Course Instructor: Dr. DongMei Chen  
Email: chendm@queensu.ca

Office: Macintosh-Corry Hall D125

Contact Time: Two-hour lecture and two-hour lab per week  
Phone: 613-533-6045

Format: Lectures, labs, discussions, presentations and a final project

Class Assessment

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Lab assignments</td>
<td>40%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>25%</td>
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<tr>
<td>Final Project Report and Presentation</td>
<td>20%</td>
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<tr>
<td>Seminar and project proposal presentations</td>
<td>10%</td>
</tr>
<tr>
<td>Class participation and discussion</td>
<td>5%</td>
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</tbody>
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COURSE OVERVIEW

This course covers a set of spatial and process-based modeling techniques and their applications in solving physical and environmental problems. It combines lectures with a substantial practical component. The lectures cover technical issues related to physical and environmental application, including data representation and data models, spatial interpolation, raster-based analysis and modeling in GIS, surface models and terrain analysis, data visualization, dynamic analysis, and process-based models. The practical component, involving lab assignments and a class project, will give students hands-on experience in using ArcGIS and STELLA software packages, to handle geo-spatial information. For the class project, students will be required to apply techniques and methods in more depth to environmental physical/environmental/biological applications.

LEARNING OUTCOMES

Those who successfully complete the course are able to

- understand a set of GIS and process-based techniques for geo-spatial environmental data analysis and visualization;
- gain hands-on experience in the application of ArcGIS and STELLA software in support of environmental analysis and modeling.

COURSE TOPICS

Environmental data, data representation, data modeling, data sampling, spatial interpolation, surface analysis, hydrological modeling, suitability modeling, process-based modeling

COURSE READINGS