DEAKIN UNIVERSITY’s
Faculty of Science, Engineering and Built Environment Research
SEBE is comprised of four schools supported by strategic research centres and institutes.

School of Architecture and Built Environment

Based at Deakin’s Waterfront Campus in Geelong, the School of Architecture and Built Environment aims to develop a robust and agile ecosystem for the sector and its related industries. Embracing industry-driven, practice-based and applied research, the School’s research and development is informed by its Integral Design Framework (IDF) - a transformative model that explores interdependencies and identifies areas to create effective impact. Inspired by our academic expertise, research falls under three key themes:

Construction Management | Construction management, economics and procurement; smart, lean and sustainable construction; digital engineering and building information modelling; building energy and performance management; integral construction - making impact through transdisciplinary research.

Architecture | Science of architecture and built environment; history and theory of architecture and built environment; ecology of architecture and built environment; design experience of architecture and built environment; integral architecture and built environment.

Planning, urban design and landscape architecture | Innovation in planning, urban design and landscape architecture; processes, strategies and infrastructure for planning and designing cities; smart and sustainable future cities and regional communities; Indigenous and rural cultural landscapes and heritage; integral planning, urban design and landscape architecture.

School of Engineering

The School of Engineering is based in the state-of-the-art, purpose-built Centre for Advanced Design and Engineering Training (CADET) facility at the Waurn Ponds Campus in Geelong. Many research projects conducted within the school are funded by industry partners ranging from regional small-to-medium enterprises to large multinational companies and government agencies.

Deakin Digital Design and Engineering Centre (3DEC) was established to lead the creation of holistic, product-focused digital design and engineering solutions for industry and the wider world. Our project teams aim to deliver creative, end-to-end research and development solutions using the latest advances in design development and analytical tools. We achieve this by:

• integrating 3D digital technologies
• creating innovative digital applications
• improving social outcomes through digital technology
• using technology to provide virtual and physical outcomes from concept to visualisation, design, communication, testing and analysis, and manufacture.

Systems and Control is focused on solving fundamental and applied research problems across a wide range of societal needs. Our research team combines expertise in:

• control systems theory
• complex interconnected systems
• robotics - land, aerial, underwater
• power systems including renewable multi-microgrids
• biomedical systems and devices
• industry 4.0.

Energy represents a wide range of research activities in electrical, power, renewable and thermal energy. Our team is focused on improving the ways that energy is generated, transmitted, used, mitigated and stored to solve key challenges faced by governments, industry and society.

Centre for Smart Power Engineering Research (CSPER) has 14 academic researchers and a team of postdoctoral researchers and PhD students that are addressing research challenges across three major clusters:

• Future power grids
• Renewable energy and energy storage
• Cyber physical energy systems.
Infrastructure and Environment provides engineering solutions for development while achieving positive environmental outcomes that benefit our world. We work with many stakeholders to design and build infrastructure and landscapes that are productive and sustainable.

Our research activities cover different aspects of structural, geotechnical, water, road and transport, and environmental engineering. Examples of multidisciplinary activities that we are engaged in include:

- efficient use of new materials in innovative engineering applications
- soil structure interactions
- assessment of environmental and socio-economic impacts of new infrastructure
- management of road networks for efficient use.

School of Information Technology

Based at Melbourne and Geelong campuses, the School of Information Technology offers courses in artificial intelligence, cyber security and software engineering. The School has several international research partnerships with Chinese universities and has jointly established a Big Data Research Centre with Southwest University. It hosts numerous Chinese PhD students and visiting scholars funded by the Chinese Scholarship Council or jointly by Deakin and their home universities. The School is home to four research centres and 14 laboratories centred around four key research areas:

Internet of Things (IoT) applied to research and development topics including:
- IoT in the loud, fog, edge computing
- IoT-enabled participatory sensing and crowdsourcing
- cellular IoT, 5G IoT communications
- IoT actuation and swarm robotics
- open marketplace (IoT data and services).

Software Engineering focused on human-computer interactions, extended reality systems, cyber-physical and intelligent systems, blockchain technologies, and information technology assisted learning.

Data Science for multidisciplinary problems in artificial intelligence (AI), machine learning, complex networks, data analytics and optimisation with expertise in:
- knowledge graph systems
- social network computing
- deep networks
- structural pattern analysis
- computational diagnostics for smart healthcare
- anomaly detection, prediction and management.

Cybersecurity, partnering with industry and publicly funded research agencies to make impactful contributions to blockchain, forensics, cyber-physical systems, privacy and trust management.

About our PhD program

A PhD program enables you to develop independent research skills and is for students who want to pursue their own theories and ideas at a high conceptual level. Skills developed as part of a PhD include the ability to formulate a significant research problem, relate research to the broader framework of knowledge in the chosen area, and master appropriate skills to solve a problem. Research results are incorporated into a thesis and this is submitted for examination. Research-level study can lead to a research or academic career and is highly valued in the workplace.

PhD Applications | All students interested in undertaking a Master by Research or PhD in any of the architecture and built environment; engineering; information technology; or life and environmental science disciplines must initially liaise with a Deakin supervisor. Once a Deakin academic agrees to supervise you, they will endorse an Expression of Interest (EOI) form that must be sent to sebe-phd@deakin.edu.au

Please note, it is preferable that English language requirements have been met at EOI stage.

For further information about the application process, including minimum academic entry requirements, English language requirements, scholarships (stipend and fee waiver), please visit: deakin.edu.au/research/become-a-researcher-student/how-to-apply-research-degrees

Scholarships are awarded on academic merit.

Inquiries: sebe-phd@deakin.edu.au

School of Life and Environmental Science

Based across Deakin’s Melbourne, Geelong and Warrnambool campuses, the School of Life and Environmental Science offers courses ranging from environmental science, marine biology and conservation biology to biomedical science and forensic science. Research falls under three themes:

Life on Land (Ecology and Environment) encompasses ecological, animal and human contributions to the environment and their responses to global issues such as wildlife conservation, evolution, agriculture and climate change. Overall research aims to understand living systems and how they relate to their environment.

Life in Water (Marine, Fisheries and Aquaculture Sciences) explores the critical role of aquatic systems as a productive natural resource that needs careful scientific management from both an environmental and production standpoint. Research covers freshwater and marine biology and intersects with fisheries and aquaculture.

Molecules of Life (Physical, Chemistry and Molecular Sciences) focuses on measuring and assessing the molecules of life to determine their influence in biomedical, forensic, chemistry and biotechnology contexts.
Faculty of Science, Engineering and Built Environment (SEBE)
Strategic Research Centres

Centre for Cyber Security Research and Innovation (CSRI)
deakin.edu.au/csri

CSRI focuses on developing innovative technologies and methods to secure cyberspace through advancing theoretical understanding and exploring strategies, policies and laws that will enhance cyber security. With more than 45 researchers and 30-plus PhDs, our holistic, multidisciplinary approach to cyber security research uniquely positions us to work with industry and government to respond to new challenges as they emerge. The CSRI team draws on backgrounds in academia, industry and government to offer a world-class combination of experience and knowledge. With an Executive Advisory Board for Cyber (EABC) comprised of more than 40 commercial organisations and government agencies, CSRI is well positioned to understand the challenges of today and the future.

Our core capabilities are listed below.

Human & Business Centric Cyber Security
Organisational security; protective security and information warfare; privacy, identity and trust management; law, regulation and strategic policy.

Cyber Security Technologies
Cyber analytics and AI; IoT/CPS and critical infrastructure security; digital forensics and incident management; law, regulation and strategic policy.

Centre for Integrative Ecology (CIE)
deakin.edu.au/cie

The CIE aims to address the effects of global change on biodiversity and human livelihoods, merging interdisciplinary expertise in ecology, conservation and sustainability to solve complex problems, enhance ecological understanding and promote public engagement. Conducting field, laboratory and computational research across terrestrial, marine and freshwater environments, we embrace novel technologies to elucidate animals’ adaptations to their environment; monitor and conserve biodiversity; explore human impacts on nature; and heighten appreciation of natural ecosystems. We work across three key research areas (listed below).

Understanding nature
Evolutionary responses to environmental change; behavioural, developmental and physiological adaptations; movement ecology in unpredictable or modified landscapes; biodiversity drivers and constraints (natural and sexual selection); native and threatened species ecology and behaviour.

Sustaining nature in a changing world
Wildlife disease; climate change impacts on biodiversity; invasive species impact; ecosystem integrity and functions (fire, urbanisation, habitat fragmentation and loss, ecological restoration).

Sharing one planet
Integrated sustainability (economics, population density, resource consumption); ecologically sustainable food production; conservation policy; blue carbon and ecosystem services; engaging society with nature.

Centre for Regional and Rural Futures (CeRRF)
deakin.edu.au/cerrf

CeRRF has the capability and capacity to address regional and rural productivity problems with teams from engineering, science, business, economics and the humanities. The Centre focuses on bridging the gaps between regional enterprises, governments and academia. With significant investment in cutting-edge facilities and fitted with state-of-the-art equipment, CeRRF is the premier centre for regional research and produces the best innovations that positively impact rural communities both in Australia and around the world.

Our research is based on best-practice frontier technologies for building and transforming regional and rural industries. Our researchers bring novel, creative solutions to wide-ranging agricultural productivity and trade-related ventures. We focus on understanding our customer needs to ensure that our research remains relevant and produces high-value outcomes. Our work ranges from designing smarter technologies for increased productivity and sustainability to developing regional competitiveness.

Our research themes are:
- Regional competitiveness
- Better products and services
- Enabling technology
- Sustainable environment
- Water use.

Published by Deakin University in July 2020. While the information published in this booklet was accurate at the time of publication, Deakin University reserves the right to alter, amend, or delete details and other information published here. For the most up-to-date information view our website at deakin.edu.au

Deakin University CRICROS Provider Code: 00113B