ELEC3320 Process Instrumentation and Control

General Course Information Sheet

Outcomes

Students are able to understand principles involved in the measurement and control of industrial processes; become familiar with ISA standards, instruments and devices available for designing process control systems; understand and prepare technical design documentation; and gain understanding of PLCs and ladder programming, and implementation of control theory in industrial systems.

Course Contents

Topics include transducers (temperature, pressure, flow, density, liquid level, viscosity etc), advanced sensor device technology, typical control system actuators (pneumatic valves, electric valves, hydraulic valves, solenoids), converters, transmitters, ISA standards, process and instrumentation diagrams, examples of control loops, supervisory control, direct digital control, feedback and feedforward control, formulating process models, general conservation principle, conservation of mass, momentum and energy, dynamic behavior of low order an higher order systems, time delay systems, Laplace and Z-Transforms, frequency response analysis, PLCs ladder logic programming, implementation of controllers in PLCs, SCADA systems, process control system synthesis case studies (e.g. boiler controls in power systems, steam turbine controls, water treatment control). Guest lecturers from industry speak on various aspects of process instrumentation and control.

Pre-requisites

Prerequisites: MATH2040 Engineering Mathematics and MATH2235 Mathematics E2C or equivalent
Advisable prior study: CITSI210 C Programming or equivalent; block diagrams, signal flow graphs and stability from ELEC2305 Signals and Systems 2 or equivalent Contact hours—57 (lectures: 33 hrs; tutorials: 12 hrs; labs: 12 hrs)

Lecturers and Tutors:

- Dr. Tyrone Fernando

  Contact Details: Room No: 4.13, Phone: 6488 3954, e-mail: tyrone@ee.uwa.edu.au

Lab Demonstrator

- TBA
Reference Books


Lecture Notes, Tutorial Sheets, Solutions and Laboratory Manuals

- Material covered in the notes will be taken mainly from the references.
- Copies of Lecture Notes will be handed out during the lecture hours.
- Tutorial Sheets will be handed out during the tutorial.
- Laboratory Manuals will be handed out during the lab sessions.

Consultation Times

Any day between 9 am and 4 pm except during lecture and tutorial hours

Assessment

Examination: 70 %

Test: 10 %

Laboratory: 20 %

Timetable for Test

Test is on Monday, 27th April 2009, 12:00 noon to 12:45 pm in 1.07 - Woolnough Lecture Theatre, Material for Test-I: To be announced.

Deadlines for Lab Reports

Lab reports are due one week from the date of lab session by 16:00 hours, a penalty of 1 mark per day will be deducted for late submissions.
**Lecture Hours**

Mondays: 12:00 to 12:45, in 1.07 - Woolnough Lecture Theatre

Tuesdays: 11:00 to 11:45 in ENCM: ELT1

Thursday: 10:00 to 10:45 in 1.07 - Woolnough Lecture Theatre

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**Tutorial Hours**

Friday: 8:00 to 8:45 in ENCM: ELT1

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**Laboratory Hours**

Monday: 14:00 to 17:00, in ELEC G52C

Tuesday: 14:00 to 17:00, in ELEC G52C

Wednesday: 15:00 to 18:00, in ELEC G52C

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**Faculty Policies**


