

Special Subjects of the Department of Basic Biology

Field	Course Code	Subject	Credit	Content of subject	Instructor
Cell Biology Developmental Biology Environmental Biology Neurobiology Evolution, diversity and genomic biology Reproductive biology	20DBB001**	Introduction To Basic Biology I	2	Introduction of the research conducted at NIBB by all professors, associate professors and assistant professors.	Nobuyuki Shiina Yuriko Komine
	20DBB002**	Introduction To Basic Biology II	2		
	20DBB003**	Cell Biology	1	After Robert Hooke's discovery of the "cell" using a microscope of his own making, the field of cell biology flourished. Thereafter, our knowledge on the cell, a fundamental element of organisms, has drastically expanded, associated with advancement in imaging and experimental technologies. In this course, essence of the discoveries in the cell biology field is delivered, especially focusing on the five topics listed below. 1. Breakthrough technologies in microscopy and imaging 2. Cell structures and intracellular transport 3. Regulatory mechanisms of gene expression 4. Cell cycle regulation 5. Visualization and quantification of cellular dynamics	Takashi Ueda Kazuhiro Aoki Jun-ichi Nakayama Shigenori Nonaka Nobuyuki Shiina Akira Yamashita Tomomi Tsubouchi Shoji Mano Nen Saito
	20DBB004**	Developmental Biology	1	Multicellular organisms such as animals and plants develop from a single cell, a fertilized egg through many rounds of cell division, cell differentiation regulated by complex but precise interactions of tissues, and three-dimensional morphogenesis. In this course, lectures regarding to the formation of body axes, mechanism of cell differentiation, cell movements during development, metabolic regulation, which are all essential processes for the morphogenesis of multicellular organisms. In addition, evolutionary developmental biology (Evo-Devo) aspects of biodiversity are also discussed.	Toshihiko Fujimori Shinji Takada Noriyuki Kinoshita Kensuke Kawade Kenichi Suzuki Hiroki Takahashi
	20DBB005**	Environmental Biology	1	This lecture course provides you with opportunity to study how living organisms interact with environments. The effects of several environmental factors such as light, gravity, and temperature on living organisms, and their response to the environmental factors will be lectured. In particular, seminal topics on photoacclimation/adaptation mechanism of plants including photosynthesis, and mechanical principles of plant movements and molecular mechanisms of plant response to gravity will be discussed.	Jun Minagawa Miyo Morita-Terao Yasuhiro Kamei Makio Yokono Eunchul Kim Takashi Nishimura Hiromasa Shikata
	20DBB006**	Neurobiology	1	In this course, lectures on three topics in neuroscience will be delivered: 1. Development of the neurons system. 2. Organization and function of locomotor circuits in the spinal cord. 3. Mechanisms underlying the information processing in the retina and brain. Basic knowledge and future topics will be discussed in historical perspective.	Shinichi Higashijima Eiji Watanabe
	20DBB007**	Evolution, diversity and genomic biology	1	The course will introduce seven topics on modern evolutionary biology covering the fundamentals of the methods for comparative genomics analyses. The first topic includes variant detection, orthology analysis, whole genome comparison and detection of selection signature. Continuously, it will introduce the evolutionary mechanism that brings about the diversity of plants and animals. Development and resulted morphology in bryophytes, lycopods, monilophytes, gymnosperms, and angiosperms will be discussed with incorporating the inference of the common ancestor of land plants and subsequent evolution. Turnovers of sex determination genes have frequently happened during the evolution of vertebrates. Genetic and genomic basis of this phenomenon will be discussed using fish as models. The evolutionary novelties acquired by insects through evolution will be discussed. Flagella in eukaryotes are the molecular machinery composed of tubulins and other proteins. Roles of tubulin superfamily genes will be discussed in relation with microtubule and flagella structures. Arbuscular mycorrhiza and root nodule symbioses are mutually successful and beneficial interactions on earth. The evolution of plant-microbe symbioses by recruiting or neo-functionalizing common factors will be discussed.	Masayoshi Kawaguchi Mitsuyasu Hasebe Teruyuki Niimi Kiyoshi Naruse Shuji Shigenobu Takashi Soyano Kenji Takizawa Ikuo Uchiyama

Field	Course Code	Subject	Credit	Content of subject	Instructor
Cell Biology Developmental Biology Environmental Biology Neurobiology Evolution, diversity and genomic biology Reproductive biology	20DBB008**	Reproductive biology	1	Reproduction is indispensable for the continuity of life. In this class, a number of fundamental questions during the course of reproduction starting from germ cell formation to fertilization will be lectured using a variety of organisms (e.g., yeast, fly, fish, and mouse). Further, the lecturers will talk about practical issues of researchers with regard to how to select the organisms to study or how to challenge the long-term and short-term biological questions.	Shosei Yoshida
	20DBB034**	Communication in Science	1	Students will learn how information is exchanged between academic researchers and broader society, and also discuss how this exchange can be conducted more effectively.	Tomoko Kurata Satoshi Mayama Hitoshi Yamaoka
	20DBB009**	Practical Spoken English I a	1	Communication and Presentation courses focus on improving and building the communication and presentation skills necessary for researchers. Classes incorporate both lecture and student practice exercises touching on subjects such as handling questions, presenting clear, logical arguments, etc.	Sechrist, Jeremiah S Noriyuki Kinoshita
	20DBB010**	Practical Spoken English I b			
	20DBB011**	Practical Spoken English II a			
	20DBB012**	Practical Spoken English II b			
	20DBB013**	Practical Spoken English III a			
	20DBB014**	Practical Spoken English III b			
	20DBB015**	Practical Spoken English IV a			
	20DBB016**	Practical Spoken English IV b			
	20DBB017**	Practical Spoken English V a			
	20DBB018**	Practical Spoken English V b			
	20DBB019**	Practical Scientific Writing I a	1	Lectures and practice to expand English literacy in science	Takashi Ueda Noriyuki Kinoshita Yuriko Komine
	20DBB020**	Practical Scientific Writing I b			
	20DBB021**	Practical Scientific Writing II a			
	20DBB022**	Practical Scientific Writing II b			
	20DBB023**	Practical Scientific Writing III a			
	20DBB024**	Practical Scientific Writing III b			
	20DBB025**	Practical Scientific Writing IV a			
	20DBB026**	Practical Scientific Writing IV b			
	20DBB027**	Practical Scientific Writing V a			
	20DBB028**	Practical Scientific Writing V b			
	20DBB029**	Advanced Conference I	1	Attending an international meeting held at NIBB, students are exposed to frontier research topics and engage in discussion with senior researchers.	Shinji Takada
	20DBB030**	Advanced Conference II			
	20DBB031**	Advanced Conference III			
	20DBB032**	Advanced Conference IV			
	20DBB033**	Advanced Conference V			

A two-digit number or letter will be entered to ** according to the semester or the lecturer in charge.