

Ph. D. Program in Humanics (5-year Doctoral Program) Course Outline

Ph.D. Program in Humanics
Academic Year 2019

科目番号 Subject No (Shared Code)	形態 Course Type	Subjects	Credit				Module	Time and Date	Chief Faculty Members	Language in Lecture	Outline 科目概要	Note 備考
			Year 1	Year 2	Year 3	Years 4-5						
Common Subjects 共通科目 Initiation Subjects ヒューマニクス入門科目												
02RE001	講義 Lecture 必修 Compulsory	Humanics Forum ヒューマニクス研究フォーラム	1				Spr. (A)	In	Atsushi Kawaguchi	English	Humanics Forum aims to lead the students to find a secondary mentor and to learn the purpose of human resource development and program curricula of the Ph.D. Program in Humanics. Listening to presentations by faculty members and practical lectures by academic researchers, government administrators, and entrepreneurs or researchers who successfully work at business companies. In this seminar, the students will have discussions with their classmates on their study proposals and future career paths, and write a report on their learning objectives and future directions of their study.	
02RE002 (01EQ061)	講義 Lecture 必修 Compulsory	Scientific Ethics 科学倫理	1				Spr. (A, B)	W4	Bryan James Mathis	English	本科目は、従来の講義形式とソクラティックメソッドを用いた双方向的な形式で行う。講義時間外の課題として、学生は精力的なグループディスカッションや感想文の作成が求められる。iTunesでのデジタル・ラーニングが、双方向的な講義を可能にする。 This course will use traditional lectures and interactive presentations in the Socratic method for didactic learning. Students will also convene into groups for intensive discussion and reaction papers will be issued as homework to carry the learning outside of the classroom. Digital learning through iTunes modules will reinforce concepts using interactive technology.	Code-share with 01EQ061 from Master's Program in Medical Sciences
02RE003	実習・実験 Experiment/ Practical Training 選択必修 Compulsory Elective	Basic Experiments in Biomedical Sciences 生命医科学基礎実習	Credit:2 Year 1 or 2				All Year	Ir	Atsushi Kawaguchi	English available	Through working in the laboratories run by program faculty members in Biomedical sciences, the students should be able to understand the outline of the faculty members' researches and the principles of the fundamental experimental techniques involved. They will also practice the techniques learnt.	
02RE004	実習・実験 Experiment/ Practical Training 選択必修 Compulsory Elective	Basic Experiments in Physicalsciences/Engineering/Informatics 理工情報学基礎実習	Credit:2 Year 1 or 2				All Year	Ir	Hiroyasu Ando	English available	Through working in the laboratories run by program faculty members in Physical sciences/Engineering/Informatics, the students should be able to understand the outline of the faculty members' researches and the principles of the fundamental experimental techniques involved. They will also practice the techniques learnt.	
02RE005	演習 Seminar 選択必修 Compulsory Elective	Basic Experiments in Clinicalmedicine 臨床医科学演習	Credit:1 Year 1 or 2				All Year	Ir	Hitoshi Shimano	English available	Through participating in the laboratories/clinical departments run by program faculty members in Clinical medicine, the students should be able to understand the outline of the faculty members' researches and the principles of the fundamental techniques involved. They will also practice the techniques learnt.	
Common Subjects 共通科目 Transferable Skill トランスフェラブルスキル												
02RE101 (01EQ050)	演習 Seminar	English Discussion & Presentation on Medical Sciences I	Credit:2 Year 1,2,3,4, or 5				Spr. (A-B)	F (10:00- 12:30)	Kenji Irie et al.	English	インターネット回線を使った国立台湾大学、京都大学との交流授業、英語による論文紹介と討論を通して、生命科学の知識、および英語によるサイエンスコミュニケーション能力を身につける。Iでは主に細胞の分子生物学について学修する。 Focusing on molecular biology of the cell, <i>International Discussion on Human Biology I</i> provides the opportunities for the students to have interactive online distance learning with the National Taiwan University and Kyoto University, and to engage in thesis presentation and discussion conducted in English. In this course, the students should be able to understand basic knowledge of life sciences and acquire scientific communication skills in English.	Code-sharing with 01EQ050 from Master's Program in Medical Science
02RE102 (01EQ051)	演習 Seminar	English Discussion & Presentation on Medical Sciences II	Credit:2 Year 1,2,3,4, or 5				Fall (A-B)	W1-2	Kenji Irie et al.	English	インターネット回線を使った国立台湾大学、京都大学との交流授業、英語による論文紹介と討論を通して、生命科学の知識、および英語によるサイエンスコミュニケーション能力を身につける。IIでは主にがん生物学について学修する。 Focusing on cancer biology, <i>International Discussion on Human Biology II</i> provides opportunities for the students to have interactive online distance learning with the National Taiwan University and Kyoto University, and to engage in thesis presentation and discussion conducted in English. In this course, the students should be able to understand basic knowledge of life sciences and acquire scientific communication skills in English.	Code-sharing with 01EQ051 from Master's Program in Medical Sciences
02RE103 (02RA070)	演習 Seminar	Communication in Human Biology I ヒューマンバイオロジーのコミュニケーションI	Credit:1 Year 1,2,3,4, or 5				Spr. (A, B)	M2	Ho Kiong	English	文献に基づいたセミナー形式の講義において、ヒューマン・バイオロジーに多大なる影響を及ぼしている最新の科学的ブレイクスルー(飛躍的に進歩を遂げた)研究および古典的テーマについて、評価ならびに再考察を行う。 A literature-based, seminar-type course for the students to evaluate and review the latest scientific breakthroughs and classical topics that significantly impact Human Biology.	Code-sharing with 02RA070 from Ph.D. Program in Human Biology

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02RE104 (02RA080)	演習 Seminar	Communication in Human Biology II ヒューマンバイオロジーのコミュニケーションII	Credit:1 Year 1,2,3,4, or 5				Fall (B, C)	M2	Ho Kiong	English	文献に基づいたセミナー形式の講義において、ヒューマン・バイオロジーに多大なる影響を及ぼしている最新の科学的ブレイクスルー(飛躍的に進歩を遂げた)研究および古典的テーマについて、評価ならびに再考察を行う。 Consists of a literature-based, seminar-type course for the students to evaluate and review the latest scientific breakthroughs and classical topics that have significant impact on Human Biology.	Code-sharing with 02RA080 from Ph.D. Program in Human Biology
02RE105 (02EW033)	演習 Seminar	Research Presentation and Discussion 研究発表と討論	Credit:1 Year 2,3,4 or 5				Spr. (A-C)	W2	Hiroyuki Suzuki	English	自分自身の研究計画や研究成果について、英語で発表し、当該分野の世界の状況をふまえて考察できるとともに、ヒューマンバイオロジーの広い分野の英語での研究発表を理解し、英語で討論する。 In this course, every student will make a presentation in English about their own research plan and achievements. In addition, students can examine the world situation of relevant fields and discuss in English results published in English that are broadly related to human biology.	Code-sharing with 02EW033 from Doctoral Program in Life System Medical Sciences
02RE106	講義 Lecture	Scientific writing and publishing	1				All Year	1r	Atsushi Kawaguchi	English	In this course, students study about the scientific writing and publishing including what makes a great paper, data management, data presentation and so on. This course will also address plagiarism and other ethical issues.	
Common Subjects 共通科目 Problem Discovery Ability 課題設定力科目												
02RE201 (02RA020)	講義 Lecture 必修 Compulsory	World-science Leaders' Seminar 世界のサイエンスリーダーズセミナー	Credit:1 Year 1 or 2				All Year	1r	Atsushi Kawaguchi	English	世界をリードする研究者の専門分野における基礎知識と最近の研究動向を講演から学び、その内容や関連事項についてメンター教員と討論を行うことにより、研究発表と討論の方法を習得すると同時に、研究に関する専門力と目利き力を養う。また、レポートを作成し、研究の進め方について理解を深め、研究遂行能力を養う。 The students attending this seminar should be able to learn basic knowledge and recent research trends related to the specialized fields of world-leading researchers. The students should also be able to develop their professional and 'Cognoscente' skills for research as well as acquire skills of research presentation and discussion by discussing with their mentoring instructors the above topics including related matters. In addition, they are expected to gain a better understanding of research procedures and develop abilities to conduct research by writing a report.	Code-sharing with 02RA020 from Ph.D. Program in Human Biology
02RE202 (02RA030)	講義 Lecture 必修 Compulsory	Business Leaders' Seminar ビジネスリーダーズセミナー	Credit:1 Year 1 or 2				All Year	1r	Atsushi Kawaguchi	English	ビジネスリーダーらによるオムニバス形式の講演を聞き、その要点と自身へのフィードバックをレポートで提出する。 In this seminar, the students will listen to business leaders' omnibus lectures and submit reports on the key points of the lectures for feedback for themselves.	Code-sharing with 02RA030 from Ph.D. Program in Human Biology
Common Subjects 共通科目 Research Executive Ability 研究実行力科目												
02RE301	実験実習 Experiment/ Practical training	International Research Rotation 国際ラボローテーション	Credit:5 Year 1,2,3,4, or 5				All Year	1r	Atsushi Kawaguchi	English	This course offers the students the opportunity to select one or two laboratories that they are interested in from those hosted by the faculty members of the Ph.D. Program in Humanics. The students will then engage in their own research in the laboratories for 4 weeks and discuss with their instructors its objectives, procedures and results. In this course, students should be able to acquire a wide range of research techniques and develop their skills for analysis of research results and get an international mindset.	
02RE302	実験実習 Experiment/ Practical training	Internship in Companies インターンシップ	Credit:5 Year 1,2,3,4, or 5				All Year	1r	Atsushi Kawaguchi	English	In this course, the students are expected to find a possible overseas company for internship and work on-site.	
02RE303 (02RA113)	実験実習 Experiment/ Practical training	Appropriate Technology 適正技術教育	Credit:5 Year 1,2,3,4, or 5				All Year	1r	Kenji Irie	English	現地のニーズ、文化、環境、人などを考慮したうえで、現地の人に必要とされる最善の技術を創出する。それにより、これからの社会で必要とされる問題解決力、現場対応力、起業力を身につける。 In terms of local needs, cultures, environments, and people, <i>Appropriate Technology</i> provides opportunities for the students to develop the optimum technology needed for targeted communities and to generate problem-solving skills, improvisational capabilities, and entrepreneurial abilities for future social needs.	Code-sharing with 02RA113 from Ph.D. Program in Human Biology
02RE304 (01EQ133)	講義 Lecture	Regulatory Science of Medical Products 医薬品・医療機器レギュラトリーサイエンス	Credit:1 Year 1,2,3,4, or 5				Fall (A-C)	1r	Koichi Hashimoto	Japanese	医薬品・医療機器の開発はの薬事法による規制を遵守して実施しなければならない。薬事法による規制と承認審査について体系的に理解する。また、医薬品・医療機器等の品質・安全性・有効性の試験結果を的確に評価するための基盤となる科学(レギュラトリーサイエンス)の概念についても学習する。	Code-sharing with 01EQ133 from Master's Program in Medical Sciences

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02RE305 (01EQ119)	講義 Lecture	Critical Path Research Management 橋渡し研究概論	Credit:2 Year 1,2,3,4, or 5				Fall (A, B)	M6-7	Koichi Hashimoto Satoshi Matsusaka Tsurushima Hideo Masafumi Muratani Takahiro Kojima Takeshi Machino Takeshi Yamada	English	医薬品や医療機器(治療器具、医用材料、治療・診断装置など)等の開発・応用において科学技術的シーズが如何にして臨床現場におけるニーズに結びつけられているかの全体プロセスを理解する。併せてそのプロセスの効率的な運用のために必要な各種の先進的技術、経済的要因、各種規制・手続き、人材等について理解する。 This course aims to equip students with an understanding the process of critical path research and translational research, using to translate the finding in basic research more quickly and efficiently into medical practice.	Code-sharing with 01EQ119 from Master's Program in Medical Sciences
02RE306 (01EQ016)	講義 Lecture	Lecture and Seminar on Research Management (Basic) 研究マネジメント基礎	Credit:1 Year 1,2,3,4, or 5				Spr. (C)	Ir	Koichi Hashimoto	Japanese	研究開発を中心とした各種プロジェクトの推進に必要な様々な専門知識とスキルの基礎を習得する。 This course aims to equip students with an acquiring of the basic knowledge and skill to be needed for the promotion of various research and development projects.	Code-sharing with 01EQ016 from Master's Program in Medical Sciences
Basic Specialized Subjects: 専門基礎科目: Basic Subjects 基礎科目群												
02RE501	講義 Lecture 選択必修 Compulsory Elective	Basic Medical Sciences 生命医学概論	1				All Year	Ir	Atsushi Kawaguchi	English available	In this course, students study about the general aspects of biomedical sciences including the central dogma of eukaryotic cells and physiology/pathophysiology of humans. This course provides you understand the technical terms and establish the basis for proceeding to the specialized subjects.	
02RE502	講義 Lecture 選択必修 Compulsory Elective	Basic Physical Sciences, Engineering, Informatics 理工情報学概論(基礎数学・アルゴリズム)	1				All Year	Ir	Kenji Suzuki Kazumasa Horie	English available	In this course, students study about the general aspects of physical sciences, engineering, and informatics related to humanics including cybernics, artificial intelligence, basic mathematics and computer science. The process of developing a mathematical model from real phenomena is introduced. Topics include recent advancement in these technologies including AI, robotics, and cybernics. This course provides you understand the technical terms and establish the basis for proceeding to the specialized subjects.	
Basic Specialized Subjects: 専門基礎科目: Biomedical Science 生命医科学系科目群												
02RE601 (01EQ131)	講義 Lecture	Human Infection and Immunology ヒトの感染・免疫学	Credit:2 Year 1 or 2				Spr. (A, B)	M3-4	Akira Shibuya	English	病原微生物とヒトの相互関係について、病原微生物の特質と生体防御機構としての免疫から考察し、ヒトの感染症について理解する。 <i>Human Infection and Immunology</i> provides the opportunity for the students to understand infectious diseases through interrelationships between pathogenic microbes and human beings, and study roles of immune systems. The roles of immune systems are to protect the human body from infectious disease.	Code-sharing with 01EQ131 from Master's Program in Medical Sciences
02RE602 (01EQ052)	講義 Lecture	Prominent Discoveries in Neuroscience 神経科学特論	Credit:1 Year 1 or 2				Spr. (A)	Tu, Th 7	Masashi Yanagisawa et al.	English	神経科学分野において重要な論文を読み、内容を深く理解することで、基礎から応用までの幅広い知識を養う。 The goal of this omnibus course is to learn advanced principles in neuroscience, by reading "landmark" papers of historical significance in the broad area of neurobiology chosen by each instructor.	Code sharing with 01EQ052 from Master's Program in Medical Sciences
02RE603 (02RA232)	演習 Seminar	Epigenome Physiology エピゲノム生理学	Credit:1 Year 1 or 2				Spr. (C)	M5-6	Akiyoshi Fukamizu Koichiro Kako Keiko Hirota	English	2つの遺伝情報(ゲノムとエピゲノム)について、生物学的重要性を概説する。また、学生は、2つの遺伝情報に関して自ら選ぶテーマでプレゼンテーションし、質疑応答によって理解を深める。 In this course, the students should be able to grasp the outline of the biological consequences of two genetic codes, genome and epigenome. The students give a presentation on the theme related to these codes and get a better understanding of them by asking and answering questions.	Code-sharing with 02RA232 from Ph.D. Program in Human Biology
02RE604 (01EQ132)	講義 Lecture	Stem Cell Therapy 幹細胞再生医学	Credit:1 Year 1 or 2				Spr. (A, B)	Th3	Osamu Ohneda Toshiharu Yamashita	English	ヒト幹細胞に対する基礎知識を修得し、実際の幹細胞治療の現状と問題点を理解するとともに、将来の幹細胞治療法について討論する。 <i>Stem Cell Therapy</i> engages the students in basic knowledge and application of human stem cells. The students will learn current existing stem cell therapy and also have discussions on future directions of stem cell therapy.	Code-sharing with 01EQ132 from Master's Program in Medical Sciences
02RE605 (02RA120)	講義 Lecture	Human Anatomy and Embryology 人体解剖学・発生学	Credit:2 Year 1 or 2				Fall (A, B)	M3-4	Satoru Takahashi	English	生物の一種としてのヒトの体の構造を細胞、組織、臓器、器官系として理解するとともに、ヒトの発生を理解する。 <i>Human Anatomy and Embryology</i> engages the students in the developmental program of human beings. The students will learn how human beings are organisms and how the bodies of human beings consist of cells, tissues, vital organs, and internal organs.	Code-sharing with 02RA120 from Ph.D. Program in Human Biology

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02RE606 (02RA231)	演習 Seminar	Gene Engineering and Genetically Modified Mice 遺伝子工学と遺伝子改変マウス	Credit:1 Year 1 or 2				Spr. (A-C)	Tu5	Satoru Takahashi	English	遺伝子工学の基本的技術と、その応用である遺伝子改変マウス作製の原理を理解する。また、自身の研究における利用について討論する。 <i>Gene Engineering and Genetically Modified Mice</i> provides the opportunity for the students to study fundamental techniques of gene engineering and principle of making generating transgenic mice which is application of gene engineering. In addition, the students will debate how to use this lecture for their researches.	Code-sharing with 02RA231 from Ph.D. Program in Human Biology
02RE607 (02RA121)	講義 Lecture	Human Pathology and Oncology 人体病理学・腫瘍学	Credit:2 Year 1 or 2				Fall (A, B)	F4-5	Mitsuyasu Kato et al.	English	ヒトの病気の原因、発生機序、形態変化について、循環障害(浮腫、血栓症、梗塞など)、炎症、腫瘍などの基礎的な疾患概念を理解するとともに、代表的な疾患の病理標本を観察して生体内で何が起きているのかを理解できるようになる。 <i>Human Pathology and Oncology</i> provides opportunities for the students to learn about the basic disease entities of circulatory disorders (i.e., edema, thrombosis, and infarction), inflammation, and neoplasia, in terms of the causes, pathogenesis, and morphological changes of human diseases. Examining pathological specimen of common diseases, the students should be able to understand various human in vivo phenomena.	Code-sharing with 02RA121 from Ph.D. Program in Human Biology
02RE608 (01EQ045)	講義 Lecture	Lecture in Human Physiology 人体生理学特論	Credit:1 Year 1 or 2				Spr. (A)	Th4-5	Munetaka Shidara Masayuki Matsumoto Tadachika Koganezawa Takashi Mizuhiki Hiroshi Yamada	English	人体機能のメカニズムに関する様々なトピックを学習する。トピック:循環、呼吸、前頭前野、中脳ドーパミンニューロン、視覚認識、意思決定の神経経済学、情動とモチベーション等。 Understanding human physiological functions. Topics include blood circulation, respiration, prefrontal cortex, midbrain dopamine neurons, visual recognition, neuroeconomics of decision-making, motivation and emotion, etc.	Code sharing with 01EQ045 from Master's Program in Medical Sciences
02RE609 (02RA302)	演習 Seminar	Genomics Database Access and Application ゲノミクスデータベースへのアクセスと利用	Credit:1 Year 1 or 2				Spr. (C)	F5-6	Masafumi Muratani	English	本演習では実際にコンピューター端末を用いて、ゲノミクスデータのダウンロードと第2世代シーケンシングデータの解析を経験することにより、ウェブツールを用いた解析、およびLinux環境でのシェルスクリプティングを用いた解析フローの構築の基礎を学ぶ。 Students will learn how to use genomics databases and bioinformatics tools through hands-on experiences of 2nd-generation sequencing data analysis. This course also provides introduction to Linux shell scripting for constructing semi-automated data processing workflow.	Code-sharing with 02RA302 from Ph.D. Program in Human Biology
02RE611 (01EQ107)	講義 Lecture	Pharmacology 薬理学	Credit:1 Year 1 or 2				Spr. (A,B)	M5	Masayuki Masu Takeshi Sakurai Norihiko Ohbayashi Kensuke Shiomi Kazuko Keino- Masu Yoshihiro Miwa Takuya Okada Yuji Funakoshi	English	1.医学領域における薬理学の概念について学ぶ。 2.生体と内因性及び外因性生理活性物質の相互作用を分子、遺伝子、細胞、個体レベルで学び、薬物・毒物の薬理作用の基本について学ぶ。 The objective of this course is to learn the basic knowledge of pharmacology in the medical field. The students will study the interaction between the living body and endogenous or exogenous biological substances at the genetic, cellular, and individual levels and learn basic principles of drugs and toxins.	Code sharing with 01EQ107 from Master's Program in Medical Sciences
02RE612 (02RA180)	講義 Lecture	Frontier Science in Drug Discovery 創薬フロンティア科学	Credit:1 Year 1 or 2				Fall (A, B)	W5	Satoru Takahashi	English	コンピュータシミュレーション技術を駆使した論理的な新薬開発のプロセスを俯瞰的に基礎から理解する。創薬リード化合物のin silicoスクリーニング/分子設計及びコンビナトリアルケミストリー手法による化学合成から薬物体内動態研究の動向等を学び、医学-薬学の連関を深める。 In this course, the students will be able to grasp the basic concepts of the logical process of drug discovery by using computational simulation technology. They will learn chemosynthesis, by using in silico screening of lead compounds, molecular design, and	Code-sharing with 02RA180 from Ph.D. Program in Human Biology
02RE613 (01AB830)	講義 Lecture	Advanced Bioactive Natural Products Chemistry 生理活性天然物化学特論	Credit:2 Year 1 or 2				Fall (A, B)	T5-6	Hideyuki Shigemori	Japanese	生物の神秘的な生命現象や不思議な生物現象に関わる天然生理活性物質の構造と機能について、天然物化学、生物有機化学的観点から解説するとともに、これらの物質が関与する医薬品や農薬の開発に関して最近のトピックスを交えながら紹介する。 Organic compounds concerning with life and biological phenomena are called "natural products". The investigation of bioactive natural products from plants, animals, and microorganisms is very important to understand the molecular mechanisms for their life and biological phenomena. On the other hand, natural products play an important role in lead compounds for new drug development. This lecture introduces structure of bioactive substances from plants, animals, and microorganisms and the molecular mechanisms for interesting and mysterious biological phenomena and discovering bioactive substances useful for development of drugs and providing biological molecular tools.	Code-sharing with 01AB830 from Graduate School of Life and Environmental Sciences

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			Year 1	Year 2	Year 3	Years 4-5						
02RE614 (02RA233)	講義 Lecture	Signal Transduction and Drug Design シグナル伝達と創薬デザイン	Credit:1 Year 1 or 2				Spr. (A, B)	Th2	Yuji Funakoshi et.al	English	細胞機能を制御する細胞内反応、すなわちシグナル伝達について学習し、さらには、シグナル伝達の破綻が引き起こす疾患について学ぶ。これらを理解した上で、これまでに開発された薬と新薬を開発するためのストラテジーについて学び、創薬研究の基礎知識を習得する。 This course is designed to assist the students to learn about intracellular reactions controlling cellular function, i.e. signal transduction and diseases caused by failure in signal transduction. They should then be able to acquire the basic knowledge of drug discovery research through learning about developed drugs and strategies for development of new drugs.	Code-sharing with 02RA233 from Ph.D. Program in Human Biology
02RE615 (02RA123)	講義 Lecture	Human Endocrinology and Metabolism ヒトの内分泌・代謝学	Credit:2 Year 1 or 2				Spr. (A, B)	Tu3-4	Hiroshi Shimano et.al	English	内分泌組織の発生・解剖・機能、糖脂質代謝に関する生化学、ホルモンの生理機能とホルモン異常の病態について学習し、ヒトの内分泌代謝疾患の成因と発症に至る病態生理について理論的に理解する能力を養う。 This course aims to develop the students' abilities to understand the theory of the pathophysiology of human endocrine and metabolic disease through learning 1) development, anatomy and function of endocrine tissue, 2) glucose and lipid metabolism, and 3) physiological functions of hormones and pathological conditions caused by their failure.	Code-sharing with 02RA123 from Ph.D. Program in Human Biology
02RE616 (01EQ031)	講義 Lecture	Outline of Internal Medicine 内科学概論	Credit:2 Year 1 or 2				Fall (A, B)	W7 Th6	Kunihiro Yamagata Kazutaka Aonuma Tomohiro Kamoda Yasushi Kawakami Keisuke Kuga, Hitoshi Shimano, Hidetoshi Takada, Akira Tamaoka, Shigeru Chiba, Hiromi Hamada Nobuyuki Hizawa Ichinosuke Hyodo Shigeyuki Watanabe Chie Saito, Yoshihiro Seo, Yuichi Hasegawa Yayoi Miyazono Yosuke Matsuno Akiko Ishii Yuya Kondo	Japanese	内科学、小児科学の概要について、特に成人、小児の基本的疾患について疾患概念、発症機序、診断、治療の概要について学ぶ。 This course aims to understand the outline of internal medicine and pediatrics, especially the conceptions and developmental mechanisms of the diseases, diagnosis and treatments in the essential diseases of adults and children.	Code sharing with 01EQ031 from Master's Program in Medical Sciences
02RE617 (01EQ032)	講義 Lecture	Outline of Surgical Disorders 外科学概論	Credit:1 Year 1 or 2				Fall (A, B)	Th5	Yukio Sato Yoshiaki Inoue Masanao Kurata Yuji Hiramatsu Koji Masumoto Shinichi Inomata Tsurushima Hideo Hajime Mishima Tetsuro Wada Hiroshi Kamada	Japanese	外科学の概要を、各科の基本的疾患を中心にそれらの疾患概念、発症機序、診断、治療について学ぶ。 This course aims to equip students with an understanding of outline, epidemiology, mechanism of onset, diagnosis susceptible to surgical treatment as well as the progress and current trend of surgical treatment.	Code sharing with 01EQ032 from Master's Program in Medical Sciences
02RE618 (01EQ034)	演習 Seminar	Laboratory Medicine 臨床検査総論	Credit:1 Year 1 or 2				Fall (A, B)	F3	Yasushi Kawakami Kazuhiro Takekoshi Kazuyoshi Yamauchi Tomoko Ishizu Kazumasa Isobe Takayasu Kato	Japanese	分子生物学の進歩に伴い臨床検査分野でも遺伝子解析技術などの新しい技術が導入され、分子レベルでの"疾患の病態生理学"が構築されようとしている。本検査総論では、実際に疾患をとりあげ、最新の臨床検査医学を概説する。	Code sharing with 01EQ034 from Master's Program in Medical Sciences
02RE619 (02RA130)	講義 Lecture	Biochemistry and Molecular Biology 生化学・分子生物学	Credit:1 Year 1 or 2				Spr. (A, B)	M1	Kenji Irie	English	ヒト生体分子の構造と機能、代謝について学習し、分子レベルの生命現象を理解する。また、細胞の構造と機能についても学習し、細胞レベルの生命現象における分子機能の役割を理解する。 This course is designed for the students to learn about 1) the structure, function and metabolism of human biomolecules to understand life phenomena at the molecular level and 2) the structure and function of human cells to understand their molecular function in life phenomena at the cellular level.	Code-sharing with 02RA130 from Ph.D. Program in Human Biology

Ph. D. Program in Humanics (5-year Doctoral Program) Course Outline

Ph.D. Program in Humanics
Academic Year 2019

科目番号 Subject No (Shared Code)	形態 Course Type	Subjects	Credit				Module	Time and Date	Chief Faculty Members	Language in Lecture	Outline 科目概要	Note 備考
			Year 1	Year 2	Year 3	Years 4-5						
02RE620 (02RA140)	講義 Lecture	Molecular Cell Biology 分子細胞生物学	Credit:1 Year 1 or 2				Fall (A, B)	Tu3	Tomoki Chiba	English	細胞内の基本的な生命現象について、その分子メカニズムに関する最新のトピックスを紹介し、議論する。 In this course, the students will learn about the molecular mechanisms underlying the fundamental cellular events and discuss the latest topics in the field.	Code-sharing with 02RA140 from Ph.D. Program in Human Biology
02RE621 (01EQ004)	講義 Lecture	Clinical Medicine 臨床医学概論	Credit:2 Year 1 or 2				Fall (A, B)	Tu1-2	Junichi Shoda Tetsuaki Arai Yasushi Kawakami Takeji Sakae Takayuki Sumida Kazuhiro Takekoshi Akira Tamaoka Shigeru Chiba Hiroyuki Nishiyama Haruhiko Ninomiya Shinji Takahashi Kensaku Mori Kazumasa Isobe Yusuke Ohara	Japanese	臨床医学の実践とは病める人を対象として、その人の持つ問題点を抽出し、それを把握した上で、その人の価値観と決定に従って治療することである。そしてその患者に満足してもらい幸せになってもらうことを目指している。このような臨床医学の基本的事項と分化した各専門分野の現状についても理解する。	Code sharing with 01EQ004 from Master's Program in Medical Sciences
Basic Specialized Subjects: 専門基礎科目: Physical Sciences/Engineering/ Informatics 理工情報学系科目群												
02RE701 (02RB202)	講義 Lecture	Medical Cybernics メディカルサイバニクス	Credit:2 Year 1 or 2				Fall (A, B)	W3-4	Yoshiyuki Sankai Kenji Suzuki Hiroaki Kawamoto Sandra Milena Puentes	English	医療・福祉・生活分野等における様々な社会課題を解決するため、サイバネティクス、メカトロニクス、インフォマティクスを中心とし、脳・神経科学、ロボット工学、生理学、IT 技術、行動科学、心理学、法律、倫理学、感性学を融合複合した新領域「サイバニクス」(人・ロボット・情報系の融合複合領域)について講義を行う。特に最先端人支援技術・最先端医療技術・社会実装等を事例として基礎から実際までを講究する。 In order to generate solutions to diverse social problems in the medical and welfare fields, we are introducing a lecture covering the novel domain called "Cybernetics". This approach is based on the generation of interdisciplinary research centered on cybernetics, mechatronics, and informatics; integrating diverse subjects as neuroscience, robotics, systems engineering, information technology, "kansei" engineering, ergonomics, physiology, social science, law, ethics, management and economics among others. In particular; this lecture will be based in real-life approaches, studying cases of available cutting-edge support technology, cutting-edge medical technology and social implementation.	Code-sharing with 02RB202 from Ph.D.Program in Empowerment Informatics
02RE702 (02RA225)	講義 Lecture	Computational Structural Biology and Drug Discovery 計算構造生物学・創薬	Credit:1 Year 1 or 2				Fall (A)	M3-5	Hirokawa T, Shoji M, Shigeta Y	English	生命の機能や情報はタンパク質や核酸のような生体分子が担っている。したがって、生命現象の基本原則を明らかにするためには、生体内における分子の構造機能相関(3次元構造と生命機能の関係)の理解が必須である。これまで実験を用いた研究が多くなされているが、その過程が複雑すぎるため、近年、計算機を用いた研究の重要性が増している。本コースでは、計算機による生体内分子の構造と機能の解析、および計算創薬の方法を習得するとともに、実習によってその理解を深めることを目的としている。 Biological functions and information are carried by biomolecules in vivo such as proteins and nucleic acids. Therefore, in order to clarify the basic principle of life phenomena, it is indispensable to understand the structure-function relationships (relation between three-dimensional structure and its biological function) of biomolecules in the living body. Although the relation has been clarified by experimental methods so far, detailed analysis by a computer simulation becomes important in recent years since its mechanisms are extremely complicated. The purpose of this lecture is to learn techniques of structure and function analysis and drug discovery using computers and to deepen their understanding by practical training.	Code-sharing with 02RA225 from Ph.D. Program in Human Biology
02RE703 (01CH304)	講義 Lecture	Data Engineering I データ工学特論I	Credit:2 Year 1 or 2				Fall (A, B)	M3-4	Hiroyuki Kitagawa Toshiyuki Amagasa Hiroaki Shiokawa	English	データマイニングを中心とした大規模データを対象とした先端データ工学技術について論じる。まず、基礎となるデータベース技術、情報検索技術について概観した後、データマイニングの主要な手法と関連するトピックを取り上げる。 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.	Code-sharing with 01CH304 from Graduate School of Systems and Information Engineering

科目番号 Subject No (Shared Code)	形態 Course Type	Subjects	Credit				Module	Time and Date	Chief Faculty Members	Language in Lecture	Outline 科目概要	Note 備考
			Year 1	Year 2	Year 3	Years 4-5						
02RE704 (01CH305)	講義 Lecture	Data Engineering II データ工学特論II	Credit:2 Year 1 or 2					Hiroyuki Kitagawa Hanxiong Chen Kazutaka Furuse		各種の大規模データを対象とした検索支援や知識獲得を中心とした情報検索手法について論じる。まず基本手法についての概論を示し、続いて、検索支援技法、リンク解析等のWebを対象とした各種の知識獲得技法、および、その周辺の話題を取り上げる。 In this course, we discuss techniques for supporting information retrieval, and techniques for mining and acquiring knowledge from various types of information sources. Topics of this course include introduction to basic techniques, techniques for supporting information retrieval, link analysis, web mining, and their related topics.	Code-sharing with 01CH305 from Graduate School of Systems and Information Engineering Open in an even number year Not offered in AY2019	
02RE705 (01CH738)	講義 Lecture	Data Analysis データ解析特論	Credit:2 Year 1 or 2			Fall (A, B)	Th5-6	Taizo Suzuki Yukino Baba Sho Tsugawa	Japanese	研究成果の評価を行う上で重要となるデータ解析について、基礎から最新の手法に至る重要なトピックについて論じ、Rをはじめとするツールを用いた演習を行う。 Major data analysis techniques from the basic to the state-of-the-art, used for evaluation of research results will be discussed. Accompanies exercises using the R language.	Code-sharing with 01CH738 from School of Systems and Information Engineering	
02RE706 (01CH607)	講義 Lecture	Computational Vision Science 視覚計算特論	Credit:1 Year 1 or 2			Spr. (A, B)	Th3	Ko Sakai	Japanese	ヒトの視覚が示す高度な知覚・認識に注目して、生理学・心理学の基礎を交えて、大脳皮質で行われている計算メカニズムを概説する。 The course is an introduction to the human vision, with specific interests on the computational mechanisms of the visual cortex. The course will cover elementary physiology and psychology, as well as computational algorithms.	Code-sharing with 01CH607 from Graduate School of Systems and Information Engineering	
02RE707 (01CH103)	講義 Lecture 演習 Seminar	Advanced Course in Computational Algorithms 数理アルゴリズム特論	Credit:2 Year 1 or 2			Fall (A, B)	F3-4	Tetsuya Sakurai Hiroto Tadano Akira Imakura Shigeru Saito	English	本講義では、計算科学の手法を用いて現象を予測・解析するときに必要となる計算アルゴリズムについて、とくに大規模な線形計算を中心に講義する。 In this lecture, the students will study calculation algorithms which are necessary for estimating and analyzing phenomena, particularly focusing on large-scale linear computation.	Code-sharing with 01CH103 from Graduate School of Systems and Information Engineering Open in an odd number year	
02RE708 (01CH508)	講義 Lecture	Advanced Course in Signal and Image Processing I 信号画像処理特論I	Credit:1 Year 1 or 2			Spr. (A)	M5-6	Hiroyuki Kudo	Japanese	マルチメディアの基盤技術である画像・音声などのメディア情報の符号化(圧縮)と呼ばれる分野について解説する。	Code-sharing with 01CH508 from Graduate School of Systems and Information Engineering	
02RE709 (01CH509)	講義 Lecture	Advanced Course in Signal and Image Processing II 信号画像処理特論II	Credit:1 Year 1 or 2			Spr. (B)	M5-6	Taizo Suzuki	Japanese	マルチメディアの技術である高度なフィルタによる画像処理への応用について解説する。 Some image processing applications of advanced filters, one of multimedia technologies, will be discussed.	Code-sharing with 01CH509 from Graduate School of Systems and Information Engineering	
02RE710 (01CH510)	講義 Lecture	Advanced Course in Signal and Image Processing III 信号画像処理特論III	Credit:1 Year 1 or 2			Spr. (B)	M5-6	Hotaka Takizawa	Japanese	マルチメディアにおける信号画像処理、医用イメージングや計算機診断支援などのトピックスに関して、年度に応じて適当なものを取り上げて解説する。	Code-sharing with 01CH510 from Graduate School of Systems and Information Engineering	
02RE711 (01CH107)	講義 Lecture	Basic Computational Biology 基礎計算生物学	Credit:2 Year 1 or 2			Fall (A, B)	Th1-2	Tetsuya Sakurai Yuji Inagaki Mitsuo Shoji Shoji Makino Mitsuhisa Sato Keiichi Morikuni	English	本講義では、計算機を用いて生物学で現れる各種の問題を解くための基礎的な手法について理解する。分子系統解析、分子動力学法、現象のモデル化とアルゴリズム、高性能計算、成分分析法について説明する。 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.	Code-sharing with 01CH107 from Graduate School of Systems and Information Engineering	

Ph. D. Program in Humanics (5-year Doctoral Program) Course Outline

Ph.D. Program in Humanics
Academic Year 2019

科目番号 Subject No (Shared Code)	形態 Course Type	Subjects	Credit				Module	Time and Date	Chief Faculty Members	Language in Lecture	Outline 科目概要	Note 備考
			Year 1	Year 2	Year 3	Years 4-5						
02RE712 (01CK216)	講義 Lecture	Human-Agent Interaction ヒューマンエージェントインタラクション	Credit:2 Year 1 or 2				Fall (A, B)	W1-2	Hideaki Kuzuoka Hiroataka Osawa	Japanese	ヒューマンインタフェースに関する基礎的な知識を身につけ、自分の研究に生かせるようになる。また、ヒューマンエージェントインタラクション(HAI)に関する設計事例や評価事例を通して、HAI分野の背景知識を学ぶ。受講者が、「人間らしさ」を用いたインタラクションシステムを設計する際に適切な設計ができるスキルを身に付けるとともに、適切な評価手法を選べるようになることを目標とする。 You will acquire basic knowledge on human interface and make it available to your research. In addition, we learn the background knowledge of the HAI field through design cases and evaluation cases on human agent interaction (HAI). The goal is to allow students to acquire the skills to design appropriate interaction systems using "humanness" and to select appropriate evaluation methods.	Code-sharing with 01CK216 from Graduate School of Systems and Information Engineering
02RE713 (01BF204)	講義 Lecture	Spectroscopic Analysis in Materials Science 物質分光分析	Credit:2 Year 1 or 2				Fall (A, B)	W3-4	Hideaki Kano Shigeo Tomita	English available	今日、機能材料の評価に頻りに用いられる物理的手段による分析法のうち、電磁波および荷電粒子線を用いた分光・分析法について、その基礎となる物理と実際の分析機器の動作原理、構造について学ぶ。 Studies on spectroscopic and other analytical measurement methods using electromagnetic waves and charged particle beams, especially their basic physics and structures of actual instruments.	Code-sharing with 01BF204 from Graduate School of Pure and Applied Sciences
02RE714 (01BD156)	講義 Lecture	Advanced Bioorganic Chemistry 生物有機化学特論	Credit:1 Year 1 or 2						Hideo Kigoshi Masahito Yoshida	English available	生物活性天然有機化合物の構造と生体標的分子との相互作用について講義する。また、生命機能解明のための有機合成の役割の一つである多段階合成について、解説する。 This lecture will discuss the structure, classification, chemical synthesis, and reaction with target biomolecules of natural organic compounds for understanding the biological phenomenon as organic chemistry. Moreover, the latest research topics will be introduced to explain the importance of current organic chemistry in the life science field.	Code-sharing with 01BD156 from Graduate School of Pure and Applied Sciences Open in an even number year Not offered in AY2019
02RE715 (01BG509)	講義 Lecture	Biomaterials 生体材料	Credit:1 Year 1 or 2				Fall (A, B)	M2	Tetsushi Taguchi Guoping Chen	English	生きた生体組織に直接的に接触する金属、セラミックス、高分子及び生体由来の生体材料の合成及び性質の基礎を紹介し、生体材料と細胞との相互作用、生体適合性と生体吸収性、表面修飾、接着剤、薬物送達システム、組織置換と再生及び組織工学などを重点において講義する。本講義は英語で行う。 The lecture introduces the basis of the synthesis and characteristics of metal, ceramics, polymers, and biological body-derived biomedical materials that have direct contact with the living body tissue. These all have a mutual influence on biomedical materials and cells, a biocompatibility and bioabsorbable property, surface-modification, adhesive agent, a drug delivery system, tissue replacement and shakeout, and system engineering. These topics will all be reviewed.	Code-sharing with 01BG509 from Graduate School of Pure and Applied Sciences
02RE716 (01CF119)	講義 Lecture	Human Factors ヒューマンファクター特論	Credit:1 Year 1 or 2				Summer Recess	In	Nobuyuki Uchida Genya Abe	Japanese	リスク・レジリエンスに関するヒューマンファクターの諸問題について基礎的概念・理論を説明するとともに、具体的解決の方法について、自動車等の分野における最新の研究動向を含めながら事例を解説する。	Code-sharing with 01CF119 from Department of Risk Engineering in Systems and Information Engineering
02RE717 (01CH301)	講義 Lecture	Programming Environment プログラミング環境特論	Credit:2 Year 1 or 2				Fall (A, B)	Th5-6	Osamu Tatebe Mitsuhisa Sato	English	並列プログラミングやオブジェクト指向プログラミングなど高度な情報処理システムを実現するソフトウェアの開発のための最先端プログラミング言語処理系および開発環境について、論じる。 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.	Code-sharing with 01CH301 from Graduate School of Systems and Information Engineering
02RE718 (01CH307)	講義 Lecture	Advanced System Programming システムプログラミング特論	Credit:2 Year 1 or 2				Fall (A, B)	M5-6	Atusi Maeda Osamu Tatebe	Japanese	システムの設計・開発の基礎となるシステムプログラミングについて、実例をあげて講義し、実習を行う。 Learn about system programming, basis of design and development of computer systems, through lecture and exercise based on concrete examples.	Code-sharing with 01CH301 from Graduate School of Systems and Information Engineering

科目番号 Subject No (Shared Code)	形態 Course Type	Subjects	Credit				Module	Time and Date	Chief Faculty Members	Language in Lecture	Outline 科目概要	Note 備考
			Year 1	Year 2	Year 3	Years 4-5						
02RE719 (02RA181)	講義 Lecture	Structural Biology of Macromolecules 生体高分子の構造生物学	Credit:1 Year 1 or 2				Spr. (B)	Tu1-2	Toshiya Senda et al.	English	生体高分子(タンパク質や核酸)は、細胞内においてその機能を発揮する際に特有の立体構造を必要とする。構造生物学は生体高分子の構造を明らかにし、それらが機能するメカニズムを分子/原子レベルで明らかにしようとする研究分野である。本コースでは、様々な構造生物学的手法を理解し、それらを用いてどのように生命科学や医学に活用されていくかを学ぶ。 When macromolecules (Proteins, DNA, RNA) perform their functions inside a cell, they require specific structures in order to demonstrate their biological roles. Structural biology is a research field that investigates macromolecular structures in order to understand their mechanisms at the atomic/molecular level. This course is designed to assist students in the understanding of structural biology methods, and their applications in life and medical sciences.	Code-sharing with 02RA181 from Ph.D. Program in Human Biology
02RE720 (01CK106)	講義 Lecture	Artificial Intelligence 人工知能特論	Credit:2 Year 1 or 2				Spr. (A, B)	M1-2	Kenji Suzuki	Japanese	物理・情報・機械・心理学・認知神経科学を含む人間-機械系の幅広い視点から人工知能研究について解説し、パターン理解・認知・学習や知識表現といった先進的な概念と、知能システム及び身体性のある知能機械(ロボット)・人支援技術への応用について講義する。	Code-sharing with 01CK106 from Graduate School of Systems and Information Engineering Open in an odd number year
Humanics Specialized Subjects ヒューマニクス専門科目												
02RE801	実験実習 Experiment/ Practical Training 必修 Compulsory	Special Research in Humanics Ia ヒューマニクス基礎実験 Ia	2				Spr. (A-C)	Ir	All Research Supervisors	English	In the Special Research in Humanics Ia, the students will gain practical understanding of the principles and methods of advanced research skills in the particular laboratory which offers the specialized area of study that the students will aspire to focus on.	
02RE802	実験実習 Experiment/ Practical Training 必修 Compulsory	Special Lectures in Human Biology I ヒューマニクス基礎実験 Ib	2				Fall (A-C)	Ir	All Research Supervisors	English	In the Special Research in Humanics Ib, the students will gain practical understanding of the principles and methods of advanced research skills in the particular laboratory which offers the specialized area of study that the students will aspire to focus on.	
02RE803	実験実習 Experiment/ Practical Training 必修 Compulsory	Special Research in Humanics IIa ヒューマニクス基礎実験 IIa		2			Spr. (A-C)	Ir	All Research Supervisors	English	In the Special Research in Humanics IIa, the students will gain practical understanding of the principles and methods of advanced research skills in the particular laboratory which offers the specialized area of study that the students will aspire to focus on.	
02RE804	実験実習 Experiment/ Practical Training 必修 Compulsory	Special Research in Humanics IIb ヒューマニクス基礎実験 IIb		2			Spr. (A-C)	Ir	All Research Supervisors	English	In the Special Research in Humanics IIb, the students will gain practical understanding of the principles and methods of advanced research skills in the particular laboratory which offers the specialized area of study that the students will aspire to focus on.	
02RE805	実験実習 Experiment/ Practical Training 必修 Compulsory	Special Research in Humanics IIIa ヒューマニクス基礎実験 IIIa			Credit:2 Year 3, 4 or 5		Spr. (A-C)	Ir	All Research Supervisors	English	In the Special Research in Humanics IIIa, the students will gain practical understanding of the principles and methods of advanced research skills in the particular laboratory which offers the specialized area of study that the students will aspire to focus on.	
02RE806	実験実習 Experiment/ Practical Training 必修 Compulsory	Special Research in Humanics IIIb ヒューマニクス基礎実験 IIIb			Credit:2 Year 3, 4 or 5		Spr. (A-C)	Ir	All Research Supervisors	English	In the Special Research in Humanics IIIb, the students will gain practical understanding of the principles and methods of advanced research skills in the particular laboratory which offers the specialized area of study that the students will aspire to focus on.	
02RE821	演習 Seminar 必修 Compulsory	Special Seminars in Humanics Ia ヒューマニクス演習 Ia	1				Spr. (A-C)	Ir	All Research Supervisors	English	Special Seminars in Humanics Ia engages the students in the journal club of the particular laboratory which offers the specialized area of study that the students will aspire to focus on. Featuring the latest original research papers, the students should be able to understand the research objectives, methods, and results, and also have advanced discussions on the meanings, problems, and issues facing the research.	
02RE822	演習 Seminar 必修 Compulsory	Special Seminars in Humanics Ib ヒューマニクス演習 Ib	1				Fall (A-C)	Ir	All Research Supervisors	English	Special Seminars in Humanics Ib engages the students in the journal club of the particular laboratory which offers the specialized area of study that the students will aspire to focus on. Featuring the latest original research papers, the students should be able to understand the research objectives, methods, and results, and also have advanced discussions on the meanings, problems, and issues facing the research.	

Ph. D. Program in Humanics (5-year Doctoral Program) Course Outline

Ph.D. Program in Humanics
Academic Year 2019

科目番号 Subject No (Shared Code)	形態 Course Type	Subjects	Credit				Module	Time and Date	Chief Faculty Members	Language in Lecture	Outline 科目概要	Note 備考
			Year 1	Year 2	Year 3	Years 4-5						
02RE823	演習 Seminar 必修 Compulsory	Special Seminars in Humanics IIa ヒューマンクス演習 IIa		1			Spr. (A-C)	Ir	All Research Supervisors	English	Special Seminars in Humanics IIa engages the students in the journal club of the particular laboratory which offers the specialized area of study that the students will aspire to focus on. Featuring the latest original research papers, the students should be able to understand the research objectives, methods, and results, and also have advanced discussions on the meanings, problems, and issues facing the research.	
02RE824	演習 Seminar 必修 Compulsory	Special Seminars in Humanics IIb ヒューマンクス演習 IIb		1			Spr. (A-C)	Ir	All Research Supervisors	English	Special Seminars in Humanics IIb engages the students in the journal club of the particular laboratory which offers the specialized area of study that the students will aspire to focus on. Featuring the latest original research papers, the students should be able to understand the research objectives, methods, and results, and also have advanced discussions on the meanings, problems, and issues facing the research.	
02RE825	演習 Seminar 必修 Compulsory	Special Seminars in Humanics IIIa ヒューマンクス演習 IIIa			Credit:1 Year 3, 4 or 5		Spr. (A-C)	Ir	All Research Supervisors	English	Special Seminars in Humanics IIIa engages the students in the journal club of the particular laboratory which offers the specialized area of study that the students will aspire to focus on. Featuring the latest original research papers, the students should be able to understand the research objectives, methods, and results, and also have advanced discussions on the meanings, problems, and issues facing the research.	
02RE826	演習 Seminar 必修 Compulsory	Special Seminars in Humanics IIIb ヒューマンクス演習 IIIb			Credit:1 Year 3, 4 or 5		Spr. (A-C)	Ir	All Research Supervisors	English	Special Seminars in Humanics IIIb engages the students in the journal club of the particular laboratory which offers the specialized area of study that the students will aspire to focus on. Featuring the latest original research papers, the students should be able to understand the research objectives, methods, and results, and also have advanced discussions on the meanings, problems, and issues facing the research.	
02RE841	演習 Seminar 必修 Compulsory	Special Lectures in Humanics Ia ヒューマンクス特論 Ia	1				Spr. (A-C)	Ir	All Research Supervisors	English	Special Lectures in Humanics Ia provides the opportunity for the students to attend the research progress meetings of the particular laboratory which offers specialized areas of study that the students will aspire to focus on. Featuring the latest research presentations, the students will have discussions on research achievements, learn professional knowledge, and develop their advanced skills to proceed with research activities.	
02RE842	演習 Seminar 必修 Compulsory	Special Lectures in Humanics Ib ヒューマンクス特論 Ib	1				Fall (A-C)	Ir	All Research Supervisors	English	Special Lectures in Humanics Ib provides the opportunity for the students to attend the research progress meetings of the particular laboratory which offers specialized areas of study that the students will aspire to focus on. Featuring the latest research presentations, the students will have discussions on research achievements, learn professional knowledge, and develop their advanced skills to proceed with research activities.	
02RE843	演習 Seminar 必修 Compulsory	Special Lectures in Humanics IIa ヒューマンクス特論 IIa		1			Spr. (A-C)	Ir	All Research Supervisors	English	Special Lectures in Humanics IIa provides the opportunity for the students to attend the research progress meetings of the particular laboratory which offers specialized areas of study that the students will aspire to focus on. Featuring the latest research presentations, the students will have discussions on research achievements, learn professional knowledge, and develop their advanced skills to proceed with research activities.	
02RE844	演習 Seminar 必修 Compulsory	Special Lectures in Humanics IIb ヒューマンクス特論 IIb		1			Spr. (A-C)	Ir	All Research Supervisors	English	Special Lectures in Humanics IIb provides the opportunity for the students to attend the research progress meetings of the particular laboratory which offers specialized areas of study that the students will aspire to focus on. Featuring the latest research presentations, the students will have discussions on research achievements, learn professional knowledge, and develop their advanced skills to proceed with research activities.	
02RE845	演習 Seminar 必修 Compulsory	Special Lectures in Humanics IIIa ヒューマンクス特論 IIIa			Credit:1 Year 3, 4 or 5		Spr. (A-C)	Ir	All Research Supervisors	English	Special Lectures in Humanics IIIa provides the opportunity for the students to attend the research progress meetings of the particular laboratory which offers specialized areas of study that the students will aspire to focus on. Featuring the latest research presentations, the students will have discussions on research achievements, learn professional knowledge, and develop their advanced skills to proceed with research activities.	
02RE846	演習 Seminar 必修 Compulsory	Special Lectures in Humanics IIIb ヒューマンクス特論 IIIb			Credit:1 Year 3, 4 or 5		Spr. (A-C)	Ir	All Research Supervisors	English	Special Lectures in Humanics IIIb provides the opportunity for the students to attend the research progress meetings of the particular laboratory which offers specialized areas of study that the students will aspire to focus on. Featuring the latest research presentations, the students will have discussions on research achievements, learn professional knowledge, and develop their advanced skills to proceed with research activities.	

Not offered in AY 2019

In: Offered Intensively
Ir: Offered Irregularly