研究生课程教学大纲（Syllabus）

课程代码 Course Code	PHY8102	*学时 Teaching Hours	48	*学分 Credits	3
*课程名称 Course Name	Introduction to Soft Matter Physics				
*授课语言 Instruction Language	English				
*开课院系 School	Physics and Astronomy				
先修课程 Prerequisite					

授课教师 Instructors	姓名 Name	职称 Title	单位 Department	联系方式 E-mail
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*课程简介（中文）Course Description	软物质物理学概论是由多位专家教授的多主题课程。 主题包括： •液晶 •聚合物 •结构化膜 •活性物质 •粒状材料 •生物系统 •稀有事件 •非平衡统计物理 •计算神经科学			
*课程简介（English）Course Description	**Introduction to Soft Matter Physics is a multi-topic course taught by a variety of specialists. Topics include:** • Liquid Crystals • Polymers • Structured Membranes • Active matter • Granular material • Biological systems • Rare events • Nonequilibrium statistical physics • Computational Neuroscience			

<table>
<tr><td></td><td colspan="5"></td></tr>
<tr><td rowspan="15">*教学安排
Schedules</td><td>周次
Week</td><td>教学内容
Content</td><td>授课学时
Hours</td><td>教学方式
Format</td><td>授课教师
Instructor</td></tr>
<tr><td>1</td><td>Introduction + Polymer 1 - Tutorial: Polydispersity</td><td>3</td><td>研讨</td><td>Jakob</td></tr>
<tr><td>2</td><td>Polymers 2 - Tutorial: Polymerization polynomials</td><td>3</td><td>研讨</td><td>Jakob</td></tr>
<tr><td>3</td><td>Computational neuroscience</td><td>3</td><td>研讨</td><td>Dongzhuo Zhou</td></tr>
<tr><td>4</td><td>Monte Carlo simulation and Rare event dynamics</td><td>3</td><td>研讨</td><td>Dan Hu</td></tr>
<tr><td>5</td><td>Polymers 3 - Tutorial: FJC , entropic spring</td><td>3</td><td>研讨</td><td>Jakob</td></tr>
<tr><td>6</td><td>Neutron scattering in biology</td><td>3</td><td>研讨</td><td>Liang Hong</td></tr>
<tr><td>7</td><td>Membranes 1</td><td>3</td><td>研讨</td><td>Jakob</td></tr>
<tr><td>8</td><td>Liquid crystal</td><td>3</td><td>研讨</td><td>Zhenwei Yao</td></tr>
<tr><td>9</td><td>May day holiday</td><td></td><td></td><td></td></tr>
<tr><td>10</td><td>Polymers 3 – Advanced topics</td><td>3</td><td>研讨</td><td>Heng Xu</td></tr>
<tr><td>11</td><td>Granular Materials</td><td>3</td><td>研讨</td><td>Zhang Jie</td></tr>
<tr><td>12</td><td>Active Matter</td><td>3</td><td>研讨</td><td>Hepeng Zhang</td></tr>
<tr><td></td><td>13</td><td>Membranes 2</td><td>3</td><td>研讨</td><td>Jakob</td></tr>
<tr><td></td><td>14</td><td>Non-equilibrium statistical physics</td><td>3</td><td>研讨</td><td>Xiangjun Xing</td></tr>
<tr><td></td><td>15</td><td>t.b.d.</td><td>3</td><td>研讨</td><td>Jakob</td></tr>
<tr><td>*考核方式
Grading Policy</td><td colspan="5">Homeworks, final exam</td></tr>
<tr><td>*教材或参考资料
Textbooks & References</td><td colspan="5">General Soft Matter Physics:
• Soft Matter Physics: An Introduction, by M. Kleman and O. Laverntovich
• Soft Matter Physics, by M. Doi</td></tr>
</table>

	• Principles of Condensed Matter Physics, by P. Chaikin and T. Lubensky **Liquid Crystals:** • Introduction to Liquid Crystals Chemistry and Physics, by P.J. Collings and M. Hird • Liquid Crystals (2nd ed.), by S. Chandrasekhar • The Physics of Liquid Crystals, by P.G. de Gennes and J. Prost **Polymers:** • The physics of polymers, by Gert Strobl • Polymer Physics, by Rubinstein and Colby • Introduction to Polymer Physics, by M. Doi • Scaling concept in polymer physics, by P.G. de Gennes **Membranes:** • Statistical Mechanics and Membranes and Surfaces (2nd ed.), edited by D. Nelson and S. Weinberg • Statistical Thermodynamics of Surface, Interfaces, and Membrane, by S. Safran • Lipid – As a Matter of Fat, by O. G. Mouritsen, and O. Mouritsen **Computational Neuroscience:** • Spiking Neuron Models: single neurons, populations, plasticity, by Wulfram Gerstner and Werner Kistler • Theoretical Neuroscience, by Peter Dayan and Larry F. Abbott • Biophysics of Computation: Information Processing in Single Neurons, by Christof Koch
备注 Notes	

备注说明：

1．带*内容为必填项；

2．课程简介字数为 300-500 字；教学内容、进度安排等以表述清楚教学安排为宜，字数不限。