d.com>. (Robert McNeel & Associates, Rhinoceros home page)

<http://www.artissoftware.com> (Texture Magic Pro, creates seamless textures)

<http://www.darksim.com> (Site to order Dark Tree Textures CD; 200 shaders / textures for 3D Studio Max, Lightwave & Animation Master. Site includes gallery, and samples of abstract pictures, animations, materials, structures and tiles.)

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