

## CIV5263: Hydraulics of Sewerage Systems

### Background and Aims

The unit aims to introduce students to the concepts involved in the hydraulic design of sewerage systems. The integrated design requires consideration of the sewage collection, transport, treatment, and disposal systems. The emphasis in this course is on hydraulic design – the bio-chemical treatment processes are not covered.

Detailed design of all hydraulic aspects of sewerage systems are covered, including reticulation systems, sewer appurtenances such as manholes and inverted siphons, flow measurement systems, pump and pump system design, and sewage treatment plants. Practical issues related to design and maintenance practices such as fail-safe operation are covered.

*After completing this unit participants will understand:*

- an overview of the sewage collection, transport, treatment, and disposal processes from a hydraulic perspective
- the hydraulic principles involved in the design of sewerage systems
- the practical aspects of sewerage system design; and ultimately
- the capability to plan, design, and analyse a sewerage system with respect to its hydraulics

*Details of the structure of the unit are provided over the page*

### Enrolment Options

Enrol as a single unit or as part of either the Graduate Certificate in Infrastructure Engineering and Management, Postgraduate Diploma in Infrastructure Engineering and Management, or Master in Infrastructure Engineering and Management.

### Off-Campus Study Mode

This unit is offered by Off-Campus (distance education) and there is no requirement for participants to attend lectures. Study guides, comprising a comprehensive set of course notes, are sent following enrolment. Further support is provided through a unit web site and via e-mail. The lecturer is available to answer questions and to provide assistance as necessary throughout the semester. Assistance can be arranged by email, facsimile, mail, telephone or through the discussion groups on the unit web site. Assessment comprises two assignments and an examination (worldwide exam venues are available).

### Unit Co-ordinator



Associate Professor Bob Keller specialises in the areas of hydraulic structures and river engineering and is actively involved in many numerical and physical model studies. He works in the CRCCH's River Restoration Program and leads projects on fishway

design and scour issues in rivers.

### Enrolment or General Course Enquiries:

Ms Brenda O'Keefe:

Tele: +61 (0)3 9905 9627

Fax: +61 (0)3 9905 4944

Email: [brenda.okeefe@eng.monash.edu.au](mailto:brenda.okeefe@eng.monash.edu.au)

Website:

[civil.eng.monash.edu.au/courseworkdegrees/infrastructure](http://civil.eng.monash.edu.au/courseworkdegrees/infrastructure)

# Structure

The unit is structured around 6 topics which are generally associated with one-two week(s) of study

Topic	<i>After completing this topic, participants will:</i>
<b>1 &amp; 2. Basic Hydraulics</b>	<ul style="list-style-type: none"><li>• develop an understanding of the more specific elements of sewerage hydraulics. These specific elements include, but are not limited to, reticulation systems, pump stations, flow measurement systems, and sewage treatment plants</li></ul>
<b>3. Reticulation Design</b>	<ul style="list-style-type: none"><li>• understand the extension of the material on flow resistance</li></ul>
<b>4. Sewer Appurtenances</b>	<ul style="list-style-type: none"><li>• understand the emphasis is on the hydraulic characteristics of some of the more common appurtenances</li></ul>
<b>5 &amp; 6. Flow Measurement</b>	<ul style="list-style-type: none"><li>• understand the major issues of flow measurement in sewerage systems</li><li>• understand the issue of data auditing</li></ul>
<b>7 &amp; 8. Hydraulics of Single and Multiple Pump Systems</b>	<ul style="list-style-type: none"><li>• broadly understand the hydraulics of pumps and pump systems</li></ul>
<b>9 &amp; 10 &amp; 11. Hydraulics of Sewage Treatment Plants</b>	<ul style="list-style-type: none"><li>• identify the hydraulic principles associated with various unit operations and processes</li><li>▪ understand how knowledge of the hydraulics leads to improved system design</li></ul>