BACHELOR OF ARCHITECTURE & ENVIRONMENTS

Course Overview
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BAE COURSE DESCRIPTION

The Bachelor of Architecture and Environments (BAE) offers you a career pathway into the future of architecture, design, construction and urban planning. With this multi-disciplinary program, you can access a wide range of professions in the field of architecture and the built environment. Whether you choose to graduate with this course, or proceed to one of our range of professional master’s courses, the BAE provides you with the skills and knowledge to operate successfully in today’s complex and globalized construction industries.

Design, collaborations and interdisciplinary teamwork are central to the BAE degree, and taught as a series of Design Integration Labs with a disciplinary lens; the DIL Materials (Architecture), the DIL Energy (Architectural Science), the DIL Urban (Urban Planning), and the final Capstone Project for Graduation (Architecture/Arch Science or Architecture/Urban). You will learn the latest 3D modelling and scripting techniques for developing your designs, and evaluate by using cutting edge simulation and performance software.

Your studio-based classes are paralleled with intensive practical work in the highly specialized and unique labs of the Faculty of Architecture, Design and Planning; the Audio and Acoustics Lab, the Lighting Lab, the IEQ Environmental Quality Lab, and the DMaF Advanced Manufacturing and Fabrication Lab. In addition to design, you will also be able to engage further in core studies and an elective range that teach: architectural history and theory; property development; traditional and experimental structural principle; building material properties; and best practice construction. Importantly, you will develop a thorough understanding of the collaborative relationship between architects, urban planners, urban designers, heritage conservation, property developers, engineers, construction managers and other built environment professionals. This will provide you with a clear advantage in an industry that is becoming increasingly multidisciplinary.

Welcome.
COURSE PROGRESSION

4 Disciplines

Design Lab
HISTORY AND THEORY
ARCHITECTURAL TECHNOLOGIES
ARCHITECTURAL SCIENCE
URBAN PLANNING AND DEVELOPMENT

Year 1
S1

Designs: Design Thinking 1
BEDC1001 Architectural Communications 1001
BEDC1001 Architectural Sketching and Drawing

S2

BACHELOR OF ARCHITECTURE & ENVIRONMENTS Full course description 2017

Year 2
S3

LIVE2001 Design Integration Lab Materials
BEDC2001 Architectural Technologies 1
BEDC2001 Architectural Technologies 2
BEDC2001 Architectural Technologies 3
BEDC2001 Architectural Technologies 4
BEDP2002 Property and the Built Environment
BEDP2002 Urban Environments

Year 3
S4

BEDP2001 Designing for Sustainability
BEDP2002 DIL Energy
BEDP2002 DIL Urban Environments
BEDP2002 DIL Urban Environments

Year 4
S5

BEDP2001 Designing for Sustainability
BEDP2002 DIL Energy
BEDP2002 DIL Urban Environments
BEDP2002 DIL Urban Environments

Year 5
S6

BEDP2001 Designing for Sustainability
BEDP2002 DIL Energy
BEDP2002 DIL Urban Environments
BEDP2002 DIL Urban Environments

Design Sequence through BAE: Design projects or Exercises with individual or group projects, via disciplines.

Foundation > Specification > Graduation
CORE UNITS

BAE Bachelor of Architecture and Environments

2017
DECO1006 Design Thinking  
(core unit, Y1 S1)

Credit points: 6  
Teacher/Coordinator: Madeleine Borthwick  
Session: Semester 1  
Classes: Lecture 1 hr/wk, Workshop 2 hrs/wk  
Prohibitions: IDEA9106  
Assessment: Design Assignments (80%), Quizzes (10%)  
Mode of delivery: Normal (lecture/lab/tutorial) day

This unit of study provides an overview of a human-centred approach to the design of interactive technologies. It introduces students to design thinking and how it can be productively applied to different design situations. The theoretical concepts, methods and tools for the key stages of interaction design are covered including user research, ideation, prototyping and user evaluation. It provides students with the principles, processes and tools for working on human-centred design in studio projects. Students learn to build empathy with users, identify and reframe the problem space, develop value-driven design concepts and persuasively communicate design proposals with an emphasis on the user experience through visual storytelling.

BDES1011 Architectural History/Theory 1  
(core unit, Y1, S1)

Credit points: 6  
Teacher/Coordinator: Prof. Michael Tawa and Assoc. Prof Lee Stickells  
Session: Semester 1  
Classes: Lecture and tutorial contact, plus self-directed preparation and assignments, for a minimum total student commitment averaging 9 hours per week.  
Prohibitions: DESA1102  
Assumed knowledge: HSC Mathematics and HSC English Standard  
Assessment: Seminar discussion leadership (individual, 30%); Building study (group, 60%), Overall participation (individual, 10%).  
Mode of delivery: Normal (lecture/lab/tutorial) day

Architectural History/Theory 1 introduces students to the discourse of architectural history and theory. It commences with a concise chronological survey of key periods of architectural history from antiquity to the mid-nineteenth century, providing an overview of the scope of the field and establishing initial points of reference. It then changes focus to investigate more closely the ways in which particular architectural themes and ideas traverse across history, coming to the fore in certain periods and receding in others. Students will interrogate these themes in small groups through intense study of a single significant building, which they will research, document and illustrate in a written report, and re-construct in a suite of finely crafted scale models. They will be introduced to fundamental principles and skills of scholarly research, including locating and evaluating sources, and constructing arguments. This unit of study aims to introduce students to the field of architectural history and theory, and, in doing so, to help develop fundamental skills in scholarly research, discourse and writing that will be required at university.
AWSS1001 Architectural Sketching and Drawing  
(core, Y1, S1)

Handbook Entry:
Credit points: 6  
Teacher/Coordinator: Koji Rui  
Session: Semester 1  
Classes: Workshop 3 hrs/wk  
Prohibitions: DESA1601, DESA1602  
Assessment: Portfolio of works (60%); process journal (40%)  
Practical field work: Studio practice  
NB: Students may incur costs for materials in some units.  
Mode of delivery: Normal (lecture/lab/tutorial) day  
Note: Students may incur costs for materials in some Art Workshops units.

This unit aims to provide the student with the knowledge, skills and aptitude required to use a range of fundamental architectural sketching and drawing skills based on observation of the physical world, in particular the built world. Students will be encouraged to develop a commitment to the practice of drawing as a fundamental design skill through 13 studio classes coupled with independent study. The workshop places an emphasis on keen observation, experimental use of materials and engagement with historical frameworks used in design practice in design and architecture. Exposure in studio to the sensitivities offered by different drawing materials and techniques will give students the competency to more confidently use drawing as a communication device. Skills in perspective drawing are introduced and drawing is used to document the visible world and define structure and detail. On successful completion of this unit of study students will have demonstrated familiarity with a range of drawing media and techniques, including charcoal, graphite, pen, brush and ink, and an introduction to colour. Students will understand the importance of maintaining a sketchbook as a site to record all their visual and conceptual research, and in which to draw on a daily basis as a means to develop ideas and technical proficiency.

BDES1012 Architectural Communications 1  
(core unit, Y1, S1)

Handbook Entry:
Credit points: 6  
Teacher/Coordinator: tba  
Session: Semester 1  
Classes: Lecture, computer laboratory and studio contact, plus self-directed preparation and assignments, for a minimum total student commitment averaging 9 hours per week.  
Prohibitions: DESA1001  
Assumed knowledge: HSC Mathematics and HSC English Standard or equivalent  
Assessment: Assignments (70%), Portfolio (30%)  
Mode of delivery: Normal (lecture/lab/tutorial) day

Architectural Communications 1 introduces students to fundamental modes of communication that are used to comprehend, conceive, explore, articulate and document architecture. It covers the domains of sketching, technical drawing, model making, verbal and written communication, diagramming and photography. It both familiarises students with necessary technical skills and encourages their creative deployment through practical experimentation.
BADP1001 Empirical Thinking  
(core unit, Y1, S2)

Credit points: 6  
Teacher/Coordinator: A/Prof William Martens  
Session: Semester 2  
Classes: Lectures - 1.5 hrs per week; Lab - 1.5 hrs per week. Corequisites: BDES1023 and DAAE1001  
Assumed knowledge: DECO1006 and DECO1012 and BDES1011 and AWSS1001  
Assessment: Assignment 1 (20%); Assignment 2 (30%); Exam (50%)  
Mode of delivery: Normal (lecture/lab/tutorial) day

This unit of study introduces approaches to thinking and working in the built environment that are based on measurement, analysis and modelling. There are many aspects of the built environment that can be expressed quantitatively - but how do we measure them, how certain can we be of particular values, how can we develop an understanding of them from the data, how can this understanding be applied in modelling and simulation (potentially for use in design), and what are the practical uses (and limitations) of an empirical approach to architecture and design? Beginning with the quantification of physical features through measurement, the unit examines uncertainty in measurement, relationships between physical and psychological domains, statistical modelling techniques, and information representation including visualisation and high-resolution simulation of environments. Assessment tasks and case studies in this unit focus on problems in the built environment, such as spatial data, material properties, the effects of the environment on people, and the development of mathematical models and realistic simulations of indoor or public spaces. Students will develop skills, knowledge and understanding enabling them to work effectively with quantitative data in design and analysis of the built environment. Conceptual, mathematical and computational abilities are developed.

BDES1023 Architectural Technologies 1  
(core unit, Y1, S2)

Credit points: 6  
Teacher/Coordinator: Michael Muir  
Session: Semester 2  
Classes: Lecture and tutorial contact, plus self-directed preparation and assignments, for a minimum total student commitment averaging 9 hours per week. Prohibitions: DESA1102  
Assessment: Assignments (60%), Exam (40%)  
Mode of delivery: Normal (lecture/lab/tutorial) day

Architectural Technologies 1 introduces students to the roles that environmental considerations, structures and construction play in architecture. The fundamental concepts underpinning each of these key areas are presented and students demonstrate their developing knowledge of them via project-based assignments. These progressively complex tasks initiate students to the knowledge required to successfully analyse and synthesise construction and technical systems in basic buildings.
DAAE1001 Living Cities  
(core unit, Y1, S2)

Credit points: 6  
Teacher/Coordinator: Dr Adrienne Keane  
Session: Semester 2

Classes: Lectures - 2 hrs per week and 1 hr tutorials weeks 1-6; Lectures - 1 hr per week and 2 hr tutorials Weeks 7-13.  
Corequisites: BDES1023 and BADP1001  
Assumed knowledge: DECO1006 and DECO1012 and BDES1011 and AWS1001  
Assessment: Assessment 1 (30%); Assessment 2 (30%); Assessment 3 (40%)  
Mode of delivery: Normal (lecture/lab/tutorial) day

This unit of study aims to review the challenges and issues involved in planning for the contemporary urban environment from an urban planning perspective, including urban design and heritage lens. The unit examines the evolution of towns and cities from the first settlements to the modern metropolis, and looks at the forces that shape the urban environment. It asks, 'why did cities evolve?', 'what purposes does the city serve?', 'who is the city for?', and 'how are decisions made about cities?' The unit explores the cultural, economic and political drivers that inform the making of the contemporary built environment as a dynamic and continually evolving 'living city'. The Unit examines planning in the modern and pre-modern eras, and the varying social, cultural and physical environments in which cities have evolved so as to demonstrate its relevance to architects, planners, urban designers and other stakeholders involved in creating the urban environment. On the successful completion of this unit of study, students will have demonstrated an understanding of the importance of planning in shaping our towns and cities through time, plus acquired a basic knowledge of planning methods and approaches used in formulating planning and urban design proposals.

BAEN1001 Design in Architecture  
(core unit, Y1, S2)

Credit points: 6  
Teacher/Coordinator: Dr Dagmar Reinhardt  
Session: Semester 2

Assessment: (30%) weekly exercises individual work, (30%) design project group work, (40%) portfolio  
Mode of delivery: Normal (lecture/lab/tutorial) day

This unit of study will give the student an understanding of design of a small scale building in an urban context. It teaches the foundations for an interdisciplinary design process between the fields of architecture, architectural science, and urban planning. It is undertaken in a variety of analogue and digital design techniques in order to better understand architecture's qualities including typology, scale, proportion, structure, program and materiality. This unit investigates the complexities of architectural design, from concept development to aspects including programmatic, structural, material requirements in respect to spatial implications, to limitations of a particular site, and to city condition. It equips students with conceptual tools and design skills from analogue modelling and graphic representation to digital drafting, rendering and fabrication, and verbal and written communication. This enables students to develop a project for a small architectural design through interactive design variations guided by a diverse set of criteria. On the successful completion of this unit of study, students will have demonstrated: an understanding of the architectural design process; an understanding for small scale architecture project; and an ability to express concepts and designs clearly and cohesively across a range of representation media.
BAEN2001 Design Integration Lab: Materials  
(core unit, Y2, S1)

Credit points: 6  
Teacher/Coordinator: Dr Matthew Mindrup  
Session: Semester 1  
Classes: 1hr lectures/week, 2hr studios/week, 1hr tutorials/alternate week  
Corequisites: BADP2002 and BADP2003  
Assessment: (30% 20%) individual work, (20% 50%) design project, (50% 30%) design portfolio including 1000w essay  
Mode of delivery: Normal (lecture/lab/tutorial) day

Design Integration Lab: Materials introduces students to the role of materials as a proponent of architectural form. The objective of this unit is to equip students with an ability to think critically about the transformation, evaluation and creative application of different materials in terms of environmental, structural and aesthetic performance. In-class lectures and assignments provide students with an opportunity to explore fundamental concepts about material propensity, material performance and material scale as a conceptual and practical basis for architectural design. To this end, students will also be exposed to local industry partners who share the Faculty’s interest in developing innovative and sustainable practices with the use and reuse of materials in the built environment. An introduction to nanomaterials, biomimicry and the fundamentals of structural design will be offered. To facilitate the dialog between material and form in architecture, students will engage in a progressively complex semester-long design project employing a limited material palate. Upon successful completion of this unit students will be provided with the necessary skills for thinking with materials as a determinant of architectural form. This unit of study aims to introduce students to the history and theory of using physical architectural models to both project and describe buildings or their parts in three-dimensions. In doing so, it aims to help develop fundamental skills in design, use of models in architectural design practices, scholarly research, discourse and writing that will be required at university.

BADP2002 City Form and Development  
(core unit, Y2, S1)

Credit points: 6  
Teacher/Coordinator: Dr Adrienne Keane  
Session: Semester 1  
Classes: 2 lectures/week, 1hr tutorials/week  
Prerequisites: DAAE1001 Living Cities DESC9014 Building Construction Technology  
Corequisites: BAEN2001 and BADP2003  
Assessment: (30%) individual work critical review, (20%) group work presentation, (40%) portfolio, (10%) participation and tutorial exercises  
Mode of delivery: Normal (lecture/lab/tutorial) day

This unit builds on the content of Living Cities and introduces students to the modern formal domains of planning, urban design and heritage conservation. The focus will be on two main areas of debate, namely, city form and structure, and secondly, the planning and development processes on which the formal planned city is made. The unit will establish the context in which the role of planners, architects and urban designers in the process of building the ‘incremental’ city is understood, from the site to precinct, neighbourhood and city wide levels. Elements of city form and structure are analysed, as well as mobility, transport, land use, infrastructure and current policy responses at a metropolitan and local level in meeting urban growth needs. The unit will also overview the development process including the framework in which architects, planners and property developers must work. Using a contemporary planning framework, the nature of development assessment, strategic planning and the community’s role within this framework are explored. Criticisms and reform agendas around frameworks will be examined. Informal urbanism is also introduced in this unit to address development that occurs outside the domain of formal western regulated planning and design systems.
BADP2003 Light and Sound
(core unit, Y2, S1)

Credit points: 6
Teacher/Coordinator: Assoc Prof. Densil Cabrera
Session: Semester 1
Classes: 2hr lectures/week, 1hr tutorials/week
Corequisites: BAEN2001 and BADP2002
Assessment: (25%) written report group work, (35%) written report individual work, (40%) written report individual work.
Mode of delivery: Normal (lecture/lab/tutorial) day

This unit of study develops a working understanding of light and sound from physical and sensory perspectives, and of the ways that buildings and building elements affect these. These are examined in terms of their sources, transmission, digital representation, and sensation. Theories that allow students to develop practical designs and predictions are introduced. Theoretical learning is reinforced by computational data processing and analysis. Standards, regulations and recommendations concerning light and sound in the built environment are introduced. Consideration is given to their roles in human communication, and how architectural environments can contribute to these.

BAEN2002 Design Integration Lab: Energy
(core unit, Y2, S2)

Credit points: 6
Teacher/Coordinator: Dr Christhina Candido
Session: Semester 2
Classes: 1hr lectures/week, 2hr studios/week, 1hr tutorials/alternate weeks, 1hr lab/alternate weeks
Corequisites: BADP2001 and BDES2013
Assessment: (25%) assignment, (25%) 1500wd report, (50%) presentation & portfolio
Mode of delivery: Normal (lecture/lab/tutorial) day

This design and lab-based studio will focus on the ways that buildings respond effectively to people’s environmental needs, while minimising net energy use in small-scale settings. Students will learn how to integrate and design the thermal, luminous and acoustic environment of a small-scale building. Particular emphasis will be placed on the basics of heat, thermal performance and natural ventilation strategies. In learning how to assess environmental performance, students will be equipped with the required knowledge to design convenient, quick and robust solutions that improve the experience and service of the building. An introduction to sustainable building practices, including net-zero and green building, will provide a basis for further investigation of the critical needs faced by occupants of the built environment. Particular emphasis will be placed on lab-based experiments and case studies in the Sydney area, with questions raised about the Australian context more broadly. The main learning outcomes include an understanding of fundamental principles of integrated strategies and solutions, principles of passive low-energy design techniques (including heat, sound, light and wind), the ability to critically and synthetically analyse environmental design issues, the ways to efficaciously implement and communicate technical information during the design process.
BDES2013 Architectural Technologies 2
(core unit, Y2, S1)

Credit points: 6
Teacher/Coordinator: Michael Muir
Session: Semester 1, Semester 2
Classes: Lecture and tutorial contact, plus self-directed preparation and assignments, for a minimum total student commitment averaging 9 hours per week.
Prerequisites: BDES1023
Corequisites: BDES2026
Prohibitions: DESA2111
Assessment: Assignments (60%), Exam (40%)
Mode of delivery: Normal (lecture/lab/tutorial) day

Architectural Technologies 2 explores the roles that environmental considerations, structures and construction play in moderately complex medium-scale buildings. Emphasis is placed on developing in students an active awareness of the impact that technical and constructional decisions have on architectural design. Architectural Technologies 2 explores the role that environmental, structural and constructional considerations play in moderately complex small-scale buildings. Attention is paid to the impact that choices of materials, detailing, structural systems and energy systems, whether passive or active, have on architectural design. Through project-based learning, students develop an active awareness of the important role that appropriate technical and constructional decisions, including architectural details, play in terms of fulfilling conceptual ambitions in tangible works of architecture. Students develop and demonstrate their developing appreciation of these issues via case study analysis, a group project, individual technical drawings and a final examination. Students develop and demonstrate their awareness of these issues via the analysis of case studies, a large project-based assignment, and a final exam.

BADP2001 Algorithmic Architecture
(core unit, Y2, S2)

Credit points: 6
Teacher/Coordinator: Dr. Rizal Muslimin
Session: Semester 2
Classes: 1 lecture/week, 3hr tutorials/week
Prerequisites: -
Corequisites: BAEN2XXX Design Integration Lab: Energy
BDES2013 Architectural Technologies 2
Assessment: (25%) individual work critical review, (30%) group work presentation, (35%) group work presentation and portfolio
Mode of delivery: Normal (lecture/lab/tutorial) day

This unit of study introduces methods for developing a virtual building model as an integrated and interactive tool for architectural design decision-making. Architectural modeling can no longer be understood simply as the digital drafting of 3D geometries or the physical construction of a scaled miniature. Virtual building modeling incorporates increasingly complex and interconnected sets of data. In this unit, modeling is construed as the formation of an architectural problem. This includes defining data and variables across scales and disciplines, as well as converting data into meaningful information for architectural analysis, synthesis and evaluation. This unit develops knowledge of fundamental concepts of algorithmic architecture, including BIM. Students are exposed to various ways in which it can be used, and develop their understanding through a series of digital modeling exercises.
BDES3023 Architectural Technologies 3  
(core unit, Y3, S1)

Credit points: 6  
Teacher/Coordinator: Dr Stewart Lawler/ needs to be confirmed  
Session: Semester 1  
Classes: Lecture and tutorial contact, plus self-directed preparation and assignments, for a minimum total student commitment averaging 9 hours per week  
Prerequisites: BDES2013 or DESA2111  
Corequisites: BDES3010 and BDES3011  
Prohibitions: DAAP3002  
Assessment: Assignments (60%), Exam (40%)  
Mode of delivery: Normal (lecture/lab/tutorial) day  
Note: Department permission required for enrolment

Architectural Technologies 3 develops in students an advanced understanding of moderately complex building systems. It addresses the technical design of buildings in their entirety and in their details, through the three interrelated perspectives of environment, structures and construction. As in Architectural Technologies 1 and 2, primary emphasis is placed on developing an understanding that appropriate formal architectural solutions can be the outcome of technological considerations and that, reciprocally, technical solutions can not only support but inform conceptual ambitions. A major project-based assignment, a case study analysis, individual technical drawings and a final examination are used as the vehicles for students to demonstrate the knowledge that they have gained in analysing and synthesizing the various considerations that are to be addressed in the design of a building system that appropriately responds to, and integrates, the three key technical considerations of environment, structures and construction.

BAEN3001 DIL: Urban  
(core unit, Y3, S1)

Credit points: 6  
Teacher/Coordinator: Dr Adrienne Keane  
Session: Semester 2  
Classes: 1hr lectures/week, 3hr studios/week.  
Corequisites: BDES3013 Arch Tech 3 and BADP2xxx Designing for Env Qual.  
Assessment: (20%) individual work, (40%) place making preliminary design project group work, (40%) place making final report group project.  
Mode of delivery: Normal (lecture/lab/tutorial) day  
Mode of delivery: Normal (lecture/lab/tutorial) day

Design Integration Lab: Urban Environments builds on the content of Living Cities and City Form and Development. It introduces students to the concept of “place” and the planning and design interventions that impact places. In addition, the unit aims to give students the experience of working in multi-disciplinary teams to mirror potential future work environments. The unit will focus on one particular location chosen for its complexity in terms of the range of contemporary issues within an urban context. Developing urban design skills and enhancing strategic planning knowledge, students will investigate a location and seek to design a public space, including different built forms and elements, based on their own strategic plan. The outputs will be developed while working on individual and group tasks. Students will be challenged as if in a work environment of professionals looking to resolve urban issues.
BADP3002 Property and the Built Environment  
(core unit, Year 3, S2)

Credit points: 6  
Unit Coordinator: Dr Stewart Lawler  
Semester 1  
Classes: 1.5 hours lecture/week, 2hr tutorials/week  
Prerequisites: DAAE1001  
Corequisites: BAEN2001 and BADP2003  
Assessments: Structure of a development project (25%), Preparation of construction estimate (25%), Property Development report in groups (50%)  
Mode of delivery: Normal (lecture/lab/tutorial) day

An introduction to the Property Development (PD) process in the context of the Architect with the aim of assisting students in understanding the Professional’s role in the process. This is provided through clarification and review of the stages involved in the process with an overview of the different sectors, project types and stakeholders involved. This will lead onto an introduction to the broad objectives of financial feasibility preparation and an insight as to why certain projects are developed, which is more often driven by feasibility results rather than by the design. An overview of risk factors which may be encountered through the PD process involving risk assessment/management, risk matrix preparation and possible counter measures. The Unit will include how to identify basic construction types, prepare construction costings from industry standard publications with an overview of the structure of the construction industry and a synopsis on project stakeholders and the hierarchy of a construction project. It is envisaged students will be able to identify the major stakeholders in the PD process, prepare initial construction costings and project feasibility reports outlining possible risks with mitigation measures.

BADP3001 Designing for Environmental Quality  
(core unit, Y3, S1)

Credit points: 6  
Teacher/Coordinator: Dr Christhina Candido  
Session: Semester 1  
Classes: 1hr lectures/week, 2hr tutorials/week  
Corequisites: BAEN2001 and BADP2002  
Assessment: (25%) written report group work, (35%) written report individual work, (40%) written report individual work  
Mode of delivery: Normal (lecture/lab/tutorial) day

This unit of study will focus on Indoor Environmental Quality and how it may affect people’s experience and perception of their surrounding built environment. Students will be exposed to key IEQ dimensions, including thermal, visual and acoustic comfort and indoor air quality. Particular emphasis will be given on Post-Occupancy Evaluation (POE) tools, studies and research findings. The evolution of contemporary workspace design and its impact on building occupants’ satisfaction, productivity and health will also be explored. Students will also learn how IEQ has been incorporated by certification and rating schemes. Upon completion of this unit, students will have the ability to critically and synthetically analyse IEQ-related issues, and how to efficaciously implement and communicate the technical information during the design process and/or performance assessments.
BAEN3002 DIL: Capstone Project
(core unit, Y3, S2)

Credit points: 6
Teacher/Coordinator: Dr Dagmar Reinhardt, Dr Christhina Candido, Dr Adrienne Keane
Session: Semester 2
Classes: 1hr lectures/week, 5hr studios and labs/week
Corequisites: BADP2xxx
Assessment: (30%) individual work, (20%) individual design project, (50%) design portfolio including 1000w essay
Mode of delivery: Normal (lecture/lab/tutorial) day

As the culminating design studio for the degree, the capstone project combines knowledge, criteria and methods of the disciplines of Architecture, Urban Planning, and Architectural Science. Students are presented with the opportunity to express and represent their own positioning through the analysis for and design of a sufficiently complex building, city structure, or town center. The studio consolidates the students’ abilities in identifying and solving problems and critical aspects for architecture and the built environment using a range of advanced modeling, simulation and optimization techniques and methods. The aim for students is to produce integrated and compelling pre-professional architectural design projects prompted by the critical reflection of city, policy, site, heritage, scale, program, thermal comfort, material, construction, structure, light, and acoustics. With completion of this unit, students demonstrate their understanding of a spectrum of architectural practice and the built environment, including architectural design, history and theory; urban design, planning and policy; and architectural science aspects such as energy, light, construction and acoustics, services, and heritage. By specializing in a select suite of these aspects, students prepare for career-pathways as offered by the faculty’s full range of postgraduate courses.

BDES3025 Architectural Professional Practice
(recommended elective/ gateway Master of Architecture - Prerequisite unit of study, Y3, S2)

Credit points: 6
Teacher/Coordinator: Suzanah Potts
Session: Semester 2
Classes: Lecture and tutorial contact, plus self-directed preparation and assignments, for a minimum total student commitment averaging 9 hours per week.
Corequisites: BDES2027
Assessment: Reports (20%), Assignment (80%)
Mode of delivery: Normal (lecture/lab/tutorial) day

Architectural Professional Practice introduces students in the final semester of their undergraduate degree to the professional practice of architecture, focusing on design development within regulatory and practice management frameworks. Students are introduced to the fundamental principles of key regulatory requirements and critically deploy their understandings by investigating local practice case studies. They further develop a capacity to apply their knowledge in a particular context through an architectural design project that they take to Development Application level using current best practice.
The Faculty and the Discipline of Architecture offers an exciting and unique suite of research-based electives each semester and during certain intervals that interrogate architecture as a socio-political and representational tool for understanding the world. The electives are available to junior, senior and postgraduate students throughout the Faculty and University by permission.

The electives fit into a long-ranging trajectory for the Faculty that positions architecture at the forefront of global debates concerning how the built environment engages with and responds to technologies of making, histories of seeing, and the crafting of intellectual histories.

Electives at all levels will respond to emerging practices in the field from a number of disciplines, perspectives, and chronologies based on the expertise of the individual staff members coordinating the units.

Within this arrangement, it is hoped that all students will be able to tailor their own interests and pursuits in a far more engaged manner. While a number of current electives will remain available to all students, the new electives provide scope for pursuing specific topics and techniques that complement your ongoing work in other core and non-core units in the Faculty.

Intensives, including design-build opportunities, travel and international curatorial roles, offered during interim periods will allow students to be challenged further afield in diverse locales and conditions.
UNDERGRADUATE ELECTIVES

Semester 1

DESA3003 Architectural Detailing

Michael Muir
(senior undergraduate by application)

Spending time on building sites in addition to the study of detailing and its implementation during construction on site are invaluable learning experiences for all architectural students. However, access to operative building sites is generally limited by OH&S concerns, many students have no available path to gain access to builders & architects. This studio-based elective will allow a small group of students access to a current building project to explore the role of the detail (in design and building) in guiding not only a small component of a building’s construction but also its fundamental overall character. This elective will link students to a particular architect, builder and project to study and document a series of details in the context of the whole building.

DESA3005 Architectural Drawing Through History

Dr Ross Anderson
(senior undergraduate by application)

In Architectural Drawing Otherwise students critically investigate and then imaginatively deploy in a studio project an unconventional historical drawing technique of their choosing. Close studies of the widely differing range of drawings that were produced to achieve the architecture of Ancient Egypt, Classical Greece and Rome, the Middle Ages, Renaissance and Baroque, can illuminate aesthetic sensibilities that are often profoundly different to our own, and can provide insights into the worldviews of the cultures that produced them. Drawings are a vital mediator between that which can be imagined and that which can be built, and the elective contributes to architectural historian Robin Evans’ claim that it would be possible to “write a history of Western architecture that would have little to do with either style or signification, concentrating instead on the manner of working.” Students conduct textual and graphic analyses of case study drawings and buildings, but engage equally in practical experimentation in an effort to unfold and reanimate the potential of forgotten or marginalised drawing techniques to inform current architectural practice.

DECO2103 3D Modelling and Fabrication

Dr Caitilin de Berigny

This unit teaches students an understanding of the basic concepts of modelling and prototyping 3D artefacts. Students will develop skills in creating and using 3D models for various stages of a design process. The unit further introduces students to rapid prototyping fabrication techniques, such as 3D printing and laser cutting with the aim to understand how to prepare a digital representation of artefacts (such as digital products or packaging). Students will learn how physical artefacts are represented in 3D digital models by modelling various 3D geometric entities, and how to create photorealistic images that accurately and efficiently describe intent, structure, and geometric and surface variations of 3D models. Key concepts covered in this unit include: boundary representations, solid and parametric modelling, texture mapping, light sources, camera locations and projections.

DESA3010 Code to Production

Dr Dagmar Reinhardt

Code to Production is an elective that explores the potential of an iterative design process from parametric variations; to analysis and simulation; to digital manufacturing and fabrication. The course has a two-fold agenda: to examine the performance of complex geometries available through computational design processes, and to translate the optimised design to digital manufacturing into construction and prototype (CNC/robotic fabrication). Based upon the development of a series of controlled variations derived through parametric and scripting methods, the elective aims to further expand an understanding of structural and acoustic performance of these geometries. It reviews an open system of design research in which design process, structural analysis and acoustic analysis are deployed to improve the acoustic and structural performance of complex spatial geometries, and derive fabrication knowledge for architectural practice. The unit of study extends students’ knowledge of advanced computational design, interdisciplinary processes and fabrication methodologies by application of commercial and specialist 3D-modelling, scripting, analysis and manufacturing packages (including various software such as McNeel Rhino and Grasshopper, Karamba, RhinoNest and KUKA/prc).
UNDERGRADUATE ELECTIVES

Semester 2

DESA3008 Architectural Models: Theory and Practice
Dr Matthew Mindrup

This unit of study asks students to consider ‘what is a physical model in architecture?’ and ‘what are the different materials, methods and uses of physical models in the design and presentation of architecture?’ Participants in this unit will critically investigate and creatively apply a non-conventional modeling technique of their choice in the conception, study or presentation of architecture. These inquiries are supplemented by lectures and in-class discussion, which seek to uncover a historical and contemporary use of physical models as a tool for architects, including their mention in architectural treatises and in the formation of Modernism. In recent years, the development and use of parametric driven architectural models has received significant attention. Naturally, the unit will also explore the interface between the physical and virtual model to understand how architectural modeling programs belong to a historical tradition and are playing a role in not only representing conditions of building in the world but also in the development of new architectural ideas.

DESA3009 Advanced Fabrication
Dr Simon Weir
(basic 3D modelling and fabrication knowledge required)

This design elective bridges the domains of design theory and advanced fabrication practices. In this unit students will make complex and polished objects using the fabrication tools in the DMaF lab, that demonstrate and/or embody design ideas intrinsic to their formulation. The unit is divided into two halves: additive fabrication and subtractive fabrication. Each half will be accompanied by lectures on the technical knowledge related to these fabrication processes, and lectures on the theoretical premises and associations generated by the internal logic, and expressive languages of each fabrication type. Tutorials will also be divided between technical developing machine control, and design tutorials in which students will develop control of the design trajectory and expressive languages.

DESA3011 Introduction to Building Construction
Michael Muir

This unit covers three related areas of investigation: basic construction practices, advanced building construction practices and sustainable construction. It begins by introducing a number of recurrent themes in construction in Australia at the present time including the idea of building culture, the various modes of delivery and variety of classifications of buildings and building elements, rational construction and construction detailing from first principles. There follows a review of construction techniques of domestic scaled buildings using, where appropriate, examples of well documented and/or accessible exemplars. The second part of the unit reviews current approaches to building technologies employed in more complex public and commercial scaled buildings, particularly with regard to processes of structural system selection, facade systems design and construction and material performance. The fundamentals of heat transfer and effects of external conditions on indoor comfort, aspects of the BCA and integration of services into the building fabric relevant to building services engineers will also be reviewed. Again, accessible exemplars will be covered. Finally the unit will review current issues related to key attributes of buildings which make them sustainable, particularly with regard to material selection, appropriate detailing or energy and resources conservation and building reuse and recycling.

DAAE2008 Innovative Building Structures
Richard Hough
(junior/senior elective)

The aim of this unit is to engage students in detailed studies of innovative building structures, covering the three aspects of innovation in architectural and structural design (modelling, materials and technology). The main topics covered are: Architectural Form and Structural Function; interpretation of basic (arch, beam, column, space and spatial portal) and advanced (truss, vault, dome, shell) structural principles with an intuitive graphical method (Load Path Method - LPM). Examples of significant case studies will be shown and interpreted (works by A. Gaudi, B. Fuller, F. Otto, N. Grimshaw, S. Calatrava, N. Foster, R. Piano and others); Biomimetics; bioinspired structures as a way to increase structural efficiency. Innovative structural materials: the use of glass as structural material, innovative reinforcements for composite structures, smart and nanostructured materials; Kinetic architecture: structural movement as the 4th architectural dimension. A case study assignment will be used to assess student’s competence in investigating and presenting case studies and being able to identify and evaluate issues and factors contributing to innovative structural solutions.
20th Century Australian Architecture
Prof Andrew Leach
(recommended elective)

The unit will introduce students to a range of architectural styles and aspirations in Australia. Lectures and seminars will cover key buildings representative of their period. At the conclusion, students will be familiar with a range of styles and their characteristics. They will undertake individual self-directed research and learn how to record and present the results of this research. Students will also acquire an appreciation of the ideals and aspirations that support the architectural styles examined, and how these are related to wider social and cultural movements. On successful completion of this unit, students will be able to demonstrate: a familiarity with a range of Australian buildings and styles. Site tours will examine specific buildings, and these will be recorded in a site visit log; the ability to research, record and present a specific building in Sydney; the ability to link a specific building to other works of a similar style and period. This will be assessed in the seminar presentation and in the submitted essay. Lectures are the central teaching component of the course.

DESA3012 Counter Practices in Architecture
Dr LeeStickells

Focused on the 1960s and 1970s, this unit will explore an alternative genealogy of the postmodern turn in architecture. It will introduce students to experimental practices and polemics that emerged when architects and figures from the counterculture responded to the identification of global environmental emergency, urban instabilities; revolutions in communication technologies and expanded forms of environmental control; growing militarism and globalising forces; and burgeoning claims to self-determination and environmental justice.
Design Intensives

Every academic year, during certain intervals, the Faculty and Discipline will offer design-based intensives in Australia and abroad allowing students significant hands-on experiences in diverse locations determined in part by the coordinators’ research interests.

DESA3015 Broken Hill and Far West NSW Projects

Professor Michael Tawa
(winter interval only)

This unit of study introduces students to a community engaged learning and teaching setting, working on collaborative, multidisciplinary action research project that crosses over business and architecture. The design project will exercise and extend design skills and knowledge required to produce a plausible conceptual solution to a large-scale regional city condition that addresses educational, sociocultural, business, heritage, architectural, landscape and technological issues, with an emphasis on indigenous community needs. Architecture students will work with their Innovative and Enterprise counterparts from the Business School to develop viable architectural and business solutions that integrate multiple criteria (contextual, sustainable, urban design, structural, material, constructional, representation) into a design within rigorous conceptual and theoretical framework. The project will offer students opportunities to engage with the professionals and the broader community.

DESA3007 Prefab Architecture

Dr Mathew Aitchinson
(summer interval only)

This unit will introduce students to the benefits and limitations of prefabricated architecture through case study analysis and design exercises. Architects have long used prefabricated housing to explore industrialised building solutions, often with disappointing results. Yet, recent developments show the conditions for a more industrialised approach to housing – especially its promise of low-cost, more socially inclusive, and well-designed housing – have rarely been better. Australia’s housing affordability crisis, changing design needs, sustainability concerns, and the rise of digital and automated fabrication technologies, have conspired to challenge a housing industry deeply resistant to change. Using design research tools, students will assess case study projects before developing their own prefab building ‘offering’. Through a series of workshops running parallel to ‘live’ research projects within the Innovation in Applied Design Lab, students will have contact with professionals and researchers active in the industry.

DESA3014 Finding Country

Kevin O’Brien, Prof Michael Tawa

This unit of study involves an intensive 4-day workshop focusing on ‘finding country’: that is recuperating the erased or imperceptible layers of Aboriginal and Torres Strait Islander histories within the urban fabric of Sydney. The workshop also aims to make propositions for urban interventions within the city fabric that would re-establish the value and importance of those histories to the cultural and experiential futures of the city.
UNDERGRADUATE PLUS

International Exchange

Our students are encouraged to engage in an international exchange. If you have completed at least one full year of study and are eligible, you can study with one of our international partner institutions for one semester.

Our Study Abroad and Exchange unit of the International Office will support you in your application process, and help you to enrol in a full-time program whilst on exchange, with no further tuition costs incurred with the partner university.

Lund University  (Sweden)
University College Dublin  (Ireland)
Milan Polytechnic  (Italy)
Aarhus School of Architecture  (Denmark)
Technical University Berlin  (Germany)
University of Stuttgart  (Germany)
Ecole Nationale Superieure d'architecture de Strasbourg  (France)
University of Newcastle  (UK)
McGill University  (Canada)
University of California, Berkeley  (USA)
University of Miami  (USA)
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for more information, please visit the following websites:

http://sydney.edu.au/architecture/study/bae.shtml