MATH 412  **Graph Theory**  credit: 3 OR 4 hours.

(MATH 312) Examines basic concepts and applications of graph theory, where graph refers to a set of vertices and edges that join some pairs of vertices; topics include subgraphs, connectivity, trees, cycles, vertex and edge coloring, planar graphs and their colorings. Draws applications from computer science, operations research, chemistry, the social sciences, and other branches of mathematics, but emphasis is placed on theoretical aspects of graphs. 3 undergraduate hours. 3 or 4 graduate hours. 4 hours of credit requires approval of the instructor and completion of additional work of substance. Prerequisite: MATH 347 or MATH 348 or equivalent experience or CS 273.

This course satisfies the General Education Criteria for a:
Quantitative Reasoning II

<table>
<thead>
<tr>
<th>CRN</th>
<th>Type</th>
<th>Section</th>
<th>Time</th>
<th>Days</th>
<th>Location</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>39211</td>
<td>Lecture-Discussion</td>
<td>G13</td>
<td>03:00 PM - 03:50 PM</td>
<td>MWF</td>
<td>345 - Altgeld Hall</td>
<td>Balog, J</td>
</tr>
<tr>
<td>39212</td>
<td>Lecture-Discussion</td>
<td>G14</td>
<td>03:00 PM - 03:50 PM</td>
<td>MWF</td>
<td>345 - Altgeld Hall</td>
<td>Balog, J</td>
</tr>
<tr>
<td>30348</td>
<td>Lecture-Discussion</td>
<td>X13</td>
<td>12:00 PM - 12:50 PM</td>
<td>MWF</td>
<td>443 - Altgeld Hall</td>
<td>Kostochka, A</td>
</tr>
<tr>
<td>39116</td>
<td>Lecture-Discussion</td>
<td>X14</td>
<td>12:00 PM - 12:50 PM</td>
<td>MWF</td>
<td>443 - Altgeld Hall</td>
<td>Kostochka, A</td>
</tr>
</tbody>
</table>

Credit Hours: 3 hours
Quant Reasoning II course.

Credit Hours: 4 hours
Quant Reasoning II course.
Instructor Approval Required
Restricted to Graduate - Urbana-Champaign.

Credit Hours: 3 hours
Quant Reasoning II course.

Credit Hours: 4 hours
Quant Reasoning II course.
Instructor Approval Required
Restricted to Graduate - Urbana-Champaign.