



PROSPECTUS

Faculty of Agricultural Technology

Universitas Brawijaya



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Universitas Brawijaya

Profile

Universitas Brawijaya (UB) was founded in 1961 in the urban setting of the medium-sized city of Malang (population range of 500,000-1,000,000 inhabitants), East Java, Indonesia, which is well known for its mild climate surrounded by mountains. The University was named after the king of Majapahit Empire, “Brawijaya”, granted by the first president of Indonesia, Ir. Soekarno. The University then became a state university with six faculties on January 5th, 1963.

Today, UB is one of the leading universities in Indonesia with more than 60,000 students enrolled in various degree programs, from diploma to doctorate. UB houses 15 faculties which administer a total of 143 study programs. UB study programs are well supported by the strong cooperation with the government, private sectors, and other organizations. Currently, UB maintains a network of more than 500 national institutions and around 100 foreign universities, cooperating in education, research and community development. To realize UB envisions as a world-class entrepreneurial university, several programs have been established, including the establishment of double degree program, the use of information technology to support teaching and learning activities, improvement of lab facilities, implementation of ISO quality management systems, and development of business enterprises. Recently, UB has a 554 hectares of educational forests, and translational research for the development of commercial products.



“A” Grade

by BAN-PT (National
Accreditation Organization)



**TOP 8 College
in Indonesia 2020**

by Ministry Of
Education and Culture



271-280

QS World Rank
In Asia 2020



UB is ranked 290+ in ASIA, climbing up from the previous year rank of 301+, and is ranked 800+, globally, based on QS World University Ranking in 2017. Based on UI Green Metric ranking in 2017, UB ranked the 7th in Indonesia, while on Global level, UB was on the 100+. In early 2019, UB was ranked 6th in Indonesia and the 1500+ globally, based on Webometrics World University ranking. Based on the 4 International Colleges & Universitie (4ICU) world university ranking in 2019, UB was the 2nd in Indonesia, going upward, from the previous year’s rank on the 4th. Based on Times Higher Education (THE) World University Rankings for period of 2020, UB’s position is the 2nd in Indonesia.

Internationally, UB is certified by the Alliance of Business Education and Scholarship for tomorrow (ABEST21-JAPAN) for its Faculty of Economics and Business and the Institute of Food Technologists (IFTUSA) for its Food Science and Technology Study Program. In Addition, 6 study programs are certified by ASEAN UNIVERSITY NETWORK QA QUALITY ASSURANCE (AUN-QA).

Faculty of **Agricultural Technology** Profile

Faculty of Agricultural Technology (FAT) is one out of 16 Faculties within Universitas Brawijaya, Malang. With more than 20 years experiences, FAT had produced qualified graduates, scientific works, and community services. Most of our graduates work or had become an entrepreneur in many sectors including agriculture, food industries and other agricultural product-related industries, and education, both at national and international levels.

Motto

“Do the best, toward Perfection”

Vision

Becoming an outstanding Faculty in the area of Agricultural Technology and being recognized in the international level and contributing to the national development through University's Tridharma (education, research and community service).

Mission

- 1 Implementing an educational process to produce an outstanding graduates in the field of Agricultural Science and Technology, who is having a good character, entrepreneurial spirit and global competitiveness
- 2 Conducting research and development of Agricultural Science and Technology to foster agro-industrial advance and contributing to solve global issues
- 3 Disseminating Agricultural Science and Technology for community's welfare and forming a strong network with the stakeholders in the national and international level







Message From The **Dean**



Welcome to the Faculty of Agricultural Technology (FAT) at the Universitas Brawijaya, Malang, Indonesia. I would like to highlight that it is not only Indonesia but the world has also been challenged by food and nutrition security as well as energy security issues. It is our obligation as scientists, researchers and innovators to contribute towards addressing those issues. Therefore, advancements in agricultural technology for sustainable food productions while considering environmental issues, is of great importance.

FAT is one of the largest faculties in the field of agricultural technology in East Java, Indonesia. With 3 (three) Departments and 11 (eleven) Study Programs, we offer you a remarkable opportunity to feed the world and to help the community through food science and environmental-related technology.

FAT has a great reputation due to an extraordinary achievements in the national and international levels. Those achievements are contributed mostly by the students and staff indicating the potential and quality of human resources as well as learning process.

We are committed to be a part of world class University. Therefore we continue in developing a high standard research and education facilities as well as establishing relationships with alumni, partners, and stakeholders. Our faculty and staff are also dedicated to bringing you a high quality education by providing state of the art of teaching and research.

If you are interested to be part of us, or are seeking an opportunity for further collaboration and partnership, or you want to connect with us and support us, we encourage you to browse more information on this website.

Malang, January 2021
Dean,

Prof. Dr. Ir. Imam Santoso, MP

History and Location

Faculty of Agricultural Technology (FAT) provides the educational system with a focus on agroindustry. In 1998, FAT was established, with the spirit guides how to educate students on campus to expand the technological base and the innovation capacity for agro-industeial development with the goal on enhancing the quality of life.

FAT offers comprehensive undergraduate and graduate programs that prepare students for leadership positions in industry, academia, and government. With 3 departments and 11 study programs, our education area and research programs are designed to expand understanding of food science and technology, biotechnology, industrial management, agricultural engineering, food security, sustainable energy, environmental engineering, artificial intelligence, innovation and entrepreneurship



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Educational Program

Faculty of Agricultural Technology have 3 (three) Departments and 11 (eleven) Study Programs managed by the Faculty as listed below.



Department of Agricultural Product Technology

Study Program :

- 1 Food Technology (*Undergraduate Program*)
- 2 Biotechnology (*Undergraduate Program*)
- 3 Agricultural Product Technology (*Postgraduate Master Program*)
- 4 Food Science (*Postgraduate Doctoral Program*)

Department of Agricultural Engineering

Study Program:

- 1 Agricultural and Biosystem Engineering (*Undergraduate Program*)
- 2 Environmental Engineering (*Undergraduate Program*)
- 3 Bioprocess Engineering (*Undergraduate Program*)
- 4 Agricultural and Biosystem Engineering (*Postgraduate Master Program*)



Department of Agroindustrial Technology

Study Program:

- 1 Agroindustrial Engineering (*Undergraduate Program*)
- 2 Agroindustrial Engineering (*Postgraduate Master Program*)
- 3 Agroindustrial Engineering (*Postgraduate Doctoral Program*)



Educational **System**

The undergraduate program in our faculty need to accomplish 144 credits within 4 (four) years.

- (1) Small Group Discussion
- (2) Role-Play & Simulation
- (3) Case Study
- (4) Discovery Learning (DL)
- (5) Self-Directed Learning (SDL)
- (6) Cooperative Learning (CL)
- (7) Collaborative Learning (CbL)
- (8) Contextual Instruction (CI)
- (9) Project Based Learning (PjBL)
- (10) Problem Based Learning and Inquiry (PBL)
- (11) E- Learning
- (12) Smart Class



International Programs and Mutual Cooperation

The vision of FAT UB is to be known and recognized at the international level. Therefore, FTP UB designs various international activities by involving partners from various universities or research institutes abroad. The international programs are as follows:



Visiting Professor

This program is intended to increase students' international insight, both undergraduate, postgraduate, and doctoral levels through lectures with foreign lecturers from partners abroad. Several overseas lecturers who have given lectures at FTP are from Avinashillingam University for Women, India; Birmingham City University - UK; University of the Philippines Los Banos; Northwest Samar State University Philippines; Nueva Vizcaya State University Bayombong, the Philippines; Kyungpook National University, South Korea; Director of Advanced Membrane Technology Research Center (AMTEC); and Prince of Songkla University, Thailand; University of Queensland University, Australia; University of Kentucky, USA; King Mongkut's University of Technology Thonburi,

University of Warwick, UK; University Putra Malaysia, Malaysia Mientrung University, Vietnam, Miyazaki University, Japan, Tohoku University, Japan and Catholic University of Daegu, South Korea, International Islamic University of Malaysia, Kyungpook National University, Korea; Rajamangala University of Technology Lanna, Thailand; and others.



3 in 1 Program

One of the ways to increase students' international insight is by holding lectures in the form of a 3 in one program. The 3 in one program is a program initiated by Brawijaya University in which the learning of the instructor course is not only lecturers in UB, but a combination of foreign lecturers and practitioners who are competent in their fields. Through this program, it is hoped that the quality of learning in the academic field can improve. In addition, the 3 in One program also carries out research collaboration, joint supervision and writing of joint journal publications. Some academics who have collaborated in the 3 in 1 program are from Oklahoma State University, USA; Universität für Bodenkultur Wien, Vienna, Austria; International Islamic University of Malaysia; Kasetsart University, Thailand; Petronas Technology University, Malaysia; Tohoku University, Japan; Universiti Putra Malaysia; Annamalai University, India; Hankyong National University; Thailand (KMUTT), University of Western Australia, Australia; University of Nottingham, Malaysia and Birgham Young University USA. Industry practitioner partners who have collaborated in the 3 in 1 program are PT Sorini Agro Asia

Corporindo; PT Indolakto; PT Lord Indonesia, PT Kurita Indonesia; PT Sinar Mas Agro-Resource and Technology (SMART); PT Wilmar Nabati Indonesia; PT Eka Timur Raya; PT Mayora and PT Biofarma; PT Suntory Garuda Beverage; and others.

Student Exchange

Student exchange activities are aimed at increasing students' international insight through learning exchange programs and cross-cultural interactions. Student exchange in the form of inbound and outbound programs, namely sending FAT UB students abroad for outbound and accepting foreign students at FAT UB for inbound programs. The outbound program that has been carried out in collaboration with Rajamanggala University Thailand of Lanna (RMUTL); Kyungpook National University, Korea; Universiti Putra Malaysia, International Islamic University of Malaysia, and Miyazaki University, Japan. The inbound program involves partner universities, namely Rajamanggala University of Technology of Lanna (RMUTL), Thailand; Yamaguchi University, Japan; Universiti Putra Malaysia; Universiti Technology Petronas, Malaysia; and others.

International Class

International class is a joint class in one subject held by FAT UB with partner universities abroad. The international class that has been held is the BRIC Program, namely Brawijaya - RMUTL International Class in collaboration with Rajamangala University of Technology of Lanna, Thailand.

Double Degree

This program is an educational program for undergraduate and master programs, namely lectures in part at FAT UB and some in foreign partners. Students who take part in this program will get two diplomas from UB and partner universities. The Double Degree program that is already running is with the National Pingtung University of Science and Technology (NPUST) Taiwan.

Credit Transfer

This program is in the form of lectures for 1-2 semesters at partner universities abroad for the appropriate courses. The program that has been held is in collaboration with Kwangwoon University, South Korea.

Distance Learning

This program is aimed at broadening students' horizons through talks with lecturers from abroad using IT facilities. Qualifications are carried out in smart classes designed for the implementation of remote lectures. Lectures that have involved distance learning have been conducted in all three departments with lecturers from the University of South Australia; Prince of Songkla University, Thailand; RMUTL Thailand, and IIUM Malaysia; Monash University; Australia; and NPUST.

Joint Research Students

FAT UB also collaborates with several universities abroad in the framework of student research for the final project. The universities that have collaborated are Kyungpook National University, South Korea and IIUM Malaysia.

Short Course Program

This program is intended to increase international interaction between students and staff at FAT UB. This program is a program with a short duration with a specific topic according to the existing science in FAT UB. Participants of this program are foreign students or staff and students and staff from Indonesia.

International Seminar

Every year FAT UB holds international seminars with international product with Scopus indexed. The seminar was the International Conference on Green Agroindustry and Bioeconomy (ICGAB), The 6th Agricultural Engineering Annual Regional Convention 2020 (6th ARC 2020) International seminars are also held in collaboration with other universities abroad.





International Collaboration

International collaborations have been initiated with several foreign universities in the form of research collaborations and joint publications such as the University of Warwick, United Kingdom; University of Southampton, United Kingdom; Birmingham City University, United Kingdom; Yamaguchi University, Japan; Osaka University, Japan and Jeju National University, South Korea; Avinashilingam Institute for Home Science and Higher Education for Women, Rajamangala University Technology, Lanna (RMUTL) Thailand; Mae Fah Luang University, Thailand; Universiti Teknologi Mara, UTP (Universiti Teknologi Petronas), Malaysia; NPUST, Taiwan; The University of Queensland, Australia; University of Miyazaki, Yamaguchi University, Japan; Universität für Bodenkultur Wien, University of Natural Resources and Life Sciences, Austria; Wageningen University, Germany; Korean National University (KNU), South Korea; and others.

Other Mutual Cooperation

The staff at FAT UB are also active in collaborating with industry as what has been done is research collaboration with PT Etos Agro Cira Inovasi, PT Sorini Asia Cprporindo Tbk, PT Ice Cream Campina Industry, PT Cheil Jeddang, PT Mioridairy Indo Produk, and others. Also collaboration for practice Fieldwork and Internships for Thesis, among others, with PT Indolakto and PT So Good. Other collaborations that have been undertaken are with research institutions such as the Indonesian Sugar Plantation Research Center, Indonesian Oil Palm Research Institute (IOPRA) , BATB, BPPT, Balitbangprov, and LIPI.



Strengthening Student Competencies

Industrial Guest Lecture

To bring students' competence and insight closer to the application of their knowledge in the food industry, FAT UB routinely holds guest lectures with lecturers from industry practitioners. Several industries involved in guest lectures include PT Ajinomoto Indonesia, PT Molindo Raya Industrial, PT Cheil Jedang Indonesia, PT Indolakto, PT Greenfield Indonesia, PT. Unilever, PT Sasa Inti, PT Wings Surya, PT Sorini Agro Asia Corporindo, PT Indolakto, PT Amerta Indah Otsuka, PT Japfa Food; PT Aneka Tuna Indonesia, PT Lauan Natural Krimerindo, PT Santos, and others.

Competency Training

Competency training is carried out to improve the competence of students by the Student Association, Department, and Faculty. The training is carried out in collaboration with several training institutions or institutions such as the Indonesia Halal Training and Education Center (IHATEC) LP POM MUI, PT TUV Rheinland Indonesia, and Evisafe Global Training, MK Training, and others.

Certification Training

Competency certification is held in collaboration with Professional Certification Bodies with the aim of ensuring that graduates from FAT are competent in terms of being tested for their competence.

Recognition

Lecturers and students of FAT UB have shown outstanding achievements and received recognition both nationally and internationally. The recognition of FAT lecturers is also quite well known as evidenced by the many lecturers who have been invited as resource persons from government and private agencies, as reviewers of accredited national and international journals, as well as keynotees and invited speakers in national and international seminars.

Lecturer

Some of the achievements of FAT UB lecturers include being recipients of the SEARCA Professorial Chair Award from The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) Academic Year 2019/2020 (Prof. Dr. Teti Estiasih, STP, MP); Sinta Award for Most Productive Inventor Category II from Kemenristek Dikti Year 2019 (Prof. Dr. Teti Estiasih, STP, MP); Honorable Mention Paper Award in The Third International Conference of Agricultural Engineering (CIGR) (2012) (Yusuf Hendrawan, PhD); Outstanding Contribution Award in The Third International Conference of Agricultural Engineering (CIGR) (2012) (Yusuf Hendrawan, PhD); Information and Electrical Technologies Select Paper Award (2011) (Yusuf Hendrawan, PhD); and The Crawford Fund Award, The Crawford Fund, Food for a

Secure World (2015) (Wenny Bekti Sunarharum, PhD), Research Funding from Kurita Water and Environment Foundation 2016 (Yusuf Wibisono), TWAS Comstech Research Grant (2018), Research grant through the Royal Academy of Engineering's Industry Academia Partnership Program - Newton Fund (2019 - 2020) (Sri Suhartini), The University of Warwick Research England GCRF Accelerator Fund (Irnia Nurika, PhD), Erasmus (2019-2022) (Irnia Nurika) and others.

Other achievements of FAT lecturers are as the Top 10 National Achievement Lecturers (2016) (Yusuf Hendrawan, PhD); 1st Winner of UB Lecturer Achievement (2016) (Yusuf Hendrawan, PhD); An Inspirational Alumni Award-Australian Alumni Award from the Australian Embassy, Indonesia (2010) (Wenny Bekti

Sunarharum, PhD); The Prime Minister's Australia Asia Endeavor Award, Endeavor Awards (2012) (Wenny Bekti Sunarharum, PhD); The Prime Minister's Australia Asia Endeavor Award, Endeavor Awards (2014) (Arif Hidayat, PhD); Best Development Practices and Policies in Food Security Award (co-author), State Ministry Ministry of National Development Planning (BAPPENAS) Indonesia (2015) (Wenny Bekti Sunarharum, PhD); Hadi Soesastro Prize, Australia Awards, by Minister for Foreign Affairs, The Hon Julie Bishop (2015) (Wenny Bekti Sunarharum, PhD); Lecturer with Achievement I UB (2018) (Prof. Dr. Ir. Simon Bambang Widjarnako, MAppSc.); Academic Leader I UB (Prof. Dr. Teti Estiasih, STP, MP); Head of Study Program I UB (Mas'ud Effendi, STP, MP), and 3rd place for outstanding lecturers at Universitas Brawijaya (Dr. Ir. Joni Kusnadi, M.Si.

Academic Staff

The educational staff at FAT also showed good achievements, namely as the 2nd Winner of UB 2016 Achievement Laboratory Assistant (Yuli Ernawati, AMd), 1st Winner of UB 2018 Achievement Laboratory Assistant (Luluk Mamluhah, SSi), and Laboratory Assistant Achievement Award I UB (2020) Supriyono, SP.



Students

Students of FAT are very active in various activities and show extraordinary achievements, at the national and international level as listed below:

2018:

- 1 Best presenter in The 15th Hokkaido Indonesia Student Association Scientific Meeting, Hokkaido University, Japan
- 2 Gold medal in Indonesia International Invention Festival (I3F), Polinema and UB, Indonesia, 2018
- 3 Gold medal in International Festival of Innovation on Green Technology, Universitas Malaysia Pahang, Malaysia, 2018
- 4 Gold and silver medal in International Research Innovation, Invention, and Solution Expotion, University of Malaya, Malaysia, 2018
- 5 The most outstanding delegate in Asia World Model United Nation, South Korea, 2018
- 6 Three gold medals in International Invention and Innovation Competition, Mediate Nexus and Nuture a Fast (MNNF) Network, Malaysia, 2018
- 7 Gold medal in Busan Choral Festival and Competition, Korea Choral Institute, South Korea, 2018
- 8 Best oral presentation, best commercial content, and best overall project in IU FoST (19th World Congress of Food Science and Technology), India
- 9 Best paper science in UI YEA (Universitas Indonesia Youth Environmental Action), Indonesia, 2018
- 10 Three gold medals and four bronze medals in National scientific event (PIMNAS 31), Universitas Negeri Yogyakarta, Indonesia, 2018
- 11 Two silver medals in International Food Innovation and Product Development, Universiti Teknologi MARA Shah Alam, Malaysia, 2018
- 12 Third place in Designing The Future as an Entrepreneur, Malaysian Global Innovation and Creativity Center MAGIC and Studec, Malaysia, 2018
- 13 Third place in International Biotechnology Competition and Exhibition, Bioprocess Engineering Student Society, Universiti Teknologi Malaysia, 2018
- 14 Bronze medal in World Young Inventors Exhibition, Malaysia, 2018
- 15 Third place in Tokyo Tech Indonesia Commitment Award (TICA), Tokyo Institute of Technology, Japan, 2018

2019:

- 16 Two gold medals and a silver medal in Indonesia International Invention Festival, Ma Chung University, Indonesia, 2019
- 17 Gold medal and Bronze medal in International Invention, and Innovation Competition (InIIC), Malaysia, 2019
- 18 Gold medal, silver medal, bronze medal in Korea International Women Invention, South Korea, 2019
- 19 Best presentation, best paper, best poster, the winner of EXPO YSIS (Implementation Technology), the winner of EXPO YSIS (Society Empowerment), Young Scientist International Seminar and Expo, Universitas Brawijaya, Indonesia, 2019
- 20 Gold medal, IYSA special award, leading innovation award in World Invention Competition and Exhibition (WICE), Malaysia, 2019
- 21 Best paper and the most outstanding delegate in Brawijaya United Nation, Indonesia, 2019
- 22 Best position paper of OPEC and the most outstanding delegate of OPEC, Udayana Bali Model United Nation, Indonesia, 2019
- 23 Two gold medals and a silver medal in International Invention and Innovation Competition (InIIC) series 2, MNNF Network, Malaysia, 2019
- 24 Gold medal in 10th International Innovation and Invention Competition (IIIC), Chinese Innovation and Invention Society, Taiwan, 2019
- 25 Two gold medals in International symposium and essay competition, Universitas Brawijaya, Indonesia, 2019
- 26 Gold medal, three silver medals, and two bronze medals in National Scientific Event (PIMNAS), Indonesia, 2019
- 27 Second place in IDEANATION, Indonesia, 2019
- 28 Silver medal in Advanced Innovation Global Competition (AIGC), Singapore, 2019
- 29 Second place in 5th International Biotechnology Competition and Exhibition, UTM, Malaysia, 2019
- 30 Bronze medal in Bangkok International Intellectual Property, Invention, Innovation, and Technology Exposition, NRCT, Thailand, 2019
- 31 Bronze medal in International Malaysia Technology Expo, Malaysia, 2019
- 32 Bronze medal in International Innovation and Design, Universiti Teknologi MARA, Malaysia, 2019

2020:

- 33 Three gold medals, ten silver medals, and seven bronze medals in International paper competition, 2020
- 34 Two gold medals, two silver medals, and a bronze medal in International poster competition, 2020
- 35 Three gold medals and four silver medals in International video competition, 2020
- 36 Best presenter in the ICGAB 2020, Universitas Brawijaya, Indonesia, 2020
- 37 Gold medal in The SEAFast Indofood Food Product Development Competition, IPB, Indonesia, 2020
- 38 Best essay in the 9th Industrial Engineering Competition (IECOM), ITB, Indonesia, 2020
- 39 Best presentation paper competition, Agricultural Engineering Week, UGM, 2020
- 40 First winner in Business Plan Competition, Festival Nasional Wirausaha Muda Udayana, Indonesia, 2020
- 41 Second place in Business plan Pekan Ilmiah Perbanas, 2020
- 42 Second winner in Agriculture and Ecologist Competition (AE-COM), IPB, 2020
- 43 Third place in National Folklore Festival Universitas Indonesia, 2020



Department of Agricultural Product Technology

Undergraduate Program

1. Food Technology

Food Technology study program has been accredited “A” by The National Accreditation Board for Higher Education (BAN-PT) and internationally accredited by the IFT (Institute of Food Technologists), America since 2012. The main competencies of FST are 5 competencies based on the IFT Undergraduate Education Standards, i.e. Food Chemistry and Analysis, Food Microbiology and Safety, Food Process Engineering, Applied Food Science, and Success Skills. The curriculum is comprehensively established covering 5 domains of competence with a minimum of 144 credits within 8 semesters (4 years). The implementation of teaching and learning process involves many researchers and industry experts or professionals as an effort to improve student competency.

Scientific specifications provided include understanding on agricultural products as biological materials, knowledge on the major processes in converting biological materials into products or commodities, knowledge on processing tools and machines, ability to evaluate issues regarding commodity processing aspects, ability to innovate or to create new products, and ability to operate processing unit, to run and to optimize the system.

Competencies:

Food Tehnology's curriculum is designed to meet the competency requirements of the Institute of Food Technologist (IFT). IFT also recommends 44 learning achievements as core competencies. The minimum competencies required for students based on IFT are:

1. Food Chemistry and Analysis
2. Food Microbiology and Safety
3. Food Process Engineering
4. Applied Food Science
5. Success Skills

Intended Learning Outcomes (ILOs)

- 1 Understand the chemical, biochemical, and physical properties of food ingredients and the reactions that affect the quality of food products.
- 2 Able to apply Physics, Chemistry, Biology, Mathematics and Engineering in the operating system and processing of food and agricultural products to produce value-added, quality and safe products.
- 3 Understand the principles and techniques of food analysis and be able to apply them in testing the quality of food products.
- 4 Understand the context of harmful and detrimental microbes and be able to use and control them in food management.
- 5 Able to control physical damage, chemical damage, biochemical and biological food products during storage.
- 6 Able to apply physical, chemical, biochemical, bioassay testing techniques, microbiological and sensory for evaluation of quality and food safety.
- 7 Able to apply the principles of quality assurance and control related to the Industry including Good Manufacturing Practices (GMP), HACCP, TQM and ISO series.
- 8 Able to communicate in teams and work together effectively in the framework of agro-industrial development
- 9 Able to think logically and analytically to solve problems.
- 10 Have skills in utilizing the latest information and communication technology.
- 11 Able to express ideas clearly in oral and written form.
- 12 Have a high sense of nationality and social care.
- 13 Able to work independently and in groups.
- 14 Able to be a learner who always follows and adjust to the progress and development of science and technology.





2. Biotechnology

The Bachelor of Biotechnology Study Program at Universitas Brawijaya is an undergraduate education program that focuses on industrial biotechnology. Industrial biotechnology (white biotechnology) is a scientific discipline that becomes the target competency of the graduates of this Biotechnology study program. The competency covers science that studies the utilization of living things (bacteria, fungi, viruses, etc.) as well as products derived from living things (enzymes, etc.) in the production process of goods and services on an industrial scale. Biotechnology is currently a new economic wave that will become a world economic power, so that mastering industrial biotechnology is expected to be useful to revitalize the existing industries in Indonesia while increasing competitiveness internationally. Biotechnology study program is established to produce competent human resource in the field of biotechnology who is able to develop biological natural resources into high-value bio-based products. The knowledge can be applied in the fields of food, health, agriculture, environment and energy. The program was founded in 2014 with the following vision, mission, and objectives:

Vision

To become a science and technology development center that produces globally competitive human resources in the field of industrial biotechnology.

Mission

- 1 To provide quality education program in industrial biotechnology that can compete nationally and internationally.
- 2 To perform research in industrial biotechnology that produces useful products for human welfare.
- 3 To conduct diffusion of science and technology to the community in the face of the bioeconomic era.

Objectives

- 1 To produce quality human resources in industrial biotechnology.
- 2 To produce quality research in the form of scientific publications and intellectual property rights (IPs) that are beneficial for the development of industrial biotechnology at the national and international level.
- 3 To take an active role in the diffusion of science and technology related to the development of industrial biotechnology.

Program Learning Outcomes (PLOs)

Graduates of the program will:

- 1 Have the knowledge of and technical skills in industrial biotechnology and the ability to use these competencies to address industrial biotechnology problems in a wide range of industries including (but not limited to) food, feed, pharmaceutical, chemical, material, and energy industries.
- 2 Have professional aptitude: the ability to communicate effectively, work in teams, and lead under pressure; uphold professionalism ethics; and be responsible.
- 3 Have the ability to develop oneself into a lifelong learner to face future challenges.

Intended Learning Outcomes (ILOs)

The ILOs of the Biotechnology Study Program are structured into four general outcomes (Greek numbering: I–IV). The knowledge and skill proficiencies (described in numbers II and III) are further divided into sub-categories with alphabetic and Arabic numbering. Note that this numbering system will be used in the course-ILO matrix.

Students of the program will:

- 1 Have acquired the foundational knowledge of mathematics and the natural sciences and understand their relevance to industrial biotechnology.
- 2 Have acquired the theoretical and applied concepts of industrial biomass-to-bioproducts conversion (through physical, chemical, and biological processes) that supports the realization of a sustainable green bioeconomy.
- 3 Have acquired technical knowledge and demonstrate proficiency in skills that support work in industrial biotechnology.
- 4 Demonstrate the aptitude for a lifelong professional and personal development.



Postgraduate Program

1. Agricultural Product Technology (Master Degree)

Master degree program of Agricultural Product Technology offers interdisciplinary applied science learning programs that focus on the development of agricultural technology to produce research as well as qualified master graduates. This postgraduate master program provides in depth study on the fundamentals of science related to the handling and processing of food and agricultural products, such as chemistry and biochemistry, engineering and processing, nutrition, microbiology and biotechnology. The graduates are expected to be a pioneer in the community in solving problems related to the development of Agricultural Product Technology in the community, especially in the industrial sectors.

Competencies

- 1 Able to develop food science and technology and agricultural product technology which includes the field of physics, chemistry, biochemistry, microbiological aspects of food products, and agricultural products, health, nutrition as well as applied food science
- 2 Able to update the development of science in accordance with their expertise

2. Food Science (Doctoral Degree)

Doctoral degree program of Food Science in FAT is a research-oriented education program (by research). However, to conduct a qualified research, mastering of theory or specific knowledge is required to support dissertation or research. This postgraduate doctoral program requires students to enrol on 12 credit hours of courses (research supporting courses). This is to provide the provision of research, so the courses offered are can support the dissertation or research. This program provides five choices of fields i.e. Food Chemistry and Biochemistry, Food Engineering and Processing, Food Microbiology, Food Nutrition, and Sensory and Applied Food Science, but does not rule out inter-related possibilities namely. The total credits that need to be taken to complete this doctoral program in food science is a minimum of 42 credits than can be accomplished within 6 semesters.

Doctoral of Food Science graduates are expected to have the following competencies:

- 1 Able to develop science and technology in the field of food processing through research to produce creative, innovative and original work.
- 2 Able to solve problems of science, technology in the field of food and agricultural products through an interdisciplinary approach
- 3 Able to develop research and apply it for the benefit of the stakeholders and to obtain national and international recognition.
- 4 Mastering the concepts and theories of food science and other related fields of science so that they can have a role as expert researchers, academics, expert practitioners, or professionals with capability and reliability in applying and developing food science.

Department of Agricultural Product Technology has been accredited by :



Department of Agroindustrial Technology

Undergraduate Program

Agroindustrial Engineering

In 1998, the Faculty of Agricultural Technology, Universitas Brawijaya (FAT UB) established the Department of Agroindustrial Technology (based on the Decision Letter of General Directorate of Higher Education of Indonesia No. 1103/DIKTI/Kep/1998) to support the development of the agricultural sector, especially of agroindustrial technology. The department manages four laboratories: Laboratory of Agrochemical Technology, Laboratory of Bioindustry, Laboratory of Agroindustrial Management, and Laboratory of Computation and System Analysis.

The Bachelor program of Agroindustrial Engineering focuses on strengthening the agroindustry in each pillar, which includes technology, management, and systems engineering. These three pillars are the scientific basis for the study program. The bachelor program of Agroindustrial Engineering has received A certificate of accreditation from the National Accreditation Agency of Higher Education. It had also received international recognition from AUN-QA (ASEAN University Network-Quality Assurance) in 2016.



Independent Professional Profile (Learning Outcome):

- 1 Become agroindustrial engineers who are able to apply system engineering, process engineering, management engineering and information technology in designing, carrying out and evaluating smart-green agroindustry.
- 2 Become technopreneurs who are able to manage and develop product innovation and business of local culture-based green agroindustry.
- 3 Become professionals with leader character, having global perspective and passion for learning and able to work in multidisciplinary and/or
- 4 multicultural team.
Become individual with integrity, fighting spirit, adaptability, communicative and innovative ability and cognitive flexibility.

Program Learning Outcomes (PLO):

- 1 Able to identify, formulate, analyze and solve agroindustrial problems by applying mathematics, natural and materials science as well as information technology to obtain comprehensive understanding covering system engineering, process engineering and engineering management.
- 2 Able to design system components, system, process, and/or product to fulfill the needs of realistic obstacles by applying methods, skills and modern engineering tools in the practice of local culture and global perspective-based smart-green agroindustry.
- 3 Able to design and carry out laboratory and/or field experiment and able to analyze and interpret the data of engineering perspective.
- 4 Able to work in multidisciplinary and multicultural team, build networks and to effectively communicate both in writing and verbally.
- 5 Able to be responsible to society and comply with the ethics and professionalism to identify, solve and evaluate industrial engineering problems and become proactive towards current issues.
- 6 Having awareness on the importance of lifelong learning.
- 7 Able to apply technopreneurship principles in business of creative-sustainable agroindustry.

Postgraduate Program

Agroindustrial Engineering (Master Degree)

The Master Program in Agroindustrial Engineering (AE) prepares students with academic abilities, to be able to apply, and develop aspects of systems engineering, process engineering, and engineering management in the agro-industry field. The curriculum for the Masters Program AE can be completed at least 4 semesters and a maximum of 8 semesters with 40-45 credits consisting of 16 credits of compulsory courses, 12-16 credits of elective courses, and 12 credits of thesis. The Master Program AE is expected to produce graduates according to the level 8 Indonesian National Qualifications Framework (INQF) with the following competencies:

Knowledge Competencies

- 1 Able to design and develop scientific process engineering, engineering management, and system engineering in the smart and sustainable agroindustrial field.
- 2 Able to develop research, innovation, standardization and dissemination of agroindustrial activities so as to generate a tested and competitive innovative work.
- 3 Able to solve problems and make decisions and strategic policies through an interdisciplinary or multidisciplinary approach in an environmentally-friendly and sustainable agroindustrial system.
- 4 Able to develop roadmap-based research with an inter or multidisciplinary approach, both independently and in collaboration with other institutions.
- 5 Able to develop wider networks with colleagues, users and the agroindustrial community.



Specific Skills

- 1 Able to design, develop and implement solutions of the agroindustrial problems through systems engineering approaches and engineering management for technopreneurship development in agroindustry.
- 2 Able to design, develop and develop the recent process engineering that is efficient, value added and competitive in the agroindustry sector.

Agroindustrial Engineering (Doctoral Degree)

Doctoral Program of Agroindustrial Engineering allows the students to choose their courses in supporting their dissertation. This program requires minimum 42 credits to complete, which are divided into 12 credits for one semester, 30 credits for Dissertation consisting of a) 1 credit for qualifying examination; b) 2 credits for proposal examination; c) 18 credits for research and research result seminar; d) 4 credits for the first and second international scientific article publications 1 and 2; e) 5 credits for dissertation writing and dissertation examination.



The graduates of this program shall attain level 9 competencies, according to the Indonesian National Qualification Framework (IQF):

General Skills

- 1 Mastering the philosophy and theory of agro-industrial technology science with the field of process technology studies, including production process optimization techniques, performance analysis of tools and machines, and development of new competitive products.
- 2 Mastering the philosophy and theory of agro-industrial technology science with the field of process technology studies, including production process optimization techniques, performance analysis of tools and machines, and development of new competitive products.
- 3 Mastering the philosophy and theory of agro-industrial technology science with the field of systems engineering studies, including supply chain analysis and agro-industrial system integration.
- 4 Mastering the philosophy and theory of Agroindustrial Engineering and Biosystem science with fields including Agricultural Cultivation Mechanical Engineering, Soil and Water Engineering, Agricultural Mechanization Systems and Management, Food and Agricultural Product Processing Techniques, Agricultural Energy and Electrification, Agricultural Environment and Buildings, and Agricultural Ergonomics and Electronics.
- 5 Able to plan and develop sustainable agro-industrial downstream
- 6 Able to make innovations and their applications in the agro-industrial system.
- 7 Able to plan and evaluate the agro-industry quality system comprehensively.
- 8 Able to analyze problems and develop agro-industry policy strategies from upstream to downstream aspects.
- 9 Able to design and develop innovative agricultural tools and machines integrated in the field of food processing and agricultural products.

- 10 Able to analyze and explore the application of waste treatment technology to achieve environmentally sound agro-industry business.
- 11 Able to design and develop a smart farming system based on information technology and control systems.
- 12 Able to explore renewable energy to support the achievement of environmentally friendly agro-industries.

Specific Skills

- 1 Able to produce novelty, innovative, tested and original scientific works in the field of agro-industrial technology, especially in the fields of technology, management, and agro-industrial systems engineering and can be published on a national and / or international scale.
- 2 Able to produce novelty, innovative, tested and original scientific work in the field of Agroindustrial Engineering and Biosystem, especially in fields including Agricultural Cultivation Mechanical Engineering, Soil and Water Engineering, Agricultural Mechanization Systems and Management, Food Processing and Agricultural Products Engineering, Energy and Electrification of Agriculture, Environment and Agricultural Buildings as well as Agricultural Ergonomics and Electronics through independent research activities with inter, intra, multi or trans disciplinary approaches and can be published on a national and / or international scale
- 3 Able to solve problems and take strategic decisions and policies within the scope of the agro-industrial system so as to provide results and have an impact on improving performance, sustainability and competitiveness of agro-industry
- 4 Able to plan, manage, lead, implement and develop a research road map in the field of agricultural industrial technology that is beneficial to stakeholders of the agro-industrial system.



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Department of Agricultural Engineering

Undergraduate Program

1. Agricultural and Biosystem Engineering

The Agricultural and Biosystem Engineering Study Program was established in 1963 under the Faculty of Agriculture, Universitas Brawijaya. In 1998, it was established under the Faculty of Agricultural Technology until nowadays. The education and learning process in this study program covers engineering and biosystem sciences such as thermodynamics, fluid mechanics, strength of materials, engineering drawing, designing agricultural machinery, physical properties of agricultural materials and post-harvest technology. This study program also provides learning subjects about how to utilize agricultural materials and products, as well as renewable energy, by emphasizing the engineering aspect of agricultural machinery, agricultural buildings, environmental control, agricultural production systems and food and agricultural products processing. In Addition, the study program offers managerial aspect including managerial ability to organize, develop and implement new technologies, long-term planning and strategic planning from the aspects of agricultural engineering. The undergraduate program of Agricultural Engineering had received an “A” accreditation from The National Accreditation Board for Higher Education (BAN-PT) and had achieved Asean University Network-Quality Assurance (AUN-QA) Certification.



Competencies

- 1 An ability to use engineering principles in designing technology products related to the field of agricultural engineering science.
- 2 Having an attitude, creative and innovative thinking in working with consistently follow professional ethics.
- 3 An ability to manage and utilize natural resources (agriculture and environment) and the supporting resources (human resources, infrastructure, etc.) in an optimal way and sustainable.

- 4 Having an attitudes and professional behavior as well as having strong leadership and the ability in scientific communication effectively.
- 5 An ability to identify, formulating, analyzing and solving problems in the field of agricultural engineering through systems approach.
- 6 An ability to conduct research, explore, develop and apply science and technology in the field of agricultural engineering science.
- 7 An ability to develop and manage entrepreneurship oriented to agribusiness and agroindustry.

2. Environmental Engineering



The Environmental Engineering Study Program was developed from the Interest in Natural Resources and Environmental Engineering, which was originally named Land and Water Engineering, in the Department of Biosystem and Agricultural Engineering, Faculty of Agricultural Technology. This interest has existed since the formation of the Agricultural Engineering Study Program in 1984. The interest in Natural Resources and Environmental Engineering had officially became an Environmental Engineering Study Program in 2014 and was awarded an "A" accreditation from The National Accreditation Board for Higher Education (BAN-PT) in 2016.

Competencies

- 1 Able to apply mathematics, natural science, information technology and basic engineering to achieve understanding in the field of environmental engineering
- 2 Able to design system, component or process based on mass and energy balance, substance transmission in air, water and soil in sustainable manner
- 3 Able to design and conduct laboratory/field experiment, analyse and interpret data in the field of environmental engineering and management
- 4 Able to demonstrate an expertise in the field of environmental engineering and management, as well as entrepreneurship based on the consideration of risk assessment, uncertainty, sustainability, and environmental impact
- 5 Able to demonstrate good attitude and compliance to professional ethics in institution, organisation and society related to environmental engineering area
- 6 Able to deliver knowledge in oral and written manner, in both national and international environment
- 7 Able to work within interdisciplinary team and culture
- 8 Able to identify, formulate, review literature, analyse and solve the problem that is within environmental engineering scope
- 9 Able to utilise methods, skills, and modern apparatus that is required in the field of environmental engineering
- 10 Able to comprehend the necessity of life-long learning, including the access to relevant and recent issues

3. Bioprocess Engineering

The Bioprocess Engineering Study Program (BESP) is one of the Brawijaya University leading study program with a vision to become a leader in undergraduate education and research in the field of bioprocess engineering and actively support the development and application of bioprocess industry in global competition.

We have mission in:

Organizing Bioprocess Engineering undergraduate education program professionally with international standards, and capable of producing competent graduates in the field of bioprocess engineering. Developing research in the field of bioprocess engineering for food and non-food products. Implementing research results to develop bioprocess based industries, both in small, medium and large scale enterprises.

Program Learning Outcomes (Program Education Objectives/Graduate Competence/Profile)



We are preparing our graduates for in their career and professional life, and within a few years of graduation, as follows:

- 1 (PLO-1) Graduates acquire professional leadership roles in bioprocess engineering and related fields leading to successful career (ILO-1, ILO-2, ILO-3, ILO-4, ILO-5)
- 2 (PLO-2) Graduates establish commitment and contributes toward sustainable and bio-based economy development for better society (ILO-1, ILO-2, ILO-3, ILO-7)
- 3 (PLO-3) Graduates engage in lifelong learning in conducting practical engineer tasks (ILO-4, ILO-5, ILO-6, ILO-7)

Intended Learning Outcomes (Student Learning Outcome)

On successful completion of this program, graduates will have an ability:

- 1 (ILO-1) To acquire a sound knowledge in mathematics and natural science and apply engineering principles in determining and solving contemporary and complex problems related to bioprocessing.
- 2 (ILO-2) To formulate and operate conversion processes of biological resources into bio-based value added materials related to food, feed, fuels, pharmaceutical, nutraceutical, biomaterials or biochemicals.
- 3 (ILO-3) To design biological reaction and reactors including its materials, instrumentation, control, and modeling.
- 4 (ILO-4) To communicate creative idea and works effectively within professional community and larger society.
- 5 (ILO-5) To demonstrate an ability to work in multidisciplinary and multicultural teams in developing innovative engineering solutions using complex problem-solving skills.
- 6 (ILO-6) To conduct practice-based tasks related to bioprocessing in a responsible, safe, voluntary, self-motivated and ethical manner.
- 7 (ILO-7) To appraise bioprocessing and bioproducts manufacturing and valorization using entrepreneurship principles.

Agricultural and Biosystem Engineering (Master Degree)

This study program is aimed at developing the ability to multiply cognitive abilities based on the integration of theory, research and practical (applied) experience. Graduates will have values in the form of ethical behavior and noble character, have a high analytical power, mastering natural resource-based research that has the potential to become a superior product, able to implement the results of his research for the development of environmentally sound industries in the fields of interest in Agroindustrial and Bioprocess Mechanical Engineering, Natural and Environmental Resources Engineering, and Management of Agricultural Mechanization.

Competencies

- 1 Able to understand and develop engineering sciences to be applied in the field of agro-complex systems or biosystems.
- 2 Being able to inventory, identify, analyze/evaluate, and design the process of agricultural commodities and natural resource management that is environmentally sound,
- 3 Able to carry out environmental assessments and audits as well as take preventive and mitigating actions from environmental degradation and damage resulting from agricultural industrialization.
- 4 Able to follow the development of science and technology related to the field of Agricultural and Biosystem Engineering
- 5 Able to develop knowledge, technology, and/or art in the field of Agricultural Engineering or professional practice through research, to produce innovative and tested work.
- 6 Able to solve problems of science, technology, and/or art in the field of Agricultural Engineering through inter or multidisciplinary approaches.
- 7 Able to manage research and development that is beneficial to society and science, and be able to obtain national and international recognition.

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UB Facilities



Smart Class

FAT highly prioritizes the improvement of facilities and infrastructure as well as a comfortable building policy to support lecture activities and student discussions. In addition, it is supported by complete learning facilities including a laboratory and an audio-visual room. Currently, the Faculty of Agricultural Technology already has 2 multimedia rooms that can be used as lecture rooms with advanced learning / smart classes equipped with teleconference facilities.



Building

Facilities in an educational institution are an important part that needs attention. This is because the existence of these facilities and infrastructure will support students' academic and non-academic activities and support the creation of a conducive teaching and learning process. One of the facilities that need to be equipped in a college is a lecture building.



Library

Universitas Brawijaya Library is one of the Institutional Support System which functions to support the university's academic programs which are contained in the "Three College Obligations" which includes education, research and community service. Some of the roles of libraries in supporting the educational process include providing information, coordinating and combining all forms of services to improve teaching and learning, research and public services. In the end, the goal is to achieve the process of improving the quality of graduates in terms of developing their knowledge and mastery of science. UB Library also provides Electronic Books (E-Books), International Journals in various fields of knowledge, manuals, and so on.

Website: lib.ub.ac.id



Gazebo

Apart from the existing facilities inside the building, there are also facilities outside the building, one of which is the Gazebo. Usually this place is used for discussions, casual chats, meeting events, doing assignments or reports, often even used for taking pictures with friends. The place is shady and comfortable, because this place is never empty of students, even on weekends.

FAT Facilities



Laboratory

- 1 Laboratory of Chemistry and Biochemistry of Food and Agricultural Products
- 2 Laboratory of Food and Agricultural Products Processing and Engineering
- 3 Laboratory of Food Nutrition and Agricultural Products
- 4 Laboratory of Microbiology of Food and Agricultural Products
- 5 Laboratory of Food and Agricultural Products Industry Biotechnology
- 6 Laboratory of Food Quality and Safety Testing
- 7 Laboratory of Sensory Test
- 8 Laboratory of Food and Agricultural Products Processing Engineering
- 9 Laboratory of Agricultural Power and Machinery
- 10 Laboratory of Natural Resources and Environmental Engineering
- 11 Laboratory of Mechatronics for Agro-industrial Equipment and Machinery
- 12 Laboratory of Agrochemical Technology
- 13 Laboratory of Bioindustry
- 14 Laboratory of Computation and System Analysis
- 15 Laboratory of Agroindustry Management
- 16 Laboratory of Pilot Plant
- 17 Laboratory of Basic Practicum
- 18 Laboratory of Entrepreneurship
- 19 Laboratory of Waste Treatment
- 20 Laboratory of Remediation
- 21 Laboratory of Bioprocess Engineering

Other Facility

- 1 Smart Class
- 2 Library
- 3 ULBI
- 4 Klinik Jurnal

Laboratory Equipment



Atomic Absorption Spectrometer (AAS)



HPLC



GC



PCR



UV Vis Spectrophotometer



DNA Elektroforensis



Camera Microscope



Tensile Strength Analyzer



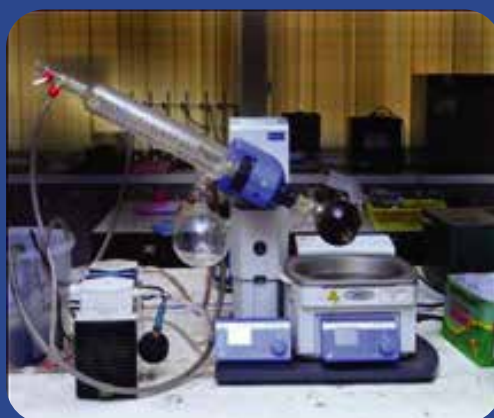
Rheometer



Deep Freezer



Haemocytometer



Rotary Evaporator



Texture Analyzer

Resource Sharing Facilities

- 1 X-Ray Diffraction (XRD) (FMIPA)
- 2 Scanning Electron Microscope (SEM)
- 3 (LSIH)
- 4 FTIR (FMIPA)
- 5 PSA (FMIPA)
- 6 LC MS MS (LSIH)
- 7 Flowcytometer (FK UB)

Food Processing Equipment

Vacuum Frying



Freeze Dryer



Oven,
Cabinet Dryer
And Processing Area

Processing Unit of Beverage Line Production





Profile And Expertise Of **Lecturers**

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