

**Math 2131 Vector Calculus Winter 2015**  
**Course Outline**

Instructor: Dr. Elcim Elgun

Office: RB 2018

Phone: (807)-346-8688

Office Hours: Mondays and Wednesdays 1.00-2.00 pm & 4.00-5.00 pm or by appointment

Email: eelgun@lakeheadu.ca

Lectures:

Math 2131 WA: MWF 2.30 am - 3.30 pm in RB 3044

Course Description:

Coordinate Systems and vectors, parametric curves and surfaces, partial differentiation, multiple integration, vector fields, and vector calculus including Green's Theorem, Stokes' Theorem and the Divergence Theorem. Prerequisite: Math 1172 or permission of the Chair of the Department of Mathematical Sciences.

Required Textbook:

*Calculus: one and several variables* by Salas, Hille and Etgen, 10th edition. (We will cover Chapters 13-18.)

Grade Distribution:

Your final grade will be computed as follows:

Assignments: 15 %, Midterm Exam 1: 20 %, Midterm Exam 2: 20 %, Final Exam: 45 %.

### Syllabus:

- Vectors in 3-dimensional space, dot and cross products, lines curves and planes in 3-dimensional space ( will be covered in Weeks 1 and 2 of the term, contains the material from Chapter 13 of the Textbook).
- Differential vector calculus: Limit, continuity, differentiation, motion ( will be covered in Weeks 3 and 4 of the term, contains the material from Chapter 14 of the Textbook).
- Functions of several variables, partial derivatives ( will be covered in Weeks 5 and 6 of the term, contains the material from Chapter 15 of the Textbook).
- Differentiability, gradients, directional derivatives, Mean Value Theorem, Chain Rule, Differentials. ( will be covered in Weeks 6 and 7 of the term, contains the material from Chapter 16 of the Textbook).
- Multiple integration: double integrals, polar coordinates, triple integrals, spherical coordinates, changing variables in multiple integration. ( will be covered in Weeks 8, 9 and 10 of the term, contains the material from Chapter 17 of the Textbook).
- Vector fields, line integrals, arc length, Green's Theorem, surface integrals, Divergence Theorem, Stoke's Theorem. ( will be covered in Weeks 10, 11 and 12 of the term, contains the material from Chapter 18 of the Textbook).

### Assignments:

A set of homework problems will be assigned every week on the course website (see MyCourseLink). The assignments are due Friday mornings 10.00 am. Assignments should be dropped in the Math 1172 Assignment Box on the second floor of Ryan Building before the due time. Late assignments will not be marked under any circumstances.

### Midterm Exams:

The first midterm exam will be written on **February 4, 2015, at 2.30 pm** ( Week 6 of Lectures ) and the second midterm exam will be written on **March 11, 2015 at 2.30 pm** (Week 9 of Lectures). The place will be announced on the course website. The exam will be closed book with no calculators or other aids allowed. No make-up test is provided for any student who misses writing the midterm exam at the scheduled time. If there is a legitimate (documented) reason, the final grade will be calculated on the basis of the final exam. Otherwise, a grade of 0% for the missed exam will be given. The material the midterm exam will cover will be announced in class and on the course website.

### Final Exam:

Date: To be announced. The final exam period is April 10-23, 2015. You will need a minimum of 6 graded assignments in order to take the final exam.

Academic Dishonesty : All cases of academic dishonesty will be dealt with according to the University's Code of Student Behavior and Disciplinary Procedures, copies of which are available from the Registrar.