

The Department of Bio-Mechatronic Engineering Course Catalog (Undergraduate)

Code	Course	Type	Category	Credit	Description
EBM2001	Statics	Theoretical Study	Major	3	Deals with the state of rest of bodies under the action of forces. The study of statics is directed toward the quantitative description of forces that act on engineering structures in equilibrium. Including basic concepts of mechanics, Newton's laws, forces system and its vector analysis, moment and couple, equilibrium conditions, structures, distributed forces, friction, virtual work and area moment of inertia.
EBM2003	Bio-Image Process Engineering	Theoretical Study	Major	3	Students will learn and understand the overall concept and basic theory of computer image process technologies in the field of bio-system. Understanding of principal processing algorithms and design capability of computer vision system will be emphasized. Element of bio-image processing system, camera modeling and image geometry, image transformation, image enhancement will be covered and applications dealing with biological objects are introduced in the lecture.
EBM2004	Electric and Electronic Application for Bio-Production	Theoretical Study	Major	3	Students will learn and practice the basic engineering design principle by applying fundamental mechanics and kinematics to the machine elements of bioproduction machinery and automation device. This course will cover the basic design principle of bearing, gear, brake, spring and etc. Operating principle and function of the major bioproduction machineries will be analyzed. Basic kinematic synthesis techniques will be introduced with computer practice.
EBM2006	Applied Hydraulics and Fluid Machinery	Theoretical Study	Major	3	Understanding the basics of fluid mechanics and the water utilization in agriculture, students will obtain the knowledge about irrigation pumps and its utilization technique.
EBM2007	Applied Strength of Materials in Bio-Systems	Theoretical Study	Major	3	Students will understand the physical behavior of the materials and bio-materials of the system elements and learn the basic theory and concept between force and deformation via modeling process. Basic theory and concept related to the internal stress of materials and bio-materials under external load, deformation, and fracture will be introduced through this course. Those basic theories and concepts will be applied to design the machine element and structure in biological production system. Finally, students will learn the ability of the engineering prediction on the physical effect and stability analysis related to the strength of materials for the given system.
EBM2008	Introduction of Biomedical Engineering	Theoretical Study	Major	3	Biomedical engineering is a field of study that not only analyzes new phenomena and solves problems by applying theory and method of the traditional engineering to biology and medicine but puts to the clinical treatment. And it applies principle of biosystem and human body system in the field of engineering for the ultimate purpose of providing an overall enhancement of health care. Thus the object of this course is to develop students' capacities to think and study for themselves by providing the basic theory about biomedical engineering and the method to approach to phenomena scientifically.

EBM2011	Microprocessor Application	Theoretical Study	Major	2	Microprocessor organization, its characteristics and programming techniques are introduced. This course deals with application of computer technology in bio-system considering engineering aspects. The course is designed to help students in the use of one-board microcomputer technology for problem solving.
EBM2012	Microprocessor Application Laboratory	Laboratory Course	Major	1	A 8051 microprocessor training kit will be used to develop programs in the laboratory. The course deals with the basic concepts used in hardware and software technologies to control external peripherals. The course is designed to develop programs to control LED ports, LCD display module, dot matrix LED display panel, traffic signals, and A/D converter.
EBM2015	Applied Mechanics	Theoretical Study	Major	3	Deals with the motion of the bodies under the action of forces. Dynamics has two parts; kinematics, which is the study of motion without reference to the force which cause motion, and kinetics, which relates the action of forces on bodies to their resulting motion. Including basic concepts, kinematics and kinetics of particles, plane kinematics and kinetics of rigid bodies, three dimensional dynamics of rigid bodies and mass moment of inertia. Introducing the fields of bio-mechatronics engineering study, this course intends to help students to establish the effective future study plan.
EBM2017	Computer Applied Drawing	Theoretical Study	Major	2	Fundamental method of machine drawing including plane geometry, projection, section, auxiliary view, special projection, dimensioning, surface roughness, tolerance etc. for specific machine elements in bio-mechatronic engineering.
EBM2018	Computer Applied Drawing Practice	Laboratory Course	Major	1	Practice sessions of computer applied drawing demonstrate them both drawing by hand and using CAD(computer aided design)
EBM2019	Applied Statistics	Theoretical Study	Major	3	Basic concepts of statistical analysis and experimental designs are converted in this course, and basic techniques such as analysis of variance, regression analysis, testing hypothesis and experimental designs are to be discussed.
EBM2020	Medical Imaging System Engineering	Theoretical Study	Major	3	Introduction to medical imaging system, basic concepts and methods used for medical image analysis, methods and algorithms used for 3D reconstruction and display of medical images, and basic concepts and methodologies used of computer aided diagnosis (CAD) with medical images.
EBM2022	Engineering Mathematics	Theoretical Study	Major	3	Methods for solving ordinary differential equations including Laplace transform power series, matrix. Techniques for operating linear equations, linear dependence, vector spaces, inner products, cross-multiplication, linear transformations, matrices, determinants, eigenvalues, eigenvectors with applications to differential equations. Example and applications in biological and behavioral engineering.
EBM2023	Applied Computer Programming	Theoretical Study	Major	3	Introduction to structured problem solving, algorithm development and computer programming with modern high-level structured programming language including data representation, data structures and application of data structures in sort and search algorithms.

EBM2024	Introduction of Bio-Mechatronics	Theoretical Study	Major	3	Biomechatronics is a fusion technology including bio, mechanics, electrics and computer engineering. This course is designed for students to give brief view of the disciplinary of Biomechatronics. In the course, lecture will be given for student in the filed of Biomedical engineering and Mechatronics. Biomedical engineering area will cover biomechanics, biomaterials, bio-sensor and bio-electrics/computer. In addition Mechatronics area will cover biosystem, off-load vehicle, computer vision/system and robotis.
EBM2026	Application thermodynamics	Theoretical Study	Major	3	The applied thermodynamic is a subject for students that major in bio-mechatronics, bio-medical engineering, mechanical engineering. The contents of this subject lead student to understand first and second laws of thermodynamics, reversible and irreversible processes, and introduction to basic thermodynamic cycles. In addition, through this course, thermodynamic system applied in the various biomedical apparatus can be learned.
EBM3003	Sensor Engineering for Bio-System	Theoretical Study	Major	3	Measuring principles and components of sensors applied for bio-system are introduced. This course deals with the basic concepts and techniques to measure properties of plants and animals with bio-sensors. The course covers sensor materials, calibration, characteristics of output signals, sensor interface and characteristics of sensors. Sensors included are electrical sensor, electromagnetic sensor, piezoelectric sensor, optical sensor, acoustic sensor, and bio sensors.
EBM3004	Bio-Production Machinery	Theoretical Study	Major	3	Deals with the functional requirements and basic principles of mechanics and equipments for production and handling of biological products. Including implement types, field capacities and costs, soil tillage and dynamics, crop planting, spraying and dusting, grain and seed harvesting, and root crop harvesting.
EBM3007	Biomechanics	Theoretical Study	Major	3	Principles of solid and fluid mechanics applied to analytical and experimental investigation of cardiovascular and skeletal system.
EBM3008	Applied Machine Element Design	Theoretical Study	Major	3	Students will learn the basic engineering design principle of machine elements of complex bio-mechatronic machineries in bioproduction. This course will cover the basic design principle of bearing, gear, brake, spring and etc. Operating principle and function of the major bioproduction machineries will be analyzed. Basic kinematic synthesis techniques will be introduced with computer practice.
EBM3011	Craftsmanship in Bio-Mechatronics	Theoretical Study	Major	2	Understanding the basic principles and theorems to construct the systems and apparatus commonly used in the filed of bio-mechatronics engineering, processing characteristics of various materials, and the usage of basic machine tools.
EBM3012	Shop Practice in Bio-Mechatronics	Laboratory Course	Major	1	Exercise the practical technique of craftsmanship through the peactise of material selection, tin smith, welding, and operation of machine tools.
EBM3014	Measurement and Instrumentation for Bio-System	Theoretical Study	Major	2	The course provides a study of operating principles and components of various measurement systems to design an accurate data acquisition system without error. The theory and practical application of measurement will be focused. The course investigates method of measurement, components of measuring system, data analysis, characteristics of input signals, measuring system response, characteristics of sensors, signal conditioning, operating characteristics of readout unit, and treatment of uncertainties.

EBM3015	Laboratory of Measurement and Instrumentation for Bio-System	Laboratory Course	Major	1	The laboratory course provides a study of operating principles and operation of various measurement systems to sense the signals without error. Topics included are response of measurement system, analysis of measured data, signal processing form the sensor, and etc. Applied method to measure displacement, stress, force, rotational speed, torque, pressure, fluid flow, temperature, humidity, heat flux, light, acoustical will also be covered.
EBM3017	Robotics in Bio-Systems	Theoretical Study	Major	3	Students will learn the overall process automation technologies in the field of bio-systems. Mechanism analysis and design of simple automatic device, kinematic linkage analysis in 3 dimensional space and task programming for the robot manipulator will be introduced through this course. Various robot applications in bio-systems field, characteristics of robot task, and kinematic and kinetic design analysis will be also introduced. Students will acquire the basic system design for robotic automation.
EBM3018	Theory of Off-Road Vehicles	Theoretical Study	Major	3	This course is an analytical study of design, construction and operating characteristics of off-road vehicles. The following areas will be emphasized : off-road vehicle types and development, power transmission system, tire, steering system, hitches, hydraulic control system, electrical system, traction, stability of vehicles, vehicle test and performance, and human engineering in vehicle design.
EBM3020	Biomechanics of Movement	Theoretical Study	Major	3	Engineering mechanics applied to analyzed human movement, including models of muscles and tendon, kinematics of joints and dynamics of multijoint movement. Applications in sports, rehabilitation, and orthopaedics.
EBM3021	Introduction of Biomaterial	Theoretical Study	Major	3	This course introduces undergraduate students to the use of artificial and natural materials in the human body. The concept of biocompatibility is developed, and includes the mechanical, electrochemical, immunological, and toxicological aspects of compatibility between materials and the body environment. Each student is required to complete and orally present a term project, half of which involves the design of an implant or prosthesis which must function within the body.
EBM3032	Biomechatronics Industrial training 1A	Field Education	Major	2	The class is opened during the regular semesters and managed as a Regular Clss-base. Students are strongly encouraged to achieve industrial experinece through the Program-base Industrial training class.
EBM3033	Biomechatronics Industrial training 1B	Field Education	Major	2	The class is opened during the regular semesters and managed as a Regular Clss-base. Students are strongly encouraged to achieve industrial experinece through the Program-base Industrial training class.
EBM3034	Biomechatronics Industrial training 2A	Field Education	Major	3	The class is opened during the regular semesters and managed as a Regular Clss-base. Students are strongly encouraged to achieve industrial experinece through the Program-base Industrial training class.
EBM3035	Biomechatronics Industrial training 2B	Field Education	Major	3	The class is opened during the regular semesters and managed as a Regular Clss-base. Students are strongly encouraged to achieve industrial experinece through the Program-base Industrial training class.
EBM3036	Biomechatronics Industrial training 3A	Field Education	Major	4	The class is opened during the regular semesters and managed as a Regular Clss-base. Students are strongly encouraged to achieve industrial experinece through the Program-base Industrial training class.

EBM3037	Biomechatronics Industrial training 3B	Field Education	Major	4	The class is opened during the regular semesters and managed as a Regular Clss-base. Students are strongly encouraged to achieve industrial experinece through the Program-base Industrial training class.
EBM3039	Biomechatronics Industrial training 4B	Field Education	Major	5	The class is opened during the regular semesters and managed as a Regular Clss-base. Students are strongly encouraged to achieve industrial experinece through the Program-base Industrial training class.
EBM3040	Biomechatronics Industrial training 5A	Field Education	Major	6	The class is opened during the regular semesters and managed as a Regular Clss-base. Students are strongly encouraged to achieve industrial experinece through the Program-base Industrial training class.
EBM3041	Biomechatronics Industrial training 5B	Field Education	Major	6	The class is opened during the regular semesters and managed as a Regular Clss-base. Students are strongly encouraged to achieve industrial experinece through the Program-base Industrial training class.
EBM3046	Applied Numerical Analysis	Theoretical Study	Major	3	This lecture covers numerical methods for engineering and science students and deals with numerical analyzing methods of simultaneous linear algebraic equations, nonlinear equations, differentiation, integration, ordinary differential equations, and curve fitting.
EBM3047	Bio-signal Process Engineering	Theoretical Study	Major	3	This course provides a study of acquiring biomedical signals such as blood pressure, electrocardiogram, and ultrasound image in a time domain, analyzing in a frequency domain, and designing the system in a digital domain. In the first half, the course deals with interpreting a sinusoidal signal and other basic signal processing theory such as Fourier transform, Sampling, and z-transform. The second half deals with analysis of signal in a frequency domain, transforming an analog biomedical signal into a digital signal, and designing an optimal system in a digital domain which could process the transformed signal.
EBM3055	Thesis Research	Independent Research	Major	3	Research for the preparation of B.S thesis. Research for the preparation of B.S thesis. Research for the preparation of B.S thesis
EBM3056	System Facilities Automation	Theoretical Study	Major	3	Principles of stepping motor and driver, DC servomotor and driver, automatic speed/current controller, brushless motor and diriver, vector control invertor, under-voltage power system in biological and behavioral engineering. Theory and practical experinece using a variety of microprocessor peripheral chips with specific microcomputer systems.
EBM3058	Applied System Control Engineering	Theoretical Study	Major	3	Course includes brief review of mathematical modeling and response analysis of various systems such as mechanical, electro-mechanical, and bio systems. And fundamental principles of a feedback control system and its response characteristics based on the system stability and sensitivity are treated. Students acquire design tools for the feedback control system such as 1. Root-Locus Design, 2. Frequency Response Design, and 3. State-Space Design methods for the feedback control system. Through the case studies students also learn the overall design process of typical feedback control systems.

EBM3059	Applied Dynamics of Machines	Theoretical Study	Major	3	Deals with the relative motion of machine parts, and the forces acting on the parts of a machine and the motion resulting from these forces ; Fundamental concepts, properties of motion, relative motion, methods of motion transmission, linkages, cams, gears, instant centers, velocities and acceleration in mechanism, velocity and acceleration graphs, static and dynamic forces in machines.
EBM3060	Computer Aided Design	Theoretical Study	Major	2	This class is designed for students to educate CAD system. Pro/E and ADAMS will be employed in the class as a tool.
EBM3063	Electric medical system technology	Theoretical Study	Major	3	The electric medical system technology is a subject for students that major in bio-mechatronics, bio-medical engineering, relative electronics, mechanics and life science technology. The contents of this subject lead student to understand principle & system composition of various kinds of medical instrumentation such as therapeutic devices, diagnosis devices, medical imaging system and nuclear medicine diagnosis system. In addition, students will learn to apply latest high medical convergence system with electric circuit & various sensors in medical system.
EBM3064	Bio-System control technology	Theoretical Study	Major	3	The Bio-System control technology is a subject for students that major in bio-mechatronics, bio-medical engineering, mechanics and relative electronics. The contents of this subject lead student to understand analysis principle & system composition of various kinds of automatic control system. In addition, student will study to the composition and modelling method of control system, and apply automatic control theory to human body system and various bio-system after studying feedback system, control loop and a controller. Students will learn that the system with input value is controlled to desired result value in process.
EBM3066	Design of Bio-System	Theoretical Study	Major	2	The bio-system is a subject for students that major in bio-mechatronics, bio-medical engineering. Why our blood vessel is similar like a garden hose. Why are seashells strong even though they are made of chalk? How can our opaque white tendons be made of the same material as our transparent corneas? Additionally, this course may learn about biomedical scaffolds for tissue engineering and biomimetic materials, which can be derived from Nature.
EBM3067	Experimental design of Bio-System	Laboratory Course	Major	1	The design of bio-system is a subject for students that major in bio-mechatronics, bio-medical engineering. Why our blood vessel is similar like a garden hose. Why are seashells strong even though they are made of chalk? How can our opaque white tendons be made of the same material as our transparent corneas? Additionally, this experimental course may learn about biomedical scaffolds for tissue engineering and biomimetic materials, which can be derived from Nature.
EBM3068	Bio-microfabrication	Theoretical Study	Major	3	The applied heat transfer is a subject for students that major in bio-mechatronics, bio-medical engineering, mechanical engineering. The bio-microfabrication is the application of micro-fabrication methods to build tools for exploring the mysteries of biological systems. This course will cover the basics of biology and the principles and practice of micro-fabrication techniques with a focus on applications in biomedical and biological research. A team design project that stresses interdisciplinary communication and problem solving will be one of the course requirements.

EBM3069	Advanced machine parts design	Theoretical Study	Major	3	The advanced machine parts design is a subject for students that major in bio-mechatronics, bio-medical engineering, relative electronics, mechanics and life science technology. The contents of this subject lead student to understand principle & system composition of various kinds of electric, electronic and machine parts on newest automated machine system. students will learn to apply latest automation system.
EBM3070	Applied heat transfer	Theoretical Study	Major	3	The applied heat transfer is a subject for students that major in bio-mechatronics, bio-medical engineering, mechanical engineering. The contents of this subject lead student to understand the thermal energy in transit, due to a spatial temperature difference (conduction, convection, and radiation). In addition, through this course, the heat transfer system applied in the various biomedical apparatus can be learned.
EBM3071	Practice of computer aided design	Laboratory Course	Major	1	'Practice of computer aided design' is a course for the students majoring in biomechatronics engineering, biomedical engineering, mechanical engineering, electrical and electronic engineering, and industrial engineering. As a first step for the computer simulation based analysis, 3D object modeling will be practiced in this course. 3D CAD programing skill as a basic quality that should have as an engineer, it has been applied to various industrial sites, and recognized as a fundamental skill in the research field. In this course, creation and analysis of solid features, parts assemblies, cartography and analysis, and model management will be treated.
FBT3016	Food Marketing	Theoretical Study	Major	3	Outlines of scientific technology in food distribution, such as ensuring safety of food products and preserving nutritional component during the distribution periods. Instruction of distribution industry, analysis of market, marketing, and sales technique.
FBT3046	Food Process Engineering	Theoretical Study	Major	3	Main goal of the course is to understand how engineering principles are applied into food processing systems. Transport processes and unit operations (evaporation, drying, extraction, distillation, membrane separation) related with food processes will be discussed.
FBT3068	Bio-product development	Theoretical Study	Major	3	Bio-product development deals with how to develop bio-products including foods, pharmaceutical products and cosmetics. This course will provide knowledge of steps for the development including concept developing methods, prototype developing methods and final product development. This course will be composed of lectures and team projects organized by students. The final objective of this course is to launch imaginary and creative bioproducts by students.
GEN2029	Biometry	Theoretical Study	Major	3	Biometry is intended as an introduction to probability and statistical inference in applied disciplines, such as engineering, food technology and life sciences. This lecture is illustrated with realistic examples and is verbalized in an way that students can obtain ans intuitive understanding of the concept.
GEN3059	Biochemical Engineering	Theoretical Study	Major	3	Rapid overview of relavant microbiology, biochemistry, and molecular biological process industries such as enzyme technology, fermentation technology and recombinant cell cultivat technology. Design and analysis of biological reactors and bioseparation processes by integrating biological properties and basic engineering principles. Measurement, data anlysis, control and scale-up for bioreaction and biosepa-ration precesses.

COV3006	Revolutionary discovery in Biomedical sciences	Theoretical Study	Major	2	<ul style="list-style-type: none"> ● This course will provide in-depth introduction to revolutionary discoveries including Novel prize-winning research in biomedical sciences. ● Therefore, students will learn about important research trends in modern biomedical science and its theoretical background.
BIT4002	Advanced Measurement and Instrumentation	Theoretical Study	Major	3	The course provides a study of operating principles and characteristics of basic components for various measurement systems to design a data acquisition system for bioproduction. The course investigates components and operating principles of instrumentation, error analysis, measuring system response and calibration of measurement system, and treatment of uncertainties. Method to measure mechanical physical, and biochemical characteristics of agricultural products will also be covered.
BIT4003	Advanced Bio-Production Machinery	Theoretical Study	Major	3	Deals with the functional requirements and principles of operations for the basic types of field machines. Topics includes research and development in farm machinery, soil tillage and dynamics, hydraulic power transmission and implement, crop planting, spraying and dusting, grain and seed harvesting, root crop harvesting.
BIT4007	Advanced Molecular Biology	Theoretical Study	Major	3	Structure and function of chromosome, properties of plasmids, gene structure, genetic code and genetic engineering, gene replication, gene exchange, gene cloning, utilization of useful genes into plants and animals, human genome projects, etc.
BIT4008	Advanced Food Biochemistry	Theoretical Study	Major	3	Study of biochemical and functional properties of food components in relation to their roles as parts of complex biochemical systems.
BIT4009	Functional Food Processing	Theoretical Study	Major	3	Principles of manufacturing various functional foods and functional food stuffs.
BIT4010	Advanced Biotechnology for Animal Production	Theoretical Study	Major	3	Biotechnology is advancing rapidly opening new horizons for livestock production and much has already achieved. This course is designed for studying the role of biotechnology in animal nutrition, physiology, animal health, reproduction and genetics for 21
BIT4011	Food Analysis	Theoretical Study	Major	3	Application and development of quantitative techniques to the determination of composition and quality of food products
BIT4012	Advanced Food Manufacturing	Theoretical Study	Major	3	This subject teaches about food manufacture including the selection of raw materials, the manufacturing procedures, and the quality control during distribution periods for the traditional foods such as soy sauce, red pepper sauce or soybean sauce, the pro
BIT4015	Advanced Applied Microbiology	Theoretical Study	Major	3	Application of microorganisms, classification of soil microorganisms, properties and utilization of food microorganisms, probiotics for human and animals, environmental microorganisms, medical and medicine of microbiology, anaerobic bacteria, distribution
BIT4016	Advanced Genetics	Theoretical Study	Major	3	this subject deals with general genetic phenomena such as the chromosome structure, gene expression, DNA replication, mutation, chromosomal aberration, and evolution.
BIT4017	Advanced Bioresources Technology	Theoretical Study	Major	3	Lectures on Introduction to bioresources technology , History of the development of bioresources technology, Generation of genetically modified animals, plants, and microorganisms using the state-of-arts gene manipulation methodologies, Analysis of GMOs at
BIT4018	Advanced Cell Biotechnology	Theoretical Study	Major	3	Advanced topics in the field of cell biology that covers the structures and functions, the interactions between cells, and signal transductions of the cell as a unit of life, and basic and advanced technology to study cell biology and its application. Thi

BIT4020	Advanced Biological Chemistry	Theoretical Study	Major	3	Students present brief reviews on selected topics of biological importance. Discussion is carried out principally by graduate students with recent papers.
BIT4021	Advanced Biochemical Engineering	Theoretical Study	Major	3	The course involve lectures and hands-on work in biochemical engineering together with complementary engineering or bioscience. Course include pilot-scale studies in a research plant with computer-linked fermenters, extensive down-stream processing equipm
BIT4023	Advanced Microbiology	Theoretical Study	Major	3	An in-depth coverage of current concepts in microbiology. Topic areas will include the structure and function of microbial cell, microbial metabolism, microbial fermentation, microbial growth and control, and microbial genetics. The course will consist of
BIT4024	Advanced in Embryology	Theoretical Study	Major	3	This lecture is intended to supplement and enrich courses in developmental biology. It provides means information for advanced students on issues of developmental biology in animal and human. 1. gene cloning of animal and human genes 2. utilgation stem cells 3. Begining a new organism 4. early embryonie development in animal and fuman 5. late embryonie development in animal and fuman 6. An overview of plant development
BIT4026	Advanced Viral Immunology	Theoretical Study	Major	3	Lectures and discussions concerning concepts on the virology. Topics include structure, classification, purification and identification, host-virus interactions, tumor viruses and antiviral agents.
BIT4027	Advanced Immumology in Disease	Theoretical Study	Major	3	Understanding the immune system in normal and diseases, and further studying immunotherapeutic strategies through discussing the most research trend and biotechnology.
BIT4029	Problem Based Learning of Protein Engineering	Theoretical Study	Major	3	In this class, students learn topics related to protein engineering by solving given problem set themselves. Students can raise their trouble-shooting ability. Structure-function relationship of proteins and application to the industry is lectured in this course. Course is composed of lectures including protein production, purification, characterization, structure, kinetics, regulation, modification of its activity, functional mechanism and analysis.
BIT4030	Proteomics	Theoretical Study	Major	3	Proteomics is the qualitative and quantitative comparison of proteomes under different conditions to further unravel biological processes. Related technologies are lectured.
BIT4031	Molecular Cosmetic Dermatology	Theoretical Study	Major	3	Cosmetic dermatology is the practice of developing functional products related to skin and hair. Knowledge and technologies are lectured based on skin structure and physiological function, which can be extended to develop novel cosmoceuticals. In this lecture, cosmetic dermatology is lectured at molecular level.
BIT4032	Special Topic in Material Properties of Food	Theoretical Study	Major	3	This course is an integrated introduction to material properties and characteristics of various food materials such as fruit, vegetable, cereal, dairy, seafood and meat. This course provides an overview of the scientific knowledges, such as biochemical, physical and nutritional properties, of raw materials for their processing, preservation, and distributions. This class mainly delivers lectures including group discussions in each topics.

BIT4034	Advanced immunological disease study	Theoretical Study	Major	3	This class explains theoretic background of immunological disease models and methods to establish proper animal models to study. In particular, setting up the experimental conditions and the production of knock-out mouse will be presented.
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