Course	Computational Neuromotor Control
Course No.	02RB232
Credits	2.0Credits
Grade	1, 2Year
Timetable	SprC Tue/Thu5,6
Instructor	Jun Izawa
Course Overview	The human brain is capable to generate quick and smooth motor movements within surprisingly short latencies. Once the movement trajectory is perturbed by a mechanical and/or a visual disturbance, the brain immediately changes the motor commands to correct the disturbed the trajectory. How does the brain generate such a smooth and quick skillful motor movement? What is the computation that the brain processes to generate motor commands in real time manner? This course will provide a strong framework to understand these complex features of the brain function on motor control which uses languages in mathematics and tools in engineering. This course will help the students to acquire a basis for which they design and develop the systems that interact with humans.
Remarks	Those who do not belong to the PhD program in Empowerment Informatics need the permission of the instructor to register.
Course Type	lectures
Course Remarks	A minimum of two students are required. Lecture in English.
Relationship to EMP Educational Objectives	Interdisciplinary ability:Broad specialist knowledge and experience
Course Objectives	
Course Schedule	1)Introduction to Human Robotics 2)Sensorimotor Map 3)Impedance Networks 4)Feedback Control Mechanism in Reflex 5)Autopilot visuomotor control 6)Cortical Representation of body dynamics 7)Muscle Force Distribution and Functional Synergy 8)Optimality in Voluntary Movements 9)Laboratory Work in Human Movement Measurement
Graduating Methods and Criteria	Homework(60%) Lab work(10%) Final Quiz(30%)
Homework	
Textbook	
References	1. The Computational Neurobiology of Reaching and Pointing, Reza Shadmehr and Steven P.Wise (MIT Press) 2. Human Robotics: Neuromechanics and Motor Control, Etienne Burdet, David W Franklin, and Theodore E Milner(MIT Press) 3. 身体知システム論 伊藤宏司 (共立出版)

Office Hour	izawa at emp.tsukuba.ac.jp
Messages for Students	
Teaching Fellow / Teaching Assistant	
Keywords	