

授業科目名	アルゴリズムと情報学入門						
英語名	Introduction to Algorithms and Informatics						
担当教員名	David Avis						
配当学年		単位数	2	開講期	前期	曜時限	水2
授業種別・ 授業形態	専攻基礎科目 講義			授業言語	英語		
<b>【授業の概要・目的】</b>							
英語版参照							
<b>【授業計画と内容】</b>							
英語版参照							
<b>【履修要件】</b>							
英語版参照							
<b>【成績評価の方法・基準】</b>							
英語版参照							
<b>【教科書】</b>							
英語版参照							
<b>【参考書等】</b>							
英語版参照							
<b>【その他（授業外学習の指示・オフィスアワー等）】</b>							
英語版参照							

Course Title	Introduction to algorithms and informatics						
Instructor(s)	David Avis						
Assigned Grade		Units	2	Semester	Spring	Time	Wed. 2
Course Category & Course Type	Basic subject Lecture		Language		English		
Course Description (overview, purpose)							
<p>This is an introductory course on algorithms and informatics for students with no prior knowledge of the subject matter.</p> <p>The course content will include a look at the early history of algorithms, how computers store data (image, sound, and video), privacy and security issues, web design and algorithms, algorithms for optimization, data mining, and machine learning.</p> <p>Along the way, we will consider a broad variety of algorithms which have had a major impact on computing, including many of the celebrated "Top 10 Algorithms of the 20th Century," chosen by the editors of <i>Computers in Science and Engineering</i>.</p>							
Course Schedule							
<ol style="list-style-type: none"> <li>1. The early history of algorithms and informatics</li> <li>2. Graphs and networks as models: stable matchings</li> <li>3. Shortest paths</li> <li>4. The PageRank algorithm</li> <li>5. Programming and compilers</li> <li>6. Cryptography and data security</li> <li>7. Algorithms for privacy and authentication</li> <li>8. Modeling and optimization</li> <li>9. The Monte Carlo method</li> <li>10. The internet and basic routing algorithms</li> <li>11. Where is data stored and who controls it?</li> <li>12. Is there any such thing as privacy?</li> <li>13. How do computers deal with images?</li> <li>14. Can computers learn?</li> <li>15. Can computers think?</li> </ol>							
Prerequisites and Course Requirements							

<p>This is a non-technical course intended for a wide audience. Availability of a PC and basic skills in using software is assumed.</p>
<b>Grading Methods and Evaluation Criteria</b>
<p>Assessment will be based on:</p> <ol style="list-style-type: none"><li>1. Participation and mini-reports (40%)</li><li>2. Final report (60%)</li></ol> <p>Students will use online software to solve problems using algorithms studied in class. In the final report, each student will research and describe an important algorithm that is used in their own area of interest.</p>
<b>Textbooks</b>
N/A
<b>References</b>
N/A
<b>Miscellaneous (homework assignment, office hours etc.)</b>
Course materials can be downloaded from the course web page that will be announced during the first lecture.