

Application of RTK-GPS in Precision Agriculture

Time: October – November 2010

Instructors - Dr. Qamar Zaman

Background: The Global Positioning System (GPS) provides opportunities for agricultural producers to manage their land and crop production more precisely. Common names for general GPS applications in farming and ranching include precision agriculture, site-specific farming and prescription farming. GPS applications in farming include guidance of equipment such as sprayers, fertilizer applicators and tillage implements to reduce excess overlap and skips. The module will introduce the applications of RTK-GPS and GIS application to develop management zones for site-specific management of agricultural inputs to increase farm profitability and reduce environmental risks. The RTK-GPS gathers data very accurately within 1cm accuracy. The location information along with some attribute information would be used to ameliorate productive and unproductive areas within field. This graduate module will be available to any graduate students and will be offered for the first time in the fall semester of 2010.

Content: The proposed module will consist of the following components:

1. Participation in and completion of the following segment in ENGN 2011 Technology for Precision Technology

Lectures:

| <u>Days</u> | <u>Topic</u> |
|-------------|---|
| 1 | Use of GPS in Agriculture |
| 2 | Different type of GPS and their accuracy |
| 3 | RTK GPS Demonstration and Practical use |
| 4 | Global Positioning Systems and Functionality |
| 5 | Combining GPS and GIS information to develop management zones |

Labs:

| | |
|---|---|
| 1 | Using Handheld GPS Units |
| 2 | Setting up base station and wireless communication with Receiver Mapping points, lines and areas using RTK GPS |
| 3 | Measuring Elevation using RTK GPS |
| 4 | Determination of accuracy using different positioning devices |
| 5 | Use of DGPS on Farm Vehicle |

2. Individual research project in an area of precision agriculture of the graduate student's special interest to be reported to the module supervisor in written form.
3. A short oral presentation of the individual research report, to the undergraduate class.

Marking Scheme:

1. Exam at the end of module from Component 1 - 60%.
2. Research project - 30%.
3. Oral presentation - 10%.

Instructor - Dr. Qamar Zaman

Associate Professor-Precision Agriculture Research Chair
Engineering Department, NSAC

qzaman@nsac.ca

