



THE UNIVERSITY  
OF QUEENSLAND  
AUSTRALIA

**LIBRARY**  
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## **Engineering and Technology Collection Development Policy**

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### **1. Purpose of the collection**

The Library purchases resources on engineering and technology to support research and teaching activities in the School of Engineering, School of Information Technology and Electrical Engineering, and associated centres. Some sections of this material are also relevant to teaching and research in the School of Physical Sciences, School of Molecular and Microbial Sciences, School of Geography, Planning and Architecture.

### **2. Primary user groups served**

The School of Engineering offers undergraduate courses in: Aerospace, Biomedical, Chemical, Civil, Computer Systems, Electrical and Electronic, Environmental, Materials, Mechanical, Mechatronics, Minerals Processing, and Mining.

Engineering schools offer Graduate Certificates, Postgraduate Diplomas and Masters (coursework) higher degrees in Engineering, Technology Management and Mineral Resources. Research higher degrees are offered in Engineering, Master of Engineering Science and Doctor of Philosophy.

The research of staff and graduate students of the various schools and centres covers most areas of engineering. These are listed below by discipline.

#### **Chemical Engineering:**

reaction engineering, especially of adsorption and catalytic reactions, adsorption-desorption, precipitation processes, crystallisation, process modelling and simulation, computer based flowsheeting, advanced process control, hazard analysis and risk assessment, expert systems and neural networks, man/machine interface, greenhouse gas mitigation, wastes from oil shale mining and processing, impacts of wastewater discharges on estuaries and coral reef ecosystems, constructed wetlands for wastewater and stormwater treatment, design and operation of landfills environmental analysis, bioremediation of refractory organics, ponds for industrial and municipal wastewater treatment, high rate anaerobic wastewater treatment, control of

activated sludge treatment systems, air pollution control and assessment, waste combustion systems waste minimisation, recovery and reuse, De-NO<sub>x</sub> and SO<sub>2</sub> removal, odour and VOC control, fluidisation, granulation and coating, fluid flow simulation, coal combustion, particle packing, porous materials, pneumatic conveying, crystallisation, solid-liquid separation and rheology of suspensions, rheology and coating of kaolin suspensions, elongation and extrusion coating of plastics, rheology of liquid crystal polymers, understanding molecular entanglements, development of compostible (biodegradable plastics), rheology of precursors for superconducting materials, rheology and modelling of thermosets used in computer chip manufacturing and automotive components, rheology and modelling of droplets and jet formation, biological pest management in agriculture and aquaculture, biomedical engineering, nanotechnology and nanostructured materials

### **Civil Engineering:**

interaction between wind and structures, flood loads on bridge decks, effect of waves on near-shore coastal waters including reefs, water table dynamics in coastal areas, aeration of water bodies , water flow and sediment, resistance to flow in natural channels, computational fluid dynamics/hydraulics, modelling various aspects of rainfall, geomechanics of coal mine waste disposal and rehabilitation, dynamic pile testing, effects of foundation-structure interaction on the performance of electrical transmission line towers, behaviour of lateritic soils as pavement material, performance of expansive clay road embankments, ground motion amplification and earthquake induced liquefaction in sand deposits, large displacement, elasto-plastic nonlinear behaviour of space frame structures, structural response to earthquake ground motion, behaviour of cold-formed structures, bending, buckling and vibration of thick plates, torsion, distortion and fatigue in concrete structures.

### **Electrical Engineering:**

artificial neural networks, speech processing, robotics, intelligent systems, computer architecture, VLSI, digital system design, microwave systems, radar, antennas, optoelectronics, power systems, control power electronics, high voltage engineering, medical imaging, signal processing, microwave wireless communications, image and signal processing, with projects including ground penetrating radar and medical diagnostics.

### **Mechanical Engineering:**

concurrent engineering, mechanical systems design, design for production, study of the design process, hypervelocity flows including combustion CFD applied to hypervelocity flows, scramjet propulsion, development of hypervelocity test facilities, shock based phenomena,

pulsed jets, turbulence modelling, turbulence heat transfer, turbomachinery, experimental aerodynamics and experimental fluid dynamics at low and super-orbital speeds, combustion of metals/nonmetals, combustion under normal and reduced gravity, control systems, vibration measurement and analysis, finite analysis, finite element analysis of transient phenomena, acoustic measurements, guided waves ultrasonics, acousto-ultrasonics, stress wave factor technique, point source/point receiver ultrasonic technique, phase sensitive resonance technique, ultrasonic fatigue, impact mechanics, fracture mechanics, hot/cold wire anemometry, laser Doppler anemometry, impulse drag measurement, nonlinear dynamics, stochastic mechanics, control of flexible structures, CMAC based neural network controllers, engineering education, modular mechatronic systems design, rapid prototyping, CAPP, CAM, application of stochastic processes in technology management, operations research, production planning, expert system applications, analysis of professional practice

### **Mining, Minerals and Materials:**

long-term performance of underground excavations, open cut operations, dragline simulation and operations, mine ventilation, coal and coal seam behaviour, tunnel design and support, mine seismicity and rockburst mechanics, mine evaluation economics, process mineralogy, coal processing, comminution and separation technologies, general extractive metallurgy, pyrometallurgy, hydrometallurgy and electrometallurgy, casting technology for aluminium and magnesium alloys, cast ferrous metals for wear-resistant applications, micromechanics of damage and fracture of Al-Mg-Si casting alloys, corrosion of engineering materials especially atmospheric corrosion and environmental fracture, structure properties and performance of polymers, alloy development and powder metallurgy, particularly mechanical alloying and phase sintering, structure and properties of steels and in martensitic transformations in steels and other materials

### **3. Description of existing collection**

The majority of the collection is housed in the Dorothy Hill Physical Sciences and Engineering Library, although older less-used material may have been withdrawn to library warehouses. The collection includes:

- Australian standards in full text online from SAI Global on-line premium. The 2007 Annual book of ASTM standards is held. The British standards collection is current to 1997 when the subscription was cancelled
- *ACM Digital Library* (Association for Computing Machinery), which contains articles, published in ACM periodicals and proceedings since 1985

- *Crossfire Commander* includes access to CrossFire Beilstein, CrossFire Gmelin and MDL Patent Chemistry
- *IEEE Xplore* provides full text access to technical literature in electrical engineering, computer science, and electronics, including IEEE Software Engineering Standards, since 1988
- The full text of over 2000 Elsevier Science journals is available through *Science Direct*
- *MathSciNet* (1940-)

Databases include:

- *Compendex* (1884 -)
- *GeoRef* (1693-)
- *INSPEC* (1896-)
- *NTIS* (1964-)
- *Web of Science* on the Web of Knowledge platform (1900-)
- *Chemical Abstracts* and the *CAS Registry File* are available as the *SciFinder Scholar* database (1907-)
- *Scopus* (1966 -)
- *CSA Materials research database with METADEX* (1966-)
- *ESDU Engineering series from the Engineering Sciences Data Unit*
- *IMMAGE*, from the Institution of Mining and Metallurgy (1979-)
- *Civil Engineering*, from the American Society of Civil Engineers (1970-)

The reference collection includes an extensive collection of recent handbooks, specialist and general encyclopaedias, dictionaries and indexes.

#### **4. Interdisciplinary relationships**

The engineering collection is supported by titles in physics, chemistry, **biology**, mathematics, computer science, environmental science, earth sciences and medicine.

#### **5. Scope of current collecting**

##### **1. Languages collected**

Foreign language monographs are not normally collected. Some foreign language journals are received on exchange

##### **2. Geographical areas collected**

Not relevant to engineering and technology

##### **3. Chronological periods collected**

No chronological period is excluded

##### **4. Types (formats) of material collected**

Material is collected in all forms, both physical and electronic.

## **5. Publication dates**

Collecting focuses on current imprints. Retrospective purchase of items such as back runs of journals may be made to support new research programs.

## **6. Special considerations**

None.

## **7. Conspectus**

Overall the engineering and technology collection is rated at 3AE. There are particular areas of strength rated at 3B which closely relate to research areas in the engineering schools. These include: human engineering, ergonomics, systems engineering, engineering economy, engineering mechanics, acoustical engineering, vibration, fluid mechanics and dynamics, standards, structural analysis, engineering geology, rock and soil mechanics, tunnels and tunnelling, protection of harbours and coasts, highway engineering, network theory, production of electrical energy or power, thermodynamics, dynamo electric machines, transmission of electric power, computer networks, radio telecommunication, radar, electronic apparatus and materials, microwaves, computer engineering and hardware, semi-conductor devices, mining engineering and metallurgy, fermentation science and technology, manufacture of chemicals, clay industries, ceramics, glass.