

Mathematics Examination Feedback Form

This form is intended to provide generic feedback to students on examination performance in individual units, in line with university code of practice for the assessment of taught programmes. Its purpose is to help students to develop their skills, knowledge and understanding and help them evaluate their current level of performance.

Unit Title:	Ordinary Differential Equations 2
Unit Code:	MATH 20101J
Examination Markers:	Stephen Wiggins

Common areas that were well done:

Q1a and d were generally well done by most students.

Q2. Most students understood the concept of a flow, and linearization.

Q3. Most students understood how to find the invariant manifold structure associated with the linearization of a vector field about a fixed point.

Q4. Overall, students understood most of this problem.

Q4a was well done by most students

Common errors, misunderstandings or other areas requiring improvement:

Q1 b. Some students assumed that the violation of Bendison's criterion implied the existence of periodic orbits.

Q1 c. Some students were not clear on the distinction between Lyapunov stability and asymptotic stability in the use of Lyapunov's method.

Q2. Some students did not adequately explain why certain curves were invariant. In a) some students did not recall how to solve linear, inhomogeneous first order ODEs (which they learned in the first year).

Q3d. Some students did not thoroughly understand all steps in the application of the LaSalle Invariance Principle.

Q4b. There was confusion by some students in recognizing the Hopf bifurcation.

Q4d. Some students were not able to recognize that this system had 3 saddle-node bifurcations.

General comments on the paper:

Students that followed the course throughout the year did well on this exam.