Mathematics

MATH 481  Vector and Tensor Analysis  credit: 3 OR 4 hours.
Introductory course in modern differential geometry focusing on examples, broadly aimed at students in mathematics, the sciences, and engineering. Emphasis on rigorously presented concepts, tools and ideas rather than on proofs. The topics covered include differentiable manifolds, tangent spaces and orientability; vector and tensor fields; differential forms; integration on manifolds and Generalized Stokes Theorem; Riemannian metrics, Riemannian connections and geodesics. Applications to configuration and phase spaces, Maxwell equations and relativity theory will be discussed. 3 or 4 undergraduate hours. 3 or 4 graduate hours. 4 hours of credit requires approval of the instructor and department with completion of additional work of substance. Prerequisite: MATH 241 and one of MATH 415 or MATH 416 or equivalent.

<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>39531</td>
<td>Online</td>
<td>XGR</td>
<td>ARRANGED</td>
<td>-</td>
<td>-</td>
<td>McCarthy, R</td>
</tr>
</tbody>
</table>

Credit Hours: 3 hours
Restricted to MS: Civil Engr - Online - UIUC, MCS:Computer Sci Online -UIUC, MS:Mechanical Engineering -UIUC, MS: Aerospace Engr-Online-UIUC, NDEG:Grad Nondegree-CE-UIUC, or MENG:Mech Engineering Onl-UIUC.
This course is available to undergrads as an online Academic Year term offering. See https://netmath.illinois.edu/college/math-448.
Restricted to online MSAE, MSCE, MCS, MSIE, and MSME degree students. For more details on this course section, please see http://engineering.illinois.edu/online/courses/.