# The syllabus of Calculus

<table>
<tr><td colspan="6">课程基本信息（Course Information）</td></tr>
<tr><td>课程代码<br>（Course Code）</td><td>MA081</td><td>学时<br>（Credit Hours）</td><td>160</td><td>学分<br>（Credits）</td><td>10</td></tr>
<tr><td rowspan="2">课程名称<br>（Course Name）</td><td colspan="5">（中文）高等数学</td></tr>
<tr><td colspan="5">（英文）Calculus</td></tr>
<tr><td>课程属性<br>(Course Type)</td><td colspan="5">公共必修课</td></tr>
<tr><td>开课院系<br>（School）</td><td colspan="2">（英文）Department of mathematics</td><td>开课学期<br>（Term）</td><td colspan="2">（英文）Two Terms</td></tr>
<tr><td>先修课程<br>（Prerequisite course）</td><td colspan="5">（英文）</td></tr>
<tr><td>授课教师<br>（Instructors）</td><td colspan="5">Weimin Li</td></tr>
<tr><td>课程简介（Description）<br>300-500 字</td><td colspan="5">Calculus is one of the greatest achievements of the human intellect. Calculus is the foundation of modern mathematics and almost all other branches of modern science.<br>Inspired by problems in astronomy, Newton and Leibniz developed the ideas of calculus three hundred years ago. Since then, each century has demonstrated the power of calculus to illuminate questions in mathematics, engineering, and the social and biological sciences.<br>In the course of calculus, much attention is paid to concepts and solving problems, and the underlying theory and proofs of important results are also emphasized.<br>Calculus can be mainly catalogued as differential theory and integral theory, or from other point of view, single variable calculus and multi-variable calculus. Calculus is one of the most important courses for the university students who major in science and engineering.<br><br>（英文）</td></tr>
<tr><td colspan="6">课程教学大纲（course syllabus）</td></tr>
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<tr><td>*学习目标(Learning Outcomes)</td><td>By completing the course, students should:<br>(1) grasp a systematic, modern approach to differential theory and integral theory of calculus.<br>(2) be able to familiarize themselves with concepts, skills and techniques of differential and integral;<br>(3) have a clear understanding of the ideas of calculus as a solid foundation for subsequent courses in mathematics and other disciplines.</td></tr>
<tr><td>*教学内容、进度安排及要求<br>(Class Schedule<br>& Requirements)</td><td>
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<tr><th>教学内容<br>topics</th><th>学时<br>Credit hours</th><th>教学方式<br>Teaching methodology</th><th>作业及要求<br>tasks</th><th>基本要求<br>Intended learning outcomes</th><th>考查方式<br>Assessment methods</th></tr>
<tr><td>Functions</td><td>10</td><td>Class teaching</td><td></td><td>Understanding & mastering</td><td>HW &Test</td></tr>
<tr><td>Limit, continuity</td><td>16</td><td>Class teaching</td><td></td><td>Understanding & mastering</td><td>HW &Test</td></tr>
<tr><td>Differentials</td><td>14</td><td>Class teaching</td><td></td><td>Understanding & mastering</td><td>HW &Test</td></tr>
<tr><td>Mean-value Ths</td><td>15</td><td>Class teaching</td><td></td><td>Understanding & mastering</td><td>HW &Test</td></tr>
<tr><td>Integrals</td><td>17</td><td>Class teaching</td><td></td><td>Understanding & mastering</td><td>HW &Test</td></tr>
<tr><td>Differential equations</td><td>13</td><td>Class teaching</td><td></td><td>Understanding & mastering</td><td>HW &Test</td></tr>
<tr><td>Vector algebra</td><td>12</td><td>Class teaching</td><td></td><td>Understanding & mastering</td><td>HW &Test</td></tr>
<tr><td>Multi-differential</td><td>16</td><td>Class teaching</td><td></td><td>Understanding & mastering</td><td>HW &Test</td></tr>
<tr><td>Multi-integrals</td><td>16</td><td>Class teaching</td><td></td><td>Understanding & mastering</td><td>HW &Test</td></tr>
<tr><td>Curve-surface Integral</td><td>16</td><td>Class teaching</td><td></td><td>Understanding & mastering</td><td>HW &Test</td></tr>
<tr><td>Series</td><td>15</td><td>Class teaching</td><td></td><td>Understanding & mastering</td><td>HW &Test</td></tr>
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（英文）</td></tr>
<tr><td>考核方式<br>(Assessment methods and Grading)</td><td>• period aligned test grading<br>• examination on paper (closed book)<br>• Exercises: period aligned evaluation<br><br>（英文）</td></tr>
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| 教材或参考资料<br>(Textbooks & Other Reading Materials) | **Textbook：** <<Calculus>> (Seventh Edition), James Stewart, Brooks/Cole Publishing Company, 2004.<br>ISBN 0 534-39321-7<br>**References:** (1) <<Calculus and its application>> (Ninth Edition) L.J.Goldstein, D.C.Lay, D.I.Schneider. Prentice Hall, 2001.<br>(2)<<Advanced Calculus>> (Third Edition) R.C. Buck,McGraw-Hill Book Company<br>（英文） |
| 备注<br>（Notes） | HW stands for homework（英文） |