

Course Manager

Requisite  
Computer Science English Program

## Common Subjects (Mandatory)

Course Number	Course Name	授業方法	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
01CH001	Seminar in Computer Science	2	2.0	1	Annual	by request	3B302, 3B303, 3B402, 3B405	Faculty of the Dept. of CS	Students learn an overview of various research fields in computer science, and give presentation on their research topics.	Mandatory. Details will be posted on the Department website.
01CH002	Research in Computer Science I	3	4.0	1	Annual	by request	3B302, 3B303, 3B402, 3B405	Faculty of the Dept. of CS	Under supervision of academic advisers, students acquire basic knowledge and study specific topics in computer science. They also participate in discussions held in laboratory seminars.	Mandatory
01CH003	Research in Computer Science II	3	6.0	2	Annual	by request	3B302, 3B303, 3B402, 3B405	Faculty of the Dept. of CS	Under supervision of their academic advisers, students choose research topics in computer science, and study on their own topics. They also participate in the discussions held in laboratory seminars.	Mandatory. Only for students who have got the credit of "Research in Computer Science I" (01CH002).

## Elective Subjects

Course Number	Course Name	授業方法	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
01CH103	Advanced Course in Computational Algorithms	4	2.0	1, 2					Lectures are held on the various types of modeling and algorithms that occur in scientific computing, with a particular focus on large-scale linear calculations.	Open in an odd number year. Identical to 02RA215 and 02RE707. Lectures are conducted in English.
01CH105	Special Lecture on Numerical Simulation	1	2.0	1, 2	SprAB	Thu5, 6	3B406	Dongsheng Cai	Solutions are performed for simulation problems that occur in engineering, chemistry, medicine, and economics. Specific content includes finite-difference, relaxation, and entropy-maximization methods, fractals, physical phenomena modeling with artificial life, and chaos theory and applications.	Lectures are conducted in English.
01CH107	Basic Computational Biology	1	2.0	1	FallAB	Thu1, 2	3B301	Tetsuya Sakurai, Yuji Inagaki, Mitsuo Shoji, Shoji Makino, Mitsuhiro Sato, Keiichi Morikuni	In this lecture, the students will learn 1) basic methods to solve a wide variety of problems by using a program in the field of biology and 2) molecular phylogenetic analysis molecular dynamics method, modelization and algorithm of a phenomenon, high-performance computation (HPC), and component analysis.	2012-2014年度に02RA210の単位を修得したものは履修不可。 Identical to 02RA210 and 02RE711. Lectures are conducted in English.
01CH215	Principles of Software Engineering	1	2.0	1, 2	SprAB	Wed3, 4	3A410	Simona Mirela Vasilache, Shin Takahashi	The goal of this course is to introduce basic software engineering principles. The students will learn about the necessity of software engineering as a modern engineering discipline: they will study various software development models, and focus on some of the major phases in the software development life cycle. Project planning and management, business aspects of software engineering, along with some of the basic tools used by software engineers during the development of large applications, will also be introduced.	Lectures are conducted in English.
01CH301	Programming Environment	1	2.0	1, 2	FallAB	Thu5, 6	3B301	Osamu Tatebe, Mitsuhiro Sato	Discussion of cutting-edge programming language processing systems and environments for software development enabling achievement of parallel programming, object-oriented programming, and other advanced information processing systems.	Identical to 02RE717. Lectures are conducted in English.

Course Number	Course Name	授業方法	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
01CH304	Data Engineering I	1	2.0	1, 2	Fall/AB	Mon3, 4	3Z0110	Hiroyuki Kitagawa, Toshiyuki Amagasa, Hiroaki Shiokawa	Discussion of cutting-edge data engineering technology for large-scale data centering on data mining. Begins with a survey of data-base technology and information search technology, which comprise the foundation, and then proceeds to topics on the main techniques of data mining.	Identical to 02RE703. Lectures are conducted in English.
01CH406	Advanced Course in High Performance Computing	1	2.0	1, 2	Fall/AB	Wed2, 3	3Z0110	Taisuke Boku, Daisuke Takahashi	In this course, we lecture the overall technology and scientific value of high performance computing such as very large scale numerical computation on the level of hardware, system software, algorithm and applications. Especially, parallel processing technology and related issues to support today's high-end computing are discussed.	2012-2014年度に02RA220の単位を修得したものは履修不可。 Identical to 02RA220. Lectures are conducted in English.
01CH609	Adaptive Media Processing	1	1.0	1, 2	Spr/AB	Mon2	3B303	Keisuke Kameyama	Adaptive techniques in processing, recognition and retrieval of media information will be discussed. (Lecture in English).	Identical to 01CF114. Lectures are conducted in English.
01CH740	Experiment Design in Computer Sciences	1	2.0	1, 2	Spr/AB	Fri5, 6	3B301	Tetsuya Sakurai, Aranha, Claus	In this course we will study how to design and perform scientific experiments in the context of Computer Science research, with the goal of producing sound Scientific results. Topics include techniques for parameter and experiment selection, and statistical methods for analysis of results.	Students who took the credits of the course "Topics in Computational Science II" (01CH752) in 2013 or before cannot take this course. Lectures are conducted in English.
01CH751	Topics in Computational Science I	1	1.0	1, 2	Spr/C	Intensive		Aranha, Claus	Lectures will be given on recent major problems and challenges in the field of computational science.	Students who took the course "Topics in Computational Science I" (01CH751) cannot take this course. Lectures are conducted in English.

Common Courses of Graduate School in Computational Science

Course Number	Course Name	授業方法	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
01ZZ605	Computational Science Literacy	0	1.0	1 - 5	Spr/Vac	Intensive		Hiroyuki Kusaka, Naruhito Ishizuka, Xiao-Min Tong, Tetsuo Hashimoto, Toshiyuki Amagasa, Kohji Yoshikawa, Daisuke Takahashi	In concert with experiment and theory, computational science embodying numerical analysis and high performance computing is opening new pathways into unexplored regions of science. Its role in cutting-edge research is essential and growing. Exploring the emerging world of science requires mastery of fundamentals and methodology of computational science ? in other words, computational science literacy. This lecture series is an introduction to computational science literacy for accomplishment of new advances in science. Instructors from the Center for Computational Science provide an overview of research utilizing computational science in many fields, directed toward development of a comprehensive transdisciplinary perception of scientific fields, from the perspective of computational science. The lectures include an outline of the latest computer technologies that support the advancement of computational science.	01ZZ604と同一科目である。 Lectures are conducted in English.

Course Number	Course Name	授業方法	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
01ZZ607	High Performance Parallel Computing Technology for Computational Sciences	0	1.0	1 - 5	Fall/C	Intensive		Taisuke Boku, Daisuke Takahashi, Osamu Tatebe, Hiroto Tadano, Aranha, Claus, Jinpil Lee	<p>計算科学を支える大規模シミュレーション、超高速数値処理のためのスーパーコンピュータの主力プラットフォームは最新のマイクロプロセッサを用いた並列計算機となっている。ところが、大規模な並列計算機は、高い理論ピーク性能を示す一方で、実際のアプリケーションを高速に実行することは容易なことではない。この講義は、計算機の専門でない、高速な計算を必要とする計算科学のユーザが並列計算機の高い性能を十二分に活用するために必要な知識、プログラミングを学ぶことを目的とする。これは、公開セミナーと同時に行われ、計算科学リテラシーの上級コースである。</p> <p>The main platform of supercomputers that support computational science in large-scale simulations and high-speed numerical processing now consists of arrays parallel computers utilizing the latest microprocessors. Although the theoretical peak performance of massively parallel computers is high, it is not easy to obtain those calculation speeds in actual applications. This lecture series is directed not toward specialization in computers, but rather toward enabling those who apply computational science requiring high-speed computation to gain the necessary mastery in knowledge and programming for full utilization of the high-performance capabilities of parallel computers. It is conducted concurrently with the Open Seminar, as an advanced course in computer science literacy.</p>	Lectures are conducted in English.