

International Bioindustrial Sciences Course

COMMON CORE UNITS

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
02AP001	Special Research in Bioindustrial Sciences I	3	6.0	1, 2	Annual	by request		Kazuo Watanabe, Zhen Ya Zhang, Michiyuki Ono, Yutaka Kitamura, Kouji Nakamura, Shigeaki Yoshida, Hideyuki Shigemori, Toshiaki Nakajima-Kambe, Yingnan Yang, Kosumi Yamada, Motoo Utsumi, Nakao Nomura, Akira Kikuchi, Makoto Kawase	生命産業科学の各専門領域に関する実験、調査、データ解析手法を具体的事例に即して習得させ、博士論文作成の指導を行う。	
02AP002	Special Research in Bioindustrial Sciences II	3	6.0	1 - 3	Annual	by request		Kazuo Watanabe, Zhen Ya Zhang, Michiyuki Ono, Yutaka Kitamura, Kouji Nakamura, Shigeaki Yoshida, Hideyuki Shigemori, Toshiaki Nakajima-Kambe, Yingnan Yang, Kosumi Yamada, Motoo Utsumi, Nakao Nomura, Akira Kikuchi, Makoto Kawase	生命産業科学の各専門領域に関する実験、調査、データ解析手法を具体的事例に即して習得させ、博士論文作成の指導を行う。	
02AP003	Advanced Bioindustrial Science	1	2.0	1	SprAB	Thu7, 8	2L501	Kazuo Watanabe, Makoto Kawase, Kouji Nakamura, Mito Kokawa	Omnibus topics will be given but those are related on life science industry. Participatory discussion is made to enhance active learning.	(教員追加予定) 主専攻必修科目。

ELECTIVE REQUIRED UNITS

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
02AP012	Transfer of Industrial Technique on Life Science	1	2.0	1, 2	Annual	by appointment		Kouji Nakamura	多岐な生命産業分野での動植物・遺伝資源を有効に活用したバイオ科学技術を産業に移転する方法、施策、条約を紹介する。また実例を挙げて論じる。	Open in an even number year.

ELECTIVE MAJOR UNITS

Course Number	Course Name	Course Type	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
02AP101	Plant Biotechnology Seminar A	2	2.0	1 - 3	Annual	by appointment		Michiyuki Ono	遺伝子組換え植物、ゲノム編集植物、植物-微生物共生などの解析をテーマとして、実験・観察し、分子生物学、生化学、分子遺伝学の基礎的な実験手法を習得する。	

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02AP102	Plant Biotechnology Seminar B	2	2.0	1 - 3	Annual	by appointment		Michiyuki Ono	This course is designed to help students gain a better understanding of the technique transfer from basic life science to applicable industry. Specialists on the rules on technique transfer are invited to give detailed information between domestic foreign regulation and successful technique transfer will be exemplified	
02AP103	Plant Biotechnology Seminar C	2	2.0	1 - 3	Annual	by appointment		Michiyuki Ono	3年次を対象に、植物の発生・分化を司る遺伝的ネットワークについて、特定の生理現象を対象とした学説を構築するための、遺伝資源としての産業利用をするための、高度な思考能力を養う。	
02AP106	Bioprocess Engineering Seminar A	2	2.0	1 - 3	Annual	by appointment		Nakao Nomura	微生物や動物細胞を用いた生理活性物質の生産プロセスおよび生物学的、物理化学的手法を用いた湖沼、養殖場の水質保全・修復プロセスについて最近の研究論文を講読・解説すると共に、討論を通じてプロセス開発の進め方を教授する。	
02AP107	Bioprocess Engineering Seminar B	2	2.0	1 - 3	Annual	by appointment		Nakao Nomura	微生物や動物細胞を用いた生理活性物質の生産プロセスおよび生物学的、物理化学的手法を用いた湖沼、養殖場の水質保全・修復プロセスについて最近の研究論文を講読・解説すると共に、討論を通じてプロセス開発の進め方を教授する。	
02AP108	Bioprocess Engineering Seminar C	2	2.0	1 - 3	Annual	by appointment		Nakao Nomura	微生物や動物細胞を用いた生理活性物質の生産プロセスおよび生物学的、物理化学的手法を用いた湖沼、養殖場の水質保全・修復プロセスについて最近の研究論文を講読・解説すると共に、討論を通じてプロセス開発の進め方を教授する。	
02AP109	Genome Biology Seminar A	2	2.0	1 - 3	Annual	by appointment		Kouji Nakamura	ゲノム構造の全体像と転写・翻訳・翻訳後修飾など、ゲノム機能の発現と繊細な制御の仕組みについて最近の研究論文を講読・解説すると共に、討論を通じて、当該分野で生み出された遺伝子資源の開発研究の進め方を議論する。	
02AP110	Genome Biology Seminar B	2	2.0	1 - 3	Annual	by appointment		Kouji Nakamura	ゲノム構造の全体像と転写・翻訳・翻訳後修飾など、ゲノム機能の発現と繊細な制御の仕組みについて最近の研究論文を講読・解説すると共に、討論を通じて、当該分野で生み出された遺伝子資源の開発研究の進め方を議論する。	
02AP111	Genome Biology Seminar C	2	2.0	1 - 3	Annual	by appointment		Kouji Nakamura	ゲノム構造の全体像と転写・翻訳・翻訳後修飾など、ゲノム機能の発現と繊細な制御の仕組みについて最近の研究論文を講読・解説すると共に、討論を通じて、当該分野で生み出された遺伝子資源の開発研究の進め方を議論する。	
02AP115	Seminar on Agrobiodiversity A	2	2.0	1	Annual	by appointment		Makoto Kawase	1年次を対象に、食料農業遺伝資源のためのジーンバンクの整備・運営のために必要な多様性の解析と効率的な保全・利活用について、内外の先端的な研究論文などを講読し、相互に討論を行う。これを通して専門性の強化とプレゼンテーション能力の向上を図る。	研究室 要望があれば英語で 授業
02AP116	Seminar on Agrobiodiversity B	2	2.0	2	Annual	by appointment		Makoto Kawase	2年次を対象に、食料農業遺伝資源のためのジーンバンクの整備・運営のために必要な多様性の解析と効率的な保全・利活用について、内外の先端的な研究論文などを講読し、相互に討論を行う。これを通して専門性の強化とプレゼンテーション能力の向上を図る。	研究室 要望があれば英語で 授業
02AP117	Seminar on Agrobiodiversity C	2	2.0	3	Annual	by appointment		Makoto Kawase	3年次を対象に、食料農業遺伝資源のためのジーンバンクの整備・運営のために必要な多様性の解析と効率的な保全・利活用について、内外の先端的な研究論文などを講読し、相互に討論を行う。これを通して専門性の強化とプレゼンテーション能力の向上を図る。	研究室 要望があれば英語で 授業

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02AP202	Plant Physiology Seminar A	2	2.0	1 - 3	Annual	by appointment		Kosumi Yamada	Topics in phytohormones and bioactive substances will be discussed with laboratory members and supervisor.	
02AP203	Plant Physiology Seminar B	2	2.0	1 - 3	Annual	by appointment		Kosumi Yamada	Topics in phytohormones and bioactive substances will be discussed with laboratory members and supervisor.	
02AP204	Plant Physiology Seminar C	2	2.0	1 - 3	Annual	by appointment		Kosumi Yamada	Topics in phytohormones and bioactive substances will be discussed with laboratory members and supervisor.	
02AP205	Animal Cell Biotechnology Seminar A	2	2.0	1 - 3	Annual	by appointment		Yuzuru Ito, Akiyoshi Taniguchi	This course is designed to help students learn the methodology of animal cell biotechnology and enhance the capability of discussion. Training is also provided to enable students to establish independent thinking way on research	
02AP206	Animal Cell Biotechnology Seminar B	2	2.0	1 - 3	Annual	by appointment		Yuzuru Ito, Akiyoshi Taniguchi	This course is designed to enable students to design experiments on animal cell biotechnology and enhance the capability of discussion. Training of practical technique is also provided to enable students to make a logic approach on research	
02AP207	Animal Cell Biotechnology Seminar C	2	2.0	1 - 3	Annual	by appointment		Yuzuru Ito, Akiyoshi Taniguchi	This course is designed to enable students to solve the problems of the practical technique, training is also provided to develop an overview capability to handle the difficult technical problems on research.	
02AP208	Bioindustrial Resources	1	2.0	1 - 3	Fall IAB	Fri 3, 4	2L501	Kazuo Watanabe, Akira Kikuchi, Taichi Oguchi	バイオ産業の基幹資源となる生物・遺伝資源について、生命科学的な観点から基礎的事項及び産業利用について論じる。また、遺伝資源の保全や産業利用について政策、社会、経済、法律及び国際関係の観点を含め、学際的に事例研究を行う。知的所有権などの無体産物についての資源的理解も議論する。バイオ産業の研究開発において、情報、研究経費、時間、人材やインフラストラクチャーなどのクリティカルマスの資源についても議論する。	
02AP209	Bioindustrial Resources Seminar A	2	2.0	1 - 3	Annual	by appointment		Kazuo Watanabe, Taichi Oguchi	後期1年次を対象に、バイオ産業を支援する最新のバイオ科学技術の諸分野の論文を読解することによって、知見を幅広く得ることによって、自己の研究の基盤を作る。	
02AP210	Bioindustrial Resources Seminar B	2	2.0	1 - 3	Annual	by appointment		Kazuo Watanabe, Taichi Oguchi	後期2年次を対象に、バイオ産業を支援する最新のバイオ科学技術の特定分野の論文を焦点を絞り読解することによって、知見を深めることによって、自己の研究の内容を充実させる。	
02AP211	Bioindustrial Resources Seminar C	2	2.0	1 - 3	Annual	by appointment		Kazuo Watanabe, Taichi Oguchi	後期3年次を対象に、自己の研究課題と関連の深いバイオ産業を支援する最新のバイオ科学技術の論文や情報を詳細に吟味し、研究の達成のための充実を図る。	
02AP212	Bioactive Natural Products Chemistry Seminar A	2	2.0	1 - 3	Annual	by appointment		Hideyuki Shigemori	1年次を対象に、天然生理活性物質が関与する医薬品や農薬および機能性剤の開発や創製に関する内外の先端的な研究論文を購読し、討論を行う。	
02AP213	Bioactive Natural Products Chemistry Seminar B	2	2.0	1 - 3	Annual	by appointment		Hideyuki Shigemori	2年次を対象に、天然生理活性物質が関与する内外の先端的な研究論文を調査、購読、発表させ、論文読解能力とともにプレゼンテーション能力を高める。	

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02AP214	Bioactive Natural Products Chemistry Seminar C	2	2.0	1 - 3	Annual	by appointment		Hideyuki Shigemori	3年次を対象に、天然生理活性物質が関与する内外の先端的な研究論文を購読し、この分野の研究動向を幅広く理解させ、セミナー形式でプレゼンテーションを行う。これを通して、自己の研究の位置付けを明確にし、研究成果のまとめ方および学術論文を作成するための高度な思考能力を養う。	
02AP215	Industrial Microbiology and Bioresource Science Seminar A	2	2.0	1 - 3	Annual	by appointment		Toshiaki Nakajima-Kambe	Topics about industrial microbiology or microbial resources are shown every time. Students must find out some original papers about it by oneself and perform a summary, presentation.	
02AP216	Industrial Microbiology and Bioresource Science Seminar B	2	2.0	1 - 3	Annual	by appointment		Toshiaki Nakajima-Kambe	Topics about industrial microbiology or microbial resources are shown every time. Students must find out some original papers about it by oneself and perform a summary, presentation.	
02AP217	Industrial Microbiology and Bioresource Science Seminar C	2	2.0	1 - 3	Annual	by appointment		Toshiaki Nakajima-Kambe	Topics about industrial microbiology or microbial resources are shown every time. Students must find out some original papers about it by oneself and perform a summary, presentation.	
02AP218	Plant Biotechnology Seminar on Abiotic Stresses A	2	2.0	1 - 3	Annual	by appointment		Akira Kikuchi	Presentation about the abiotic tolerance in higher plants is performed, and then corresponding discussion is carried out among participants.	
02AP219	Plant Biotechnology Seminar on Abiotic Stresses B	2	2.0	1 - 3	Annual	by appointment		Akira Kikuchi	Presentation about the abiotic tolerance in higher plants is performed, and then corresponding discussion is carried out among participants.	
02AP220	Plant Biotechnology Seminar on Abiotic Stresses C	2	2.0	1 - 3	Annual	by appointment		Akira Kikuchi	Presentation about the abiotic tolerance in higher plants is performed, and then corresponding discussion is carried out among participants.	
02AP301	Bio-Environmental Control Engineering Seminar A	2	2.0	1 - 3	Annual	by appointment		Motoo Utsumi	1年次生を対象に、生物圏環境制御工学分野における基本的課題に関する著書、学術論文などを購読し、論理的思考力を養い、専門知識の深化を図る。	
02AP302	Bio-Environmental Control Engineering Seminar B	2	2.0	1 - 3	Annual	by appointment		Motoo Utsumi	2年次生を対象に、生物圏環境制御工学関連分野における応用的著書、学術論文などを購読し、それらと自己の研究課題を関連づけ、評価し得る総合的思考力を養う。	
02AP303	Bio-Environmental Control Engineering Seminar C	2	2.0	1 - 3	Annual	by appointment		Motoo Utsumi	3年次生を対象に、生物圏環境制御工学分野における各自の研究内容を俯瞰的な視点から客観的に評価しうる能力の向上を図り、より高度な専門知識の修得を目指す。	
02AP304	Eco-System Engineering Seminar A	2	2.0	1 - 3	Annual	by appointment		Zhen Ya Zhang	Intended for first year students and focuses on reading scientific papers. To nurture the students capable of thinking scientifically and logically, this course intends to guide the first-year students how to read scientific papers typically related with the field of ecological and environmental engineering systems. Followed-up discussion with respect to advanced technologies in practice are also included.	

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02AP305	Eco-System Engineering Seminar B	2	2.0	1 - 3	Annual	by appointment		Zhen Ya Zhang	Intended for second year students to develop the ability to learn and expand the research issues pertaining to eco-system engineering. Also involves application of research ideas into practical sense. Followed-up discussion with respect to advanced technologies in practice are also included.	
02AP306	Eco-System Engineering Seminar C	2	2.0	1 - 3	Annual	by appointment		Zhen Ya Zhang	Intended for third year students. It focuses on developing research skills and advanced thinking, with special training pertaining to summarization of results obtained. Followed-up discussion with respect to advanced technologies in practice are also included.	
02AP404	Food System Seminar A	2	2.0	1 - 3	Annual	by appointment		Yutaka Kitamura, Mito Kokawa	With a focus on original papers, variety of research areas related to food Systems Science (agricultural engineering, food engineering, agriculture facility studies, etc.) to understand and learn the basic research methods are studied to clarify the significance and the direction of the research.	
02AP405	Food System Seminar B	2	2.0	1 - 3	Annual	by appointment		Yutaka Kitamura, Mito Kokawa	Understand and master the research methods and reveal direction of significance and research by using English materials, mainly on the variety of research areas related to food Systems Science (Post harvest technology, Food engineering, Agricultural structure, etc.)	
02AP406	Food System Seminar C	2	2.0	1 - 3	Annual	by appointment		Yutaka Kitamura, Mito Kokawa	Commentary of the latest paper on mainly studies of a variety of research areas related to food systems science (such as agricultural engineering, food engineering, agriculture structure science) and the proposal of future challenges by evaluation of important information with understanding the background.	
02AP407	Biological and Material Cycles Engineering A	2	2.0	1 - 3	Annual	by appointment	2L503	Yingnan Yang	Intended for first year students and focuses on reading scientific papers pertaining to the field of Biological and materials cycle. It also includes discussion of advanced technologies in order to cultivate the ability to apply them in practical sense.	
02AP408	Biological and Material Cycles Engineering B	2	2.0	1 - 3	Annual	by appointment	2L503	Yingnan Yang	Intended for second year students to develop the ability to learn and expand the research issues pertaining to Biological materials cycle. Also involves application of research ideas into practical sense.	
02AP409	Biological and Material Cycles Engineering C	2	2.0	1 - 3	Annual	by appointment	2L503	Yingnan Yang	Intended for third year students. It focuses on developing research skills and advanced thinking, with special training pertaining to summarization of results obtained.	
02AP601	Enzymatic Processes Seminar A	2	2.0	1 - 3	Annual	by appointment		Shigeki Yoshida	バイオ産業の基盤となる酵素反応の解析と酵素利用技術、工業用酵素とその性質、反応機構等に関する論文の紹介と解説・討論を通じて、学際的な専門知識の修得を目指す。	

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02AP602	Enzymatic Processes Seminar B	2	2.0	1 - 3	Annual	by appointment		Shigeki Yoshida	バイオ産業の基盤となる酵素反応の解析と酵素利用技術, 工業用酵素とその性質, 反応機構等に関する論文の紹介と解説・討論を通じて, 学際的な専門知識の修得を目指す。	
02AP603	Enzymatic Processes Seminar C	2	2.0	1 - 3	Annual	by appointment		Shigeki Yoshida	バイオ産業の基盤となる酵素反応の解析と酵素利用技術, 工業用酵素とその性質, 反応機構等に関する論文の紹介と解説・討論を通じて, 学際的な専門知識の修得を目指す。	